COWICHAN VALLEY STARFINDERS ASTRONOMY CLUB

Clear Skies

Volume 13, Issue 3 July 2008

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Categories

Quick Links

Greetings!

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

Clear your calendar for the clubs premier event "the Island Star Party" is coming on July 4-5. Bring the kids and camp at the top of the Malahat. See the "Upcoming Events" section for more information.

{editor correction} I mentioned in the JUNE newsletter that the monthly meetings are cancelled during the summer, well I have since found out this is not the case. Monthly meetings will continue be held every 4th Wednesday of the month. I guess that German holiday did catch up with me after all ☺. Our next meeting is scheduled for July 23rd.

We had a busy June the club hosted another "Sidewalk Astronomy" session in conjunction with the Duncan Farmers Market. Thanks to the club members Moe Ed M, Bryon T, Ed N, Nancy, Jamie and Trudy who are always willing to spend time to meet and greet the public and talk about our favourite hobby. I also heard tha Dave came by to chat for a bit and to lend his support.

We have also been busy with the media, posters have been made and placed around the valley and Bryon has been working hard trying to get the local papers and television hyped for the event. Speaking of TV, check out this weeks Shaw daily which runs on channel 4 (cable) from Wednesday 6:00pm to Thursday noon. You may spot some familiar faces who had fun doing a session on promoting the ISP. Thanks Moe and Lauren for taking part.

The AGM BBQ Social was a lot of fun and the weather held out. We had enough hotdogs and hamburgers to feed an army! Congratulations to the elected individuals for 2008-09. Detail fo the minutes are posted in the "Minutes" section.

And finally, if you have been driving the Malahat lately you will have noticed the "sign crews" work. ISP signs were set up on June 26th in order to capture the attention of the long weekend travellers. Thanks to Moe, Bryon and Paul. See the Cool Pics section for a picture of these hard working fellas.

Many thanks to this month's contributers: Moe Raven and Bryon Thompson

Freda Eckstein

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

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Meeting Highlights

Meetings are held on the **4th 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 July 23rd.
Welcome to all new members of CVSF.
Hope to see you all there.

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Minutes (AGM)

By Freda Eckstein

Cowichan Valley StarFinders Astronomy Society – 2008 Annual General Meeting (AGM) Minutes.

The Cowichan Valley StarFinders AGM meeting was held June 25th, 2008.
Members attending were:
Ed Maxfield, Brian Robilliard, Robert Deane, Moe Raven, Ralph Mattson, Gerry Rozema, Bryon Thompson and Freda Eckstein.

Review of last year's society activities:

- Meetings were moved from Serious Coffee to the CMHA (Canadian Mental Health Association)
- Held our annual Christmas
- Change of Executive in January
- Meetings were moved from CMHA to Mill Bay
- Lecturers to date: John McDonald, Bill Weller, Chris Gainor and Brad Crowden
- Hosted three Sidewalk Astronomy sessions in partnership with the Duncan Farmers Market.
- Held International astronomy celebration at the Duncan Farmers Market
- Brian, Moe and Ed offered a "private" star party session in Duncan. The club received a $100 donation from the event.

Future events planned:

- Three more Sidewalk Astronomy sessions are scheduled with the Duncan Farmers Market
- North American Indigenous Games (Aug 3-10): the club is still working out issues with regarding transportation to and from the Centre of the Universe. The club maybe involved in a limited capacity depending on the outcome of the decisions of the NAIG officials.
- Ed would like to see the club become more involved with the Nanaimo group and perhaps participate in future projects together.

Finances:

Current Balance: $1,433.65
Most of the funds will go toward hosting of the upcoming ISP. Funds will be spent on Posters, Prizes, Site Rental, Food Services, etc.

AGM Elections:

Effective September 1, 2009 the following individuals have been elected in the following positions for a one year term:

Director Positions:
President - Ed Maxfield
Vice-President - Bryon Thompson
Treasurer - Phyllis Scott
Public Outreach Officer - Bryon Thompson

Other Elected Positions:
Webmaster - Brian Robilliard
Newsletter Editor - Freda Eckstein
Secretary – Floater

For more information about upcoming meetings go to Starfinders Meetings

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Upcoming Events

July 4th - 5th – CVSF is hosting the**13th annual The Island Star Party (ISP)**

Book your holidays and bring the family to a weekend of camping and stargazing on the top of the Malahat at the Victoria Fish and Game club. It's a fun weekend open the public with participants from all over North America attending. Included are lectures, prizes, activities for the young, and many telescopes for everyone to enjoy the night sky. The fun begins on July 4th (after 4:00pm) and wraps up at 12:00pm on July 6th. Again this year your CVSF membership is included as part of your ISP ticket. What a deal! See the Island Star Party (ISP) website for more information.

July 19th - CVSF Public Outreach – Sidewalk Astronomy:

Our Club will be hosting another public outreach session complete with solar and regular telescopes and club info at the Downtown Duncan Farmers Market on Saturday July 19th between 9:00 am to 1:00 pm. Volunteers are always needed to interact with the public and provide club information. Even if you could put in an hour let us know by emailing Bryon Thompson or calling 743-2412 .

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Web News

While surfing the net, I came across this interesting service for the Astronomer who has everything.

Spaceweather PHONE is an astronomy alert service that phones you when things are happening in the sky. When auroras appear over your hometown, your phone will ring. When the space station is about to fly over your back yard, your phone will ring. Each phone call comes with a simultaneous email message, so if you miss part of your call or can't remember the details--just check your email for the full story! Refer to http://spaceweatherphone.com/ for more details.

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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".

Getting ready for the ISP (Paul, Bryon and Moe).

Also, check out our 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

RETURN TO CATEGORIES

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New Red Spot Appears on Jupiter - May 22/08 Credit Provided by University of California, Berkeley.

In what's beginning to look like a case of planetary measles, a third red spot has appeared next to its cousins — the Great Red Spot and Red Spot, Jr. — in the turbulent jovian atmosphere.

This spot, which is a fraction of the size of the two other features, lies to the west of the Great Red Spot in the same latitude band of clouds.

The new spot was previously a white, oval-shaped storm. The change to a red color indicates its swirling storm clouds are rising to heights like the clouds of the Great Red Spot. One explanation is that the red storm is so powerful, it dredges material from deep beneath Jupiter's cloud tops, and lifts it to higher altitudes. Solar ultraviolet radiation then produces the familiar brick color.

Detailed analysis of the visible-light images taken by Hubble's Wide Field Planetary Camera 2 on May 9 and 10, and near-infrared adaptive optics images taken by the Keck telescope on May 11, is revealing the relative altitudes of the cloud tops of the three red ovals. Because all three oval storms are bright in near-infrared light, they must be towering above the methane in Jupiter's atmosphere.

Storms first observed on Jupiter more than two years ago are still raging. The Hubble and Keck images also reveal the change from a rather bland, quiescent

band surrounding the Great Red Spot just over a year ago to one of incredible turbulence.

Red Spot, Jr., appeared in spring 2006. The Great Red Spot has persisted for 200 to 350 years observations. If the new red spot and the Great Red Spot continue on their courses, they will encounter each other in August, and the small oval will either be absorbed or repelled from the Great Red Spot. Red Spot, Jr. which lies between the two others at a lower latitude, will pass the Great Red Spot in June.

The Hubble and Keck images may support the idea that Jupiter is in the midst of global climate change, as first proposed in 2004 by Phil Marcus, a mechanical engineering professor at the University of California, Berkeley. The planet's temperatures may be changing by 15 to 20 degrees Fahrenheit, getting warmer near the equator and cooler near the south pole. He predicted that large changes would start in the southern hemisphere around 2006, causing the jet streams to become unstable.

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New Measurements Reveal a Slimmer Milky Way- May 25/08

Credit SDSS-II.

The Milky Way Galaxy has lost weight, a lot of weight. About a trillion Suns' worth.

It wasn't a galactic diet that accounted for the recent slimming, but a more accurate scale. This weighty discovery from the Sloan Digital Sky Survey (SDSS-II) has broad implications for our understanding of the Milky Way.

"The galaxy is slimmer than we thought," says Xiangxiang Xue of the National Astronomical Observatories of China, who led an international team of researchers. "That means it has less dark matter than previously believed, but also that it was more efficient in converting its original supply of hydrogen and helium into stars." Xue is presently pursuing a doctoral thesis at the Max Planck Institute for Astronomy (MPIA) in Heidelberg, Germany.

The discovery, accepted for publication in The Astrophysical Journal, is based on data from SEGUE, an enormous survey of stars in the Milky Way — one of the three programs that comprise SDSS-II. Using SEGUE measurements of stellar velocities in the outer Milky Way, a region known as the stellar halo, the researchers determined the mass of the Galaxy by inferring the amount of gravity required to keep the stars in orbit. Some of that gravity comes from the Milky Way stars themselves, but most of it comes from an extended distribution of invisible dark matter, whose nature is still not fully understood.

To trace the mass distribution of the Galaxy, the SEGUE team used a carefully constructed sample of 2,400 "blue horizontal branch" stars whose distances can be determined from their measured brightness. Blue horizontal branch stars can be seen to large distances, Xue explained, enabling the team to measure velocities of stars all the way out to distances of 180,000 light-years from the Sun.

The most recent previous studies of the mass of the Milky Way used mixed samples of 50 to 500 objects, notes team member Hans-Walter Rix, director of MPIA. They implied masses up to two trillion times the mass of the Sun for the total mass of the galaxy. By contrast, when the SDSS-II measurement within 180,000 light-years is corrected to a total mass measurement, it yields a value slightly under one trillion times the mass of the Sun.

"The enormous size of SEGUE gives us a huge statistical advantage," says Rix. "We can select a uniform set of tracers, and the large sample of stars allows us to calibrate our method against realistic computer simulations of the galaxy."

"The total mass of the galaxy is hard to measure because we're stuck in the middle of it," explains collaborator Timothy Beers of Michigan State University. "But it is the single most fundamental number we have to know if we want to understand how the Milky Way formed or compare it to distant galaxies that we see from the outside."

All SDSS-II observations are made from the 2.5-meter telescope at Apache Point Observatory in New Mexico. It uses a mosaic digital camera to image large areas of sky and spectrographs fed by 640 optical fibers to measure light from individual stars, galaxies, and quasars. SEGUE's stellar spectra turn flat sky maps into multi-dimensional views of the Milky Way, Beers said, by providing distances, velocities, and chemical compositions of hundreds of thousands of stars.

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NASA Plans to Visit the Sun– June 10/08 Credit Science@NASA

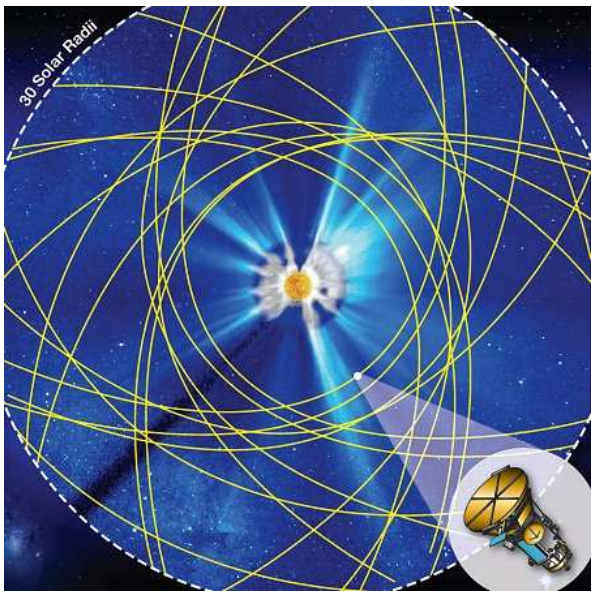
For more than 400 years, astronomers have studied the sun from afar. Now NASA has decided to go there.

"We are going to visit a living, breathing star for the first time," says program scientist Lika Guhathakurta of NASA Headquarters. "This is an unexplored region of the solar system and the possibilities for discovery are off the charts."

The name of the mission is Solar Probe+ (pronounced "Solar Probe plus"). It's a heat-resistant spacecraft designed to plunge deep into the sun's atmosphere where it can sample solar wind and magnetism first hand. Launch could happen as early as 2015. By the time the mission ends 7 years later, planners believe Solar Probe+ will solve two great mysteries of astrophysics and make many new discoveries along the way.

The probe is still in its early design phase, called "pre-phase A" at NASA headquarters, says Guhathakurta. "We have a lot of work to do, but it's very exciting." Johns Hopkins' Applied Physics Lab (APL) will design and build the spacecraft for NASA. APL already has experience sending probes toward the sun. APL's MESSENGER spacecraft completed its first flyby of the planet Mercury in January 2008 and many of the same heat-resistant technologies will fortify Solar Probe+. (Note: The mission is called Solar Probe plus because it builds on an earlier 2005 APL design called Solar Probe.)

At closest approach, Solar Probe+ will be 7 million km or 9 solar radii from the sun. There, the spacecraft's carbon-composite heat shield must withstand temperatures greater than 1400o C and survive blasts of radiation at levels not experienced by any previous spacecraft. Naturally, the probe is solar powered; it will get its electricity from liquid-cooled solar panels that can retract behind the heat-shield when sunlight becomes too intense. From these near distances, the Sun will appear 23 times wider than it does in the skies of Earth.



Right: A simulated view of the Sun illustrating the trajectory of Solar Probe+ during its multiple near-Sun passes.

The two mysteries prompting this mission are the high temperature of the sun's corona and the puzzling acceleration of the solar wind:

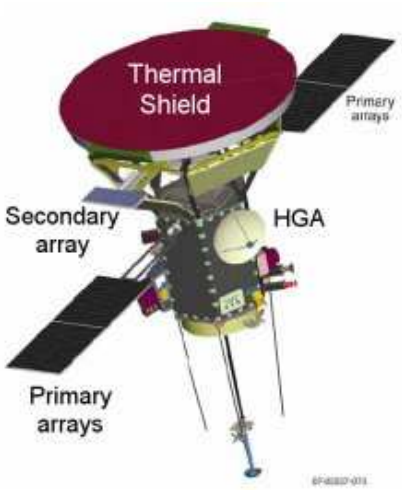
Mystery #1—the corona: If you stuck a thermometer in the surface of the sun, it would read about 6000o C. Intuition says the temperature should drop as you back away; instead, it rises. The sun's outer atmosphere, the corona, registers more than a million degrees Celsius, hundreds of times hotter than the star below. This high temperature remains

a mystery more than 60 years after it was first measured.

Mystery #2—the solar wind: The sun spews a hot, million mph wind of charged particles throughout the solar system. Planets, comets, asteroids—they all feel it. Curiously, there is no organized wind close to the sun's surface, yet out among the planets there blows a veritable gale. Somewhere in between, some unknown agent gives the solar wind its great velocity. The question is what?

"To solve these mysteries, Solar Probe+ will actually enter the corona," says Guhathakurta. "That's where the action is."

The payload consists mainly of instruments designed to sense the environment right around the spacecraft—e.g., a magnetometer, a plasma wave sensor, a dust detector, electron and ion analyzers and so on. "In-situ measurements will tell us what we need to know to unravel the physics of coronal heating and solar wind acceleration," she says.



Right: The re-designed Solar Probe+ spacecraft.

Solar Probe+'s lone remote sensing instrument is the Hemispheric Imager. The "HI" for short is a telescope that will make 3D images of the sun's corona similar to medical CAT scans. The technique, called coronal tomography, is a fundamentally new approach to solar imaging and is only possible because the photography is performed from a moving platform close to the sun, flying through coronal clouds and streamers and imaging them as it flies by and through them.

With a likely launch in May 2015, Solar Probe+ will begin its prime mission near the end of Solar Cycle 24 and finish near the predicted maximum of Solar Cycle 25 in 2022. This would allow the spacecraft to sample the corona and solar wind at many different phases of the solar cycle. It also guarantees that Solar Probe+ will experience a good number of solar storms near the end of its mission. While perilous, this is according to plan: Researchers suspect that many of the most dangerous particles produced by solar storms are energized in the corona—just where Solar Probe+ will be. Solar Probe+ may be able to observe the process in action and show researchers how to forecast Solar Energetic Particle (SEP) events that threaten the health and safety of astronauts.

Solar Probe+'s repeated plunges into the corona will be accomplished by means of Venus flybys. The spacecraft will swing by Venus seven times in six years to bend the probe's trajectory deeper and deeper into the sun's atmosphere. Bonus: Although Venus is not a primary target of the mission, astronomers may learn new things about the planet when the heavily-instrumented probe swings by. "Solar Probe+ is an extraordinary mission of exploration, discovery and deep understanding," says Guhathakurta. "We can't wait to get started."

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GLAST in Orbit! – June 11/08 Credit NASA

At 12:05 p.m. EDT, the Delta II rocket easily lifted the GLAST (Gamma-Ray Large Area Space Telescope) spacecraft off the launch pad, out of smoke and clouds and into a beautiful Florida sky headed for space. The second firing of the second-stage engine was confirmed as was successful spacecraft separation. Applause rippled through the launch control center as separation confirmation was received.

GLAST is now on its own with its solar arrays deployed and placed into a circular orbit 350 miles above the Earth, prepared to monitor the universe and the mysterious gamma-ray bursts.

GLAST is a powerful space observatory that will explore the most extreme environments in the universe, and search for signs of new laws of physics and what composes the mysterious dark matter, explain how black holes accelerate immense jets of material to nearly light speed, and help crack the mysteries of the staggeringly powerful explosions known as gamma-ray bursts.

With high sensitivity GLAST is the first imaging gamma-ray observatory to survey the entire sky every day. It will give scientists a unique opportunity to learn about the ever-changing universe at extreme energies. GLAST will detect thousands of gamma-ray sources, most of which will be supermassive black holes in the cores of distant galaxies.

GLAST: Exploring the Extreme Universe
GLAST is a powerful space observatory that will open a wide window on the universe. Gamma rays are the highest-energy form of light, and the gamma-ray sky is spectacularly different from the one we perceive with our own eyes. With a huge leap in all key capabilities, GLAST data will enable scientists to answer persistent questions across a broad range of topics, including supermassive black-hole systems, pulsars, the origin of cosmic rays, and searches for signals of new physics.

The mission is an astrophysics and particle physics partnership, developed by NASA in collaboration with the U.S. Department of Energy, along with important contributions from academic institutions and partners in France, Germany, Italy, Japan, Sweden, and the U.S.

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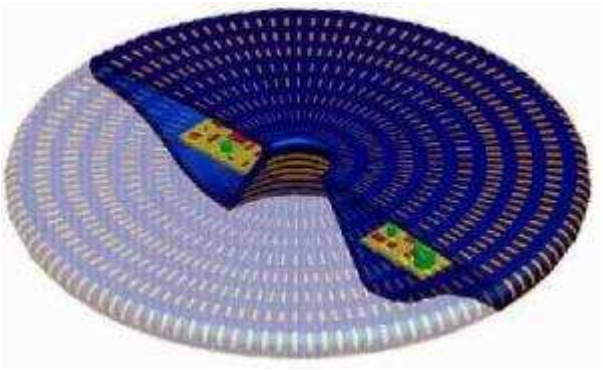
Professor Designs Plasma-propelled Flying Saucer– June 12/08
Credit ScienceDaily

Flying saucers may soon be more fact than mere science fiction. University of Florida mechanical and aerospace engineering associate professor Subrata Roy has submitted a patent application for a circular, spinning aircraft design reminiscent of the spaceships seen in countless Hollywood films. Roy, however, calls his design a "wingless electromagnetic air vehicle," or WEAV.

The proposed prototype is small – the aircraft will measure less than six inches across – and will be efficient enough to be powered by on-board batteries.

Cut-away illustration of proposed prototype mini-flying saucer. (Credit: Image courtesy of University of Florida)



Roy said the design can be scaled up and theoretically should work in a much larger form. Even in miniature, though, the design has many uses.

The most obvious functions would be surveillance and navigation. The aircraft could be designed to carry a camera and light and be controlled remotely at great distances, he said.

Fittingly, Roy said his flying saucer one day could soar through atmospheres other than Earth's own. For example, the aircraft would be an ideal vehicle for the exploration of Titan, Saturn's sixth moon, which has high air density and low gravity, Roy said.

The U.S. Air Force and NASA have expressed interest in the aircraft, and the university is seeking to license the design, he said. "This is a very novel concept, and if it's successful, it will be revolutionary," Roy said.

The vehicle will be powered by a phenomenon called magnetohydrodynamics, or the force created when a current or a magnetic field is passed through a conducting fluid. In the case of Roy's aircraft, the conducting fluid will be created by electrodes that cover each of the vehicle's surfaces and ionize the surrounding air into plasma.

The force created by passing an electrical current through this plasma pushes around the surrounding air, and that swirling air creates lift and momentum and provides stability against wind gusts. In order to maximize the area of contact between air and vehicle, Roy's design is partially hollow and continuously curved, like an electromagnetic flying bundt pan.

One of the most revolutionary aspects of Roy's use of magnetohydrodynamics is that the vehicle will have no moving parts. The lack of traditional mechanical aircraft parts, such as propellers or jet engines, should provide tremendous reliability, Roy said. Such a design also will allow the WEAV to hover and take off vertically.

Though the design is promising on paper, towering obstacles stand between the blueprint and liftoff. No plasma-propelled aircraft has successfully taken flight on Earth. Such designs have found some success in space, where gravity and drag are minimal, but a vehicle hoping to fly within Earth's atmosphere will need at least an order of magnitude more thrust, Roy said.

Also, the power source needs to be extremely lightweight yet still produce enough power to generate the necessary plasma. Not to mention the fact that the very same plasma that will allow the aircraft to fly also will interfere with electromagnetic waves necessary for communication with the vehicle.

But Roy is confident that the unique nature of his design will allow it to clear the technological hurdles and take to the skies, and he's not deterred by the risk of failure. "Of course the risk is huge, but so is the payoff," he said. "If successful, we will have an aircraft, a saucer and a helicopter all in one embodiment."

The propulsion system for Roy's saucer sprouts from his extensive U.S. Air Force-funded plasma actuator research, the results of which have appeared in more than 15 scholarly journals. The production of the aircraft will be a joint project of UF's mechanical and aerospace engineering department and its electrical and computer engineering department.

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NASA Spacecraft Reveal Largest Crater in Solar System- June 25/08 credit NASA

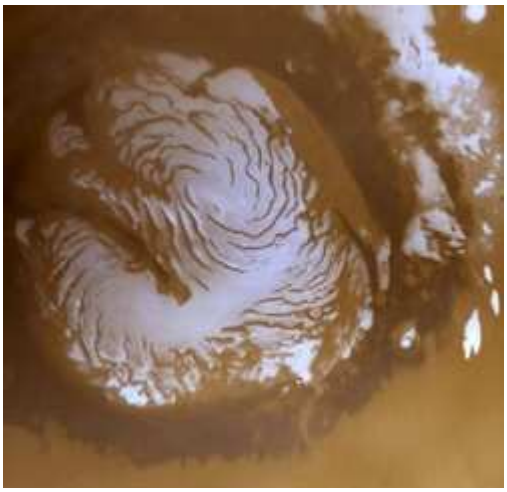
PASADENA, Calif. -- New analysis of Mars' terrain using NASA spacecraft observations reveals what appears to be by far the largest impact crater ever found in the solar system.

NASA's Mars Reconnaissance Orbiter and Mars Global Surveyor have provided detailed information about the elevations and gravity of the Red Planet's northern and southern hemispheres. A new study using this information may solve one of the biggest remaining mysteries in the solar system: why does Mars have two strikingly different kinds of terrain in its northern and southern hemispheres? The huge crater is creating intense scientific interest.

The mystery of the two-faced nature of Mars has perplexed scientists since the first comprehensive images of the surface were beamed home by NASA spacecraft in the 1970s. The main hypotheses have been an ancient impact or some internal process related to the planet's molten subsurface layers. The impact idea, proposed in 1984, fell into disfavor because the basin's shape didn't seem to fit the expected round shape for a crater. The newer data is convincing some experts who doubted the impact scenario.

"We haven't proved the giant-impact hypothesis, but I think we've shifted the tide," said Jeffrey Andrews-Hanna, a postdoctoral researcher at the Massachusetts Institute of Technology in Cambridge.

Andrews-Hanna and co-authors Maria Zuber of MIT and Bruce Banerdt of NASA's Jet Propulsion Laboratory in Pasadena, Calif., report the new findings in the journal Nature this week. A giant northern basin that covers about 40 percent of Mars' surface, sometimes called the Borealis basin, is the remains of a colossal impact early in the solar system's formation, the new analysis suggests. At 5,300 miles across, it is about four times wider than the next-biggest impact basin known, the Hellas basin on southern Mars. An accompanying report calculates that the impacting object that produced the Borealis basin must have been about 1,200 miles across. That's larger than Pluto.



This wide-angle view shows the martian north pole during early summer in the northern hemisphere. The north polar cap is roughly 680 miles across. The band of dark material surrounding the cap consists mainly of wind-shaped sand dunes. NASA/JPL/Malin Space Science Systems

"This is an impressive result that has implications not only for the evolution of early Mars, but also for early Earth's formation," said Michael Meyer, the Mars chief scientist at NASA Headquarters in Washington.

This northern-hemisphere basin on Mars is one of the smoothest surfaces found in the solar system. The southern hemisphere is high, rough, heavily cratered terrain, which ranges from 2.5 to 5 miles higher in elevation than the basin floor.

Other giant impact basins have been discovered that are elliptical rather than circular. But it took a complex analysis of the Martian surface from NASA's two Mars orbiters to reveal the clear elliptical shape of Borealis basin, which is consistent with being an impact crater.

One complicating factor in revealing the elliptical shape of the basin was that after the time of the impact, which must have been at least 3.9 billion years ago,

giant volcanoes formed along one part of the basin rim and created a huge region of high, rough terrain that obscures the basin's outlines. It took a combination of gravity data, which tend to reveal underlying structure, with data on current surface elevations to reconstruct a map of Mars elevations as they existed before the volcanoes erupted.

"In addition to the elliptical boundary of the basin, there are signs of a possible second, outer ring - a typical characteristic of large impact basins," Banerdt said.

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Phoenix Mars Lander Returns Treasure Trove for Science– June 27/08 Credit ScienceDaily

NASA's Phoenix Mars Lander performed its first wet chemistry experiment on Martian soil flawlessly yesterday, returning a wealth of data that for Phoenix scientists was like winning the lottery.

This image shows a microscopic view of fine-grained material at the tip of the Robotic Arm scoop aboard NASA's Phoenix Mars Lander on June 20, 2008. The image shows small clumps of fine, fluffy, red soil particles. (Credit: NASA/JPL-Caltech/University of Arizona/Max Planck Institute)

"We are awash in chemistry data," said Michael Hecht of NASA's Jet Propulsion Laboratory, lead scientist for the Microscopy, Electrochemistry and Conductivity Analyzer, or MECA, instrument on Phoenix. "We're trying to understand what is the chemistry of wet soil on Mars, what's dissolved in it, how acidic or alkaline it is. With the results we received from Phoenix yesterday, we could begin to tell what aspects of the soil might support life."

"This is the first wet-chemical analysis ever done on Mars or any planet, other than Earth," said Phoenix co-investigator Sam Kounaves of Tufts University, science lead for the wet chemistry investigation. About 80 percent of Phoenix's first, two-day wet chemistry experiment is now complete. Phoenix has three more wet-chemistry cells for use later in the mission.

"This soil appears to be a close analog to surface soils found in the upper dry valleys in Antarctica," Kouvanes said. "The alkalinity of the soil at this location is definitely striking. At this specific location, one-inch into the surface layer, the soil is very basic, with a pH of between eight and nine. We also found a variety of components of salts that we haven't had time to analyze and identify yet, but that include magnesium, sodium, potassium and chloride."

"This is more evidence for water because salts are there. We also found a reasonable number of nutrients, or chemicals needed by life as we know it," Kounaves said. "Over time, I've come to the conclusion that the amazing thing about Mars is not that it's an alien world, but that in many aspects, like mineralogy, it's very much like Earth."

Another analytical Phoenix instrument, the Thermal and Evolved-Gas Analyzer (TEGA), has baked its first soil sample to 1,000 degrees Celsius (1,800 degrees Fahrenheit). Never before has a soil sample from another world been baked to such high heat.

TEGA scientists have begun analyzing the gases released at a range of temperatures to identify the chemical make-up of soil and ice. Analysis is a complicated, weeks-long process. But "the scientific data coming out of the instrument have been just spectacular," said Phoenix co-investigator William Boynton of the University of Arizona, lead TEGA scientist. "At this point, we can say that the soil has clearly interacted with water in the past. We don't know whether

that interaction occurred in this particular area in the northern polar region, or whether it might have happened elsewhere and blown up to this area as dust."

Leslie Tamppari, the Phoenix project scientist from JPL, tallied what Phoenix has accomplished during the first 30 Martian days of its mission, and outlined future plans. The Stereo Surface Imager has by now completed about 55 percent of its three-color, 360-degree panorama of the Phoenix landing site, Tamppari said. Phoenix has analyzed two samples in its optical microscope as well as first samples in both TEGA and the wet chemistry laboratory. Phoenix has been collecting information daily on clouds, dust, winds, temperatures and pressures in the atmosphere, as well as taking first nighttime atmospheric measurements.

Lander cameras confirmed that white chunks exposed during trench digging were frozen water ice because they sublimated, or vaporized, over a few days. The Phoenix robotic arm dug and sampled, and will continue to dig and sample, at the 'Snow White' trench in the center of a polygon in the polygonal terrain.

"We believe this is the best place for creating a profile of the surface from the top down to the anticipated icy layer," Tamppari said. "This is the plan we wanted to do when we proposed the mission many years ago. We wanted a place just like this where we could sample the soil down to the possible ice layer."

The Phoenix mission is led by Peter Smith of The University of Arizona with project management at JPL and development partnership at Lockheed Martin, located in Denver. International contributions come from the Canadian Space Agency; the University of Neuchatel, Switzerland; the universities of Copenhagen and Aarhus, Denmark; Max Planck Institute, Germany; and the Finnish Meteorological Institute.

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Asteroid-hunting Satellite A World First – June 27/08 Credit ScienceDaily

Canada is building the world's first space telescope designed to detect and track asteroids as well as satellites. Called NEOSSat (Near Earth Object Surveillance Satellite), this spacecraft will provide a significant improvement in surveillance of asteroids that pose a collision hazard with Earth and innovative technologies for tracking satellites in orbit high above our planet.

Weighing in at a mere 65-kilograms, this dual-use $12-million mission builds upon Canada's expertise in compact "microsatellite" design. NEOSSat will be the size of a large suitcase, and is cost-effective because of its small size and ability to "piggyback" on the launch of other spacecraft. The mission is funded by Defence Research Development Canada(DRDC) and the Canadian Space Agency(CSA). Together CSA and DRDC formed a Joint Project Office to manage the NEOSSat design, construction and launch phases. NEOSSat is expected to be launched into space in 2010. The two projects that will use NEOSSat are HEOSS (High Earth Orbit Space Surveillance) and the NESS (Near Earth Space Surveillance) asteroid search program.

NEOSSat is the first follow up mission to the groundbreaking MOST (Microvariability and Oscillation of STars) spacecraft, a 60-kilogram satellite designed to measure the age of stars in our galaxy. NEOSSat also marks the first project using Canada's Multi-Mission Microsatellite Bus. CSA's Space Technology branch launched the Multi-Mission Bus project to capitalize on technology developed for the MOST project by making it adaptable to future satellite missions.

Dr. Brad Wallace leads the science team at DRDC for HEOSS, which will use NEOSSat for traffic control of Earth's high orbit satellites. Dr. Wallace says, "We have already done satellite tracking tests using MOST, so we know that a microsatellite can track satellites. The challenge now is to demonstrate that it can be done efficiently, reliably, and to the standards required to maximize the safety of the spacecraft that everyone uses daily, like weather and communication satellites."

The HEOSS project will demonstrate how a microsatellite could contribute to the

Space Surveillance Network (SSN), a network of ground based telescopes and radars located around the world. Until the 1980s, Canada contributed to the SSN with two ground-based telescopes in eastern and western Canada. The fact that HEOSS will be a space-based capability on a microsatellite represents an exciting enhancement to the contribution and offers significant advantages to the SSN. Ground-based sensors' tracking opportunities are constrained by their geographic location and the day-night cycle. In Sun-synchronous orbit around our planet, NEOSSat will offer continuous tracking opportunities and the ability to track satellites in a wide variety of orbit locations.

"NEOSSat requires remarkable agility and pointing stability that has never before been achieved by a microsatellite," says David Cooper, General Manager of Mississauga-based Dynacon Inc., the prime contractor for the NEOSSat spacecraft and the manufacturer and operator of the MOST satellite. "It must rapidly spin to point at new locations hundreds of times per day, each time screeching to a halt to hold rock steady on a distant target, or precisely track a satellite along its orbit, and image-on-the-run." Cooper says. "Dynacon is the world leader in this microsatellite attitude-control-system technology."

Dr. Alan Hildebrand, holder of a Canada Research Chair in Planetary Science in the University of Calgary's Department of Geoscience, leads an international science team for the NESS asteroid search project and is excited by its prospects. "NEOSSat being on-orbit will give us terrific skies for observing 24-hours a day, guaranteed," Hildebrand says. "Keeping up with the amount of data streaming back to us will be a challenge, but it will provide us with an unprecedented view of space encompassing Earth's orbit."

Although NEOSSat's 15-centimetre telescope is smaller than most amateur astronomers', its location approximately 700 kilometres above Earth's atmosphere will give it a huge advantage in searching the blackness of space for faint signs of moving asteroids. Twisting and turning hundreds of times each day, orbiting from pole to pole every 50 minutes, and generating power from the Sun, NEOSSat will send dozens of images to the ground each time it passes over Canada. Due to the ultra-low sky background provided by the vacuum of space, NEOSSat will be able to detect asteroids delivering as few as 50 photons of light in a 100-second exposure.

Hildebrand, who oversees the U of C's ground-based asteroid observation program using the Rothney Astrophysical Observatory's wide-field Baker Nunn telescope, said NEOSSat will greatly enhance the study of asteroids and comets as they approach Earth. "NEOSSat will discover many asteroids much faster than can be done from the ground alone. Its most exciting result, however, will probably be discovering new targets for exploration by both manned and unmanned space missions," he observes. "By looking along Earth's orbit, NEOSSat will find 'low and slow' asteroids before they pass by our planet and sprint missions could be launched to explore them when they are in the vicinity of the Earth." The public can follow the NEOSSat mission and individuals can express support and enthusiasm for asteroid-searching by having their name launched into space aboard the spacecraft by visiting the mission's website http://www.neossat.ca

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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.

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.

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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 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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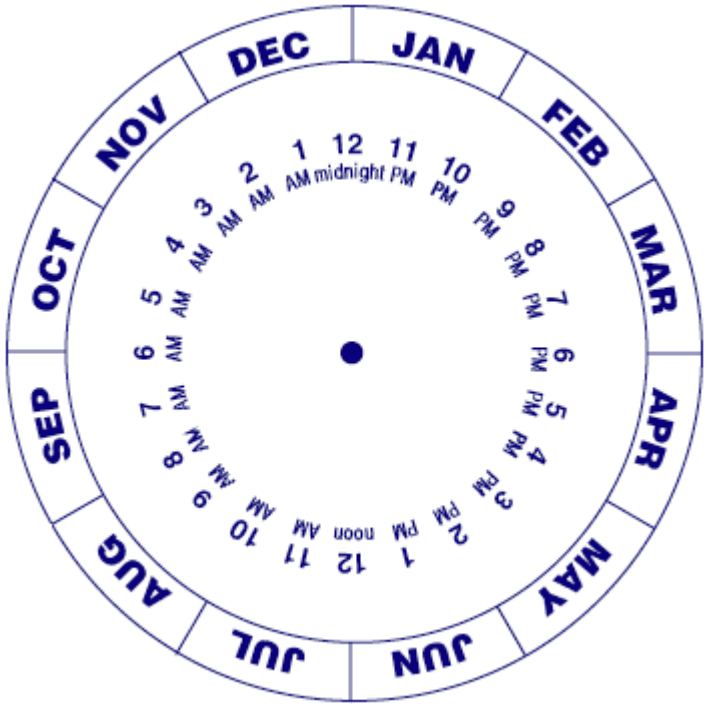
Kids Korner

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.

Last month you received instructions on how to make a Sky Wheel which helps you to find constellations of stars and other things in the sky. This month (again courtesy of LHS Hands-On Universe project) you can make a Star Clock which helps you tell the time by looking at the night sky. Two perfect tools to get ready for the Island Star Party.

Make Your Own Star Clock
Print this page from browser and cut out the circles below. If you don't have a printer, try drawing your own star clock by copying the images below.



Cut the notch on the smaller (blue) circle.

Place the small circle on top of the large circle. Push a large paper faster to make a center hole through both circles and spread open the fastener on the backside of the Star Clock or poke a hole through the circles with a pencil then thread a string or thin rubber band through the hole and knot it on both sides.

Using the Star Clock

- Find the Big Dipper and the North Star, as shown on the face of your Star Clock.
- Face the North Star, as shown on the front of the clock.
- Find the current month around the outside circle of the Star Clock. Put your thumb over the current month. Hold your Star Clock so the current month, marked by your thumb is AT THE TOP.
- Holding the large disc firmly with the current month at the top, turn the smaller disc until its stars line up with those in the sky.
- Read the time in the window.

If you are on Daylight Savings Time, add one hour.

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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.

Star Party

The RASCALS Star Party is August 29th to 31st. Mark your calendars

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The Sky This Month

By Bryon Thompson

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

Almost all the planets in the night sky this month are skirting close to the horizon. You will need clear skies to the west to see most of them. Jupiter is by far the best of these. Jupiter reaches opposition on July 9th at magnitude -2.7. It is low in the Eastern side of Sagittarius and as such will not appear at its best; the reflected light has to travel through thicker atmosphere. Jupiter's four large moons Io, Eurpoa, Callisto and Ganymede present changing views as well. All the moons cast shadows on Jupiter's cloud tops but Io's two day orbital period makes its shadow noticeably race across the face of the big planet. Europa's orbital period is a little longer than Io's and Callisto's is eight days while Ganymede's is fourteen days.

Venus sets one half hour after the sun at the beginning of the month and one half hour later than that by the end of July and is too low for telescopes.
Mars, although higher in the sky than Venus, lies low in the west in Leo at magnitude 1.7. With a clear view to the western horizon you should be able to see Mars, Saturn and Regulus all within 5 degrees of each other earl y in July. The group will only be approximately 18 degrees above the horizon or the distance of 2 fists held at arm's length.

This month is your last chance to spot Saturn low in the west as it edges ever closer to the setting sun. It will continue its sunward journey disappearing in the solar glare and reappearing in the early fall mornings with its rings even more edge on than they appear now. By the end of the year they will seem to disappear as the earth lines up with the plane of the big planets rings.

Neptune best viewed after midnight can be found shining at magnitude 7.9 in Cappricornus. Use a sky chart to find 42, 44 and 45 Cappricornii. The "blue star" that forms a triangle with the last pair is the planet Neptune. See if you can detect the slight bluish cast of this most distant of the true planets, (according to the new definitions).

Mercury is our early July morning star it reaches its greatest western elongation angle July 1 and shines at .4 magnitude. Mercury rises about 3:40 am local time. It will reach approximately 22 degrees altitude on the first of the month. Because it rises a little later each day, by the end of July it will reach superior conjunction (when an inferior planet lines up on the far side of the sun) and disappear from view.

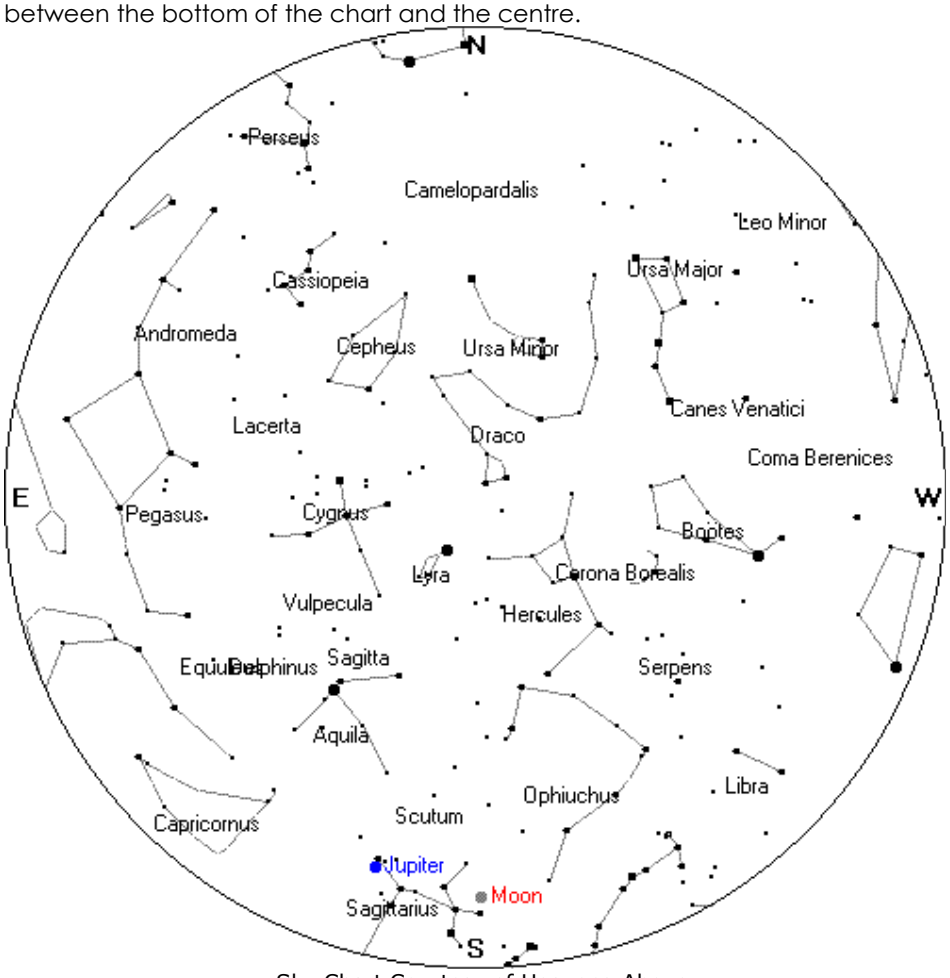
After 1am, a slightly more difficult target at magnitude 5.8 can be found in Aquarius. Again, use your sky chart to find phi aquarii. 5 degrees northeast of this magnitude 4.2 star you will see a group of three stars. Near these three is Uranus. That's not the only thing Aquarius has to offer for July. The Delta Aquarids meteor shower peaks on July 27th. Although not particularly bright, and best seen by people in the southern states, there is a chance you may spot a faint, fast moving Delta Aquarid. Ten to Twenty per hour are expected for those southern viewers.

Although the planets remain unremarkable to telescope viewers this month the clear dark skies will provide some deep sky treasures to those of us who attend the Island Star Party. Hope to see you there, until then, remember….Astronomy is looking up.

July 01	11:00amPST	Mercury reaches greatest western elongation
July 02	07:20pmPST	New Moon
July 04	04:00pm	Island Star Party
	01:00amPST	Earth is at Aphelion (farthest from the sun)
July 05		Island Star Party
July 09	01:00amPST	Jupiter reaches opposition
	09:35pm	New Quarter Moon
July 10	11:00pmPST	Mars within .7 degrees of Saturn

July	18	12:59amPST	Full Moon
July	25	11:42amPST	Last Quarter Moon
July	27		Delta Aquarid Peaks in the south
July	29	04:23pmPST	Mercury reaches superior conjunction

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.



Sky Chart Courtesy of Heavens-Above

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