COWICHAN VALLEY STARFINDERS ASTRONOMY CLUB

Clear Skies

Volume 13, Issue 5 September 2008

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Categories

Quick Links

Greetings!

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

This month's newsletter is dedicated to the memory of Pete Robertson

It is with great sadness that we say goodbye to Pete Robertson. Pete was a strapping fellow with a voice to match. He loved Astronomy and was filled with great and sometimes unusal ideas that had club members "thinking outside the box". Either way his ideas were greatly appreciated and most were integrated into the club. He was not a shy man but a gentle man. He had a "big heart" and was always one of the first to step in and lend a hand. He loved the comradery and social aspects of the club and he fit in so well.

Pete was a strong man and had been battling cancer for the past two years. On the evening of July 29th Pete's long struggle was over.

He was a great asset to our club and he will be truly missed. Our thoughts go out to the family and especially to Gail whom many of you remember as our official photographer of the 2007 ISP, designer of this years ISP poster and previous secretary for the club.

Photos Courtesy of Gail Robertson

Pete's time here is over but his spirit resides in the ones he left behind. Remember that people come into our lives for a reason, a season, a lifetime...let's enjoy them while we can.

Many thanks to this month's contributers: Moe Raven, Norm Willey, Bryon Thompson and Gary Thompson (for his dictation abilities).

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.

Our September meeting will be held at 7:30 on WEDNESDAY September 24th.
Hope to see you all there.

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Minutes - July

By Freda Eckstein

A small but determined crowd gathered at our July meeting for a slideshow of the of the ISP and to watch video footage of the sun. Unfortunately, try as we might we could not get the pictures to load on the laptop. After some very courageous attempts we decided to instead to forego the pictures and watch the video. We had a lot of fun ribbing Ed and have great conversations on the side. All in all a nice social. Pictures from the ISP will soon be loaded to the photo gallery on the website.

For more information about upcoming meeting dates go to Starfinders Meetings

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Upcoming Events

Not Star Partied out yet? Well keep on going, here's a listing of upcoming Star Parties in Western Canada.

Merritt Star Quest – August 30 – September 7

Loon Lake Road Reclamation Site (near Merritt), British Columbia
Organizer: Merritt Astronomical Society
Contact: Paul Greenhalgh
Tel: 604-853-3350
E-mail: fvas@shaw.ca
Website: http://www.merrittastronomical.com

Northern Prairie Starfest - September 2-7

Black Nugget Lake campground (near Tofield), Alberta
Organizer: Edmonton Centre/RASC
Contact: Warren Finlay
E-mail: warren.finlay@ualberta.ca
Website: http://www.edmontonrasc.com/nps.html

Spruce Woods Star Party - September 5-7

Spruce Woods Provincial Park (south of Carberry), Manitoba
Organizer: Winnipeg Centre/RASC
E-mail: spruce.woods.star.party@gmail.com

Alberta Star Party - September 25-28

Starland Recreation Area (west of Morrin), Alberta
Organizer: Calgary Centre/RASC
Contact: David Brown
Tel: 403-274-6723
E-mail: ASP2008@shaw.ca
Website: http://calgary.rasc.ca/asp2008.htm

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Web News

Something to check out on one of those "rainy days". If you're interested in what others are saying regarding observing, astro-imaging, equipment or education then check out the Reader's Forum at Astronomy.com

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

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Featured Articles

Articles

RETURN TO CATEGORIES

1. The Secrets of the Northern Lights
2. The Shape of Things to Come
3. School Teacher Discovers "Cosmic Ghost"
4. Probe Gets Close up to Enceladus
5. CERN's "Beam TV" Captures Start of LHC's Journey Back to the Beginning of Time
6. Puzzle of Meteorite Asteroid Link Solved

The Secrets of the Northern Lights- July 25/08 Credit NASA.

Researchers using a fleet of five NASA satellites have discovered that explosions of magnetic energy a third of the way to the Moon power substorms that cause sudden brightenings and rapid movements of the aurora borealis, called the northern lights. The culprit turns out to be magnetic reconnection, a common process that occurs throughout the universe when stressed magnetic field lines suddenly snap to a new shape, like a rubber band that's been stretched too far.

"We discovered what makes the northern lights dance," says Vassilis Angelopoulos of the University of California, Los Angeles. Angelopoulos is the principal investigator for the Time History of Events and Macroscale Interactions during Substorms mission (THEMIS).

Substorms produce dynamic changes in the auroral displays seen near Earth's northern and southern magnetic poles, causing a burst of light and movement in the northern and southern lights. Substorms often accompany intense space storms that can disrupt radio communications and global positioning system signals and cause power outages. Solving the mystery of where, when, and how substorms occur will allow scientists to construct more realistic substorm models and better predict a magnetic storm's intensity and effects. "As they capture and store energy from the solar wind, the Earth's magnetic field lines stretch far out into space. Magnetic reconnection releases the energy stored within these stretched magnetic field lines, flinging charged particles back toward the Earth's atmosphere," says David Sibeck, THEMIS project scientist at NASA's Goddard Space Flight Center in Greenbelt, Maryland. "They create halos of shimmering aurora circling the northern and southern poles."

Scientists directly observe the beginning of substorms using five THEMIS satellites and a network of 20 ground observatories located throughout Canada and Alaska. Launched in February 2007, the five identical satellites line up once every 4 days along the equator and take observations synchronized with the ground observatories. Each ground station uses a magnetometer and a camera pointed upward to determine where and when an auroral substorm will begin. Instruments measure the auroral light from particles flowing along Earth's magnetic field and the electrical currents these particles generate.

During each alignment, the satellites capture data that allow scientists to precisely pinpoint where, when, and how substorms measured on the ground develop in space. On February 26, 2008, during one such THEMIS lineup, the satellites observed an isolated substorm begin in space, while the ground-based observatories recorded the intense auroral brightening and space currents over North America.

These observations confirm for the first time that magnetic reconnection triggers the onset of substorms. The discovery supports the reconnection model of substorms, which asserts a substorm starting to occur follows a particular pattern. This pattern consists of a period of reconnection, followed by rapid auroral brightening and rapid expansion of the aurora toward the poles. This culminates in a redistribution of the electrical currents flowing in space around Earth.

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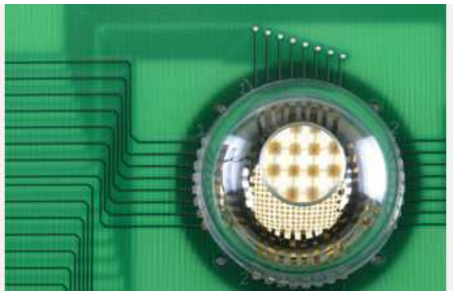
The Shape of Things to Come– August 6/08 Credit National Science Foundation.

Flexible web of micro-sensors enables eye-shaped camera, heralds a new class of electronics technology that can conform to almost any shape. Instead of using a flat microchip as the light sensor for their new camera, a team of engineers has developed a sensor that is a flexible mesh of wire-connected pixels. The mesh is made from many of the same materials as a standard digital-camera sensor, but has the unique ability to conform to convoluted, irregular surfaces.



The technology is already showing promise for photography, as the researchers conformed the array to a hemispherical shape and incorporated the device into a working eye-like camera. The new system eliminates some of the aberrations caused by current camera designs and improves the quality of captured images.

Researchers are testing the same design principles in a range of other applications, including as a thin, conformable monitor to detect electrical signals traveling across the undulating surface of the human brain.

Led by John Rogers of the University of Illinois at Urbana-Champaign and Yonggang Huang of Northwestern University in Evanston, Ill., the researchers announced their findings Aug. 7, 2008, in the journal Nature.

"This research is truly transformative," said Ken Chong, advisor in the National Science Foundation (NSF) Engineering Directorate, who is one of the officers overseeing the researchers' NSF grant. "Using simple mechanics principles, the researchers have produced, for the first time, electronic devices on a hemispherical surface so that they can take images much like those captured by the human eye."

The technology breakthrough is a novel approach that bypasses a traditional planar sensor of adjacent pixels and instead relies upon an array of pixels interconnected by small wires. Using a flexible, temporary backing, the researchers can form the array into a curved shape and then transfer the array to its permanent location affixed to a glass lens.

Over the last 20 years, many researchers have tried to manufacture such electronic eye systems, but until now, none were able to create a working camera. "This strategy opens up exciting, new engineering design possibilities by eliminating the two dimensional, planar constraints of conventional, semiconductor wafer-based optoelectronics," said John Rogers, Flory-Founder Chair Professor of Materials Science and Engineering at University of Illinois at Urbana/Champaign.

While a flat, planar sensor cannot flex without damaging its light-sensitive pixels, the new technology puts the strain on the wires, each flexing as much as 40 percent. Since the wires absorb the strain, the pixels are barely stressed, even when affixed to the retina-shaped housing of the new experimental camera.

Conventional digital cameras use planar chips based on rigid, brittle semiconductor wafer substrates that fracture at strains of less than 1 percent.

"Mechanics helps to reduce the stresses and strain in components, and guide and optimize the system design," said Yonggang Huang, Joseph Cummings Professor of Civil and Environmental Engineering and Mechanical Engineering, Northwestern University, who worked with his team to model the mechanical properties of the design so that it could be manufactured.

The current sensor array includes only 256 pixels, but because the technology is

based on established materials and manufacturing processes, the researchers ultimately expect more sophisticated sensors in higher density arrays. The same approaches can be used for nearly any class of semiconductor electronic device for a range of functions such as sensing, actuating and computing.

"We believe that some of the most compelling areas of future application involve the intimate, conformal integration of electronics with the human body, in ways that are inconceivable using established technologies," said Rogers, who is also affiliated with the Beckman Institute for Advanced Science and Technology and the Frederick Seitz Materials Research Laboratory. "We are working actively with collaborators to explore possibilities in advanced health monitors, prosthetic devices and therapeutic systems.

The electronic eye research emerged in part from the collaborative activities of the Center for Nano-Chemical-Electrical-Mechanical Manufacturing Systems (Nano-CEMMS).

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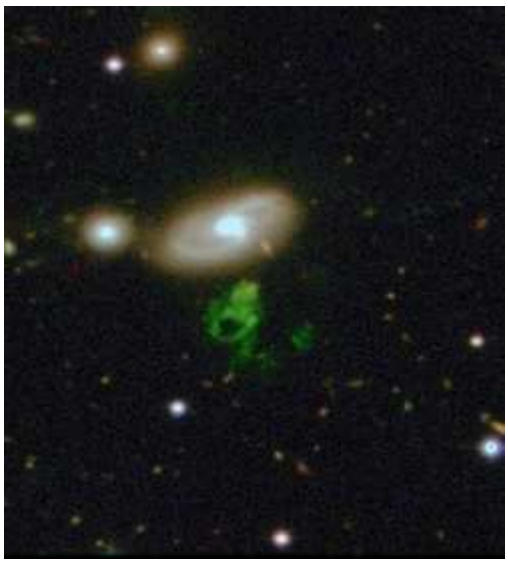
School Teacher Discovers 'Cosmic Ghost'– August 7/08 Credit University of Oxford.

A Dutch schoolteacher has discovered a mysterious and unique astronomical object through the Galaxy Zoo project, which enables members of the public to take part in astronomy research on-line.

Hanny van Arkel, a primary schoolteacher from the Netherlands, came across the image of a strange gaseous object with a hole in the center that has been described as a "cosmic ghost" while using the galaxyzoo.org web site to classify images of galaxies.

She posted about the image — which quickly became known as Hanny's "Voorwerp" after the Dutch word for "object" — on the Galaxy Zoo forum and the astronomers who run the site began to investigate. They soon realized the potential significance of what they think is a new class of astronomical object and will now use the Hubble Space Telescope to get a closer look at "Hanny's Voorwerp." "Hanny's Voorwerp" is the green blob of gas (center) and is believed to be a "light echo" from the bright, stormy centerof a distant galaxy that has now gone dim.



"At first we thought it was a distant galaxy," said Dr. Chris Lintott of Oxford University, a galaxyzoo.org team member, "but we realized there were no stars in it so that it must be a cloud of gas." What was particularly puzzling to astronomers was that the gas was so hot — more than 18,000° Fahrenheit (10,000° Celsius) — when there were no stars in the vicinity to heat it up. "We now think that what we're looking at is light from a quasar — the bright, stormy center of a distant galaxy powered by a supermassive black hole," said Dr. Lintott. "The quasar itself is no longer visible to us, but its light continues to travel through space and the Voorwerp is a massive 'light echo' produced as this light strikes the gas."

The black hole at the center of the galaxy, IC 2497, is now "turned off" — which is

why the quasar has gone dim — but around 100,000 years ago the quasar was bright enough to have been visible from Earth through a small, inexpensive telescope.

Dr. Lintott added: "From the point of view of the Voorwerp, the galaxy looks as bright as it would have done before the black hole turned off — it's this light echo that has been 'frozen in time' for us to observe. It's rather like examining the scene of a crime where, although we can't see them, we know the culprit must be lurking somewhere nearby in the shadows."

"IC 2497 is so close that if the quasar was still shining today, on a good night you could probably see it with a small telescope," said galaxyzoo.org team member Kevin Schawinski of the Yale University who recently moved there from Oxford University. "The nearest active quasar, called 3C 273, is 1.7 billion light-years further away."

Smaller light echoes have been noted around supernovae before but never anything of the scale and shape of the Voorwerp. As yet nobody has a sensible explanation for the hole that runs through its center. "It's amazing to think that this object has been sitting in the archives for decades and that amateur volunteers can help by spotting things like this on-line," said van Arkel. "It was a fantastic present to find out on my 25th birthday that we will get observational time on the Hubble Space Telescope to follow-up this discovery."

"This discovery really shows how citizen science has come of age in the Internet world," commented Professor Bill Keel of the University of Alabama, a galaxyzoo.org team member. "Hanny's attentiveness alerted us not only to a peculiar object, but to a window into the cosmic past, which might have eluded us for a long time otherwise. Trying to understand the processes operating here has proven to be a fascinating challenge, involving a whole range of astrophysical techniques and instruments around the world and beyond. This has also been some of the most rewarding astronomy I've done in years!"

Dr. Dan Smith of Liverpool John Moores University and Peter Herbert of the University of Hertfordshire were observing using the Isaac Newton Group of telescopes in La Palma, Spain, when word of the discovery filtered through. "When we got the news about Hanny's Voorwerp we were intrigued to find out what it was, and, fortunately, we were able to slew the telescopes round and get some great images and spectra to study it," said Dr Smith. "It was only later that we heard the story about how it had been discovered; it's inspirational that Hanny picked out this object from Galaxy Zoo in her spare time and nobody had ever seen anything like it before.'

During the last year, 50 million classifications of galaxies have been submitted on one million objects at www.galaxyzoo.org by more than 150,000 armchair astronomers from all over the world. The next stage of Galaxy Zoo will ask volunteers for more detailed classifications, making it easier to identify more unusual objects such as Hanny's Voorwerp.

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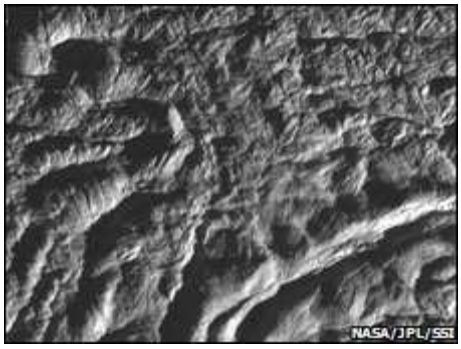
Probe Gets Close up to Enceladus – August 13/08 Credit BBC News.

The Cassini spacecraft has returned some remarkable new close-up images of the Saturnian moon Enceladus.



They were captured during a flyby on 11 August, with the probe passing above the icy terrain at a distance of just 50km at closest approach.

The pictures show previously unseen detail in the so-called tiger stripes that mark the south pole of Enceladus. These cracks run across a "hot-spot" region that is hurling plumes of ice particles into

space.

Scientists are intrigued by what might be driving this activity; and some have suggested the mechanisms involved could be sufficient to maintain a mass of liquid water below the moon's surface.

The flyby follows a similar close pass made in March, although on that occasion Cassini was turned to give the prime view to its Ion and Neutral Mass Spectrometer (INMS) and its Cosmic Dust Analyzer (CDA) - to allow them to "taste" the plumes.

Closer still
On this occasion, Cassini gave primacy to its cameras - its Imaging Science Subsystem - and the rest of its optical remote sensing instruments.

With the probe moving across the surface of Enceladus at 18 km/sec (about 40,000 mph), obtaining good pictures proved to be quite a challenge for the imaging team. "The challenge is equivalent to trying to capture a sharp, unsmeared picture of a roadside billboard about a mile away with a 2,000mm telephoto lens held out the window of a car moving at 50mph," they reported on their blog.

Two more Enceladus flybys are planned for October, the first of which will go even closer - to an astonishing 25km from the surface.

Enceladus measures about 500km in diameter, just one-seventh the diameter of Earth's moon. Cassini's manoeuvres are being commanded from Earth, at distance of more than one billion km. The Cassini-Huygens mission is a joint venture between the US space agency (Nasa), the European Space Agency (Esa) and the Italian Space Agency (ASI).

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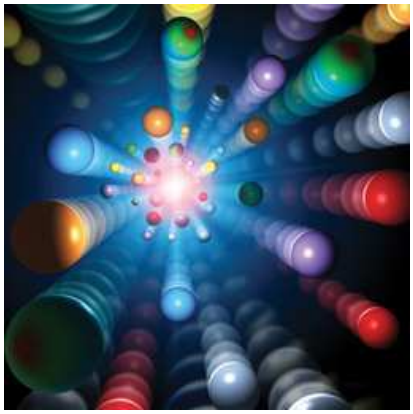
CERN's "Beam TV" Captures Start of LHC's Journey Back to the Beginning of Time – August 13/08 Credit the Daily Galaxy



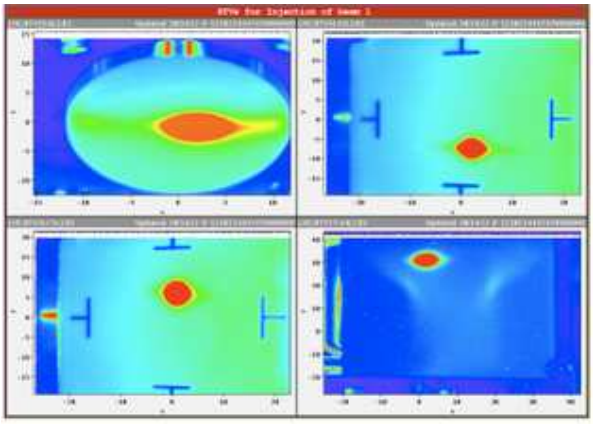
The world's largest and most costly physics experiment took another step toward a birth of its own last week 300 feet below ground outside Geneva. Scientists and engineers at CERN fired the first test beam of protons into the lab's Large Hadron Collider and sent them successfully part way around the accelerator's 17-mile racetrack.

That's a few million protons coming at you in the initial kick-off test image captured by the collider's "beam television," a few yards into the collider from the beam injection point last Friday evening.

Protons were injected into the main LHC ring and they traveled several meters before (presumably) crashing into a deliberate beam dump. This was a test in which the beam was injected into one sector only (Sector 1-2, near ATLAS— the ring is divided into eight sectors).

The blob in the Beam TV image is the not-very-well-centered beam, which is spattering through an alumina ceramic screen which lights up due to the radiation, and the image is captured by a CCD camera. This configuration is only used for tests only. Protons were injected into the LHC (clockwise/Beam 1) yesterday at about 6:30 PM, CET. The injection kicker fired and the beam appeared on the TDI (internal target)–this is a few meters into the LHC. The LHC team is now working on the kicker that needs to fire to keep the beam in the ring.

After the "television" camera was removed, the protons made it all the way to their destination, passing through Alice, one of the giant detectors built to observed proton collisions. The New York Times reported that a Web site summary of the evening's activities ended with the word "beer."



Physicists hope to start running protons around the entire ring on Sept. 10 and build up to smashing them together at energies of five trillion electron volts apiece in the month or two after that.

But the only data CERN's Large Hadron Collider (LHC) has produced thus far is a thoroughly debunked urban myth—that the particle accelerator buried under the Swiss-French border will create an apocalyptic black hole.

On September 10th, researchers will activate particle beams within the 17-mile-long ring, and the world's most powerful particle accelerator will begin collecting experimental data. The LHC's research potential is staggering, with physicists hoping to use the accelerator's extremely high-energy proton collisions to generate a range of theoretical particles. Some of those particles could help us to understand the nature of mass, including the as-yet-undetectable dark matter that accounts for so much of the universe's mass. Other particles might prove the existence of extra dimensions, or lead to entirely new theories or physical laws

The accelerator ring might be the pinnacle of human research into the microscopic unknown, but its activation is only the beginning of the search, not the end. Once started it will be a source of staggering amounts of data - it turns out that when you have a 23-km installation and sensors that can detect things right down to the proton scale, you get over two hundred megabytes a second out of the thing. After billions of dollars of building, they'll look pretty silly if the run out of storage space.

Instead, the data load will be spread over hundreds of participating facilities around the globe, filtered and organized by multiple tiers of routing centers. If the much-heralded Higgs is found, it won't be by a white-coated scientist hunkered in a high-tech Genevan cavern madly scribbling on a whiteboard. A computer in Nowhere, Someplace will match about fourteen pages of random-looking numbers to a preset condition then throw up a flag. A graduate student will spot that flag in the morning, run the simulation again, then tell his boss, who will tell him to check it three more times. He'll call his collaborators, and the news will spread all the way up the chain in a vast (but extremely dignified) academic version of fist-pumping and going "Yes!"

Will the efforts of the world find the Higgs boson, or will scientists who should know better succumb to the temptation of hosting the largest game of Counter Strike ever seen? We'll have to wait and see.

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Puzzle of Meteorite-Asteroid Link Solved– August 14/08 Credit MIT

For the last few years, astronomers have faced a puzzle: The vast majority of asteroids that come near the Earth are of a type that matches only a tiny fraction of the meteorites that most frequently hit our planet.

Since meteorites are mostly pieces of asteroids, this discrepancy was hard to explain, but a team from the Massachusetts Institute of Technology and other institutions has now found what it believes is the answer to the puzzle. The smaller rocks that most often fall to Earth, it seems, come straight in from the main asteroid belt out between Mars and Jupiter, rather than from the near-Earth asteroid (NEA) population.

The puzzle gradually emerged from a long-term study of the properties of asteroids carried out by MIT professor of planetary science Richard Binzel and his students, along with postdoctoral researcher P. Vernazza, who is now with the European Space Agency, and A.T. Tokunaga, director of the University of Hawaii's Institute of Astronomy.

By studying the spectral signatures of near-Earth asteroids, they were able to compare them with spectra obtained on Earth from the thousands of meteorites that have been recovered from falls. But the more they looked, the more they found that most NEAs — about two-thirds of them — match a specific type of meteorites called LL chondrites, which only represent about 8 percent of meteorites. How could that be?

"Why do we see a difference between the objects hitting the ground and the big objects whizzing by?" Binzel asks. "It's been a headscratcher." As the effect became gradually more and more noticeable as more asteroids were analyzed, "we finally had a big enough data set that the statistics demanded an answer. It could no longer be just a coincidence."

Way out in the main belt, the population is much more varied, and approximates the mix of types that is found among meteorites. But why would the things that most frequently hit us match this distant population better than it matches the stuff that's right in our neighborhood? That's where the idea emerged of a fast track all the way from the main belt to a "splat!" on Earth's surface.

This fast track, it turns out, is caused by an obscure effect that was discovered long ago, but only recently recognized as a significant factor in moving asteroids around, called the Yarkovsky effect.

The Yarkovsky effect causes asteroids to change their orbits as a result of the way they absorb the sun's heat on one side and radiate it back later as they rotate around. This causes a slight imbalance that slowly, over time, alters the object's path. But the key thing is this: The effect acts much more strongly on the smallest objects, and only weakly on the larger ones.

"We think the Yarkovsky effect is so efficient for meter-size objects that it can operate on all regions of the asteroid belt," not just its inner edge, Binzel says.

Thus, for chunks of rock from boulder-size on down — the kinds of things that end up as typical meteorites — the Yarkovsky effect plays a major role, moving them with ease from throughout the asteroid belt on to paths that can head toward Earth. For larger asteroids a kilometer or so across, the kind that we worry about as potential threats to the Earth, the effect is so weak it can only move them small amounts.

Binzel's study concludes that the largest near-Earth asteroids mostly come from

the asteroid belt's innermost edge, where they are part of a specific "family" thought to all be remnants of a larger asteroid that was broken apart by collisions. With an initial nudge from the Yarkovsky effect, kilometer-sized asteroids from the Flora region can find themselves "over the edge" of the asteroid belt and sent on a path to Earth's vicinity through the perturbing effects of the planets called resonances.

The new study is also good news for protecting the planet. One of the biggest problems in figuring out how to deal with an approaching asteroid, if and when one is discovered on a potential collision course, is that they are so varied. The best way of dealing with one kind might not work on another.

But now that this analysis has shown that the majority of near-Earth asteroids are of this specific type — stony objects, rich in the mineral olivine and poor in iron — it's possible to concentrate most planning on dealing with that kind of object, Binzel says. "Odds are, an object we might have to deal with would be like an LL chondrite, and thanks to our samples in the laboratory, we can measure its properties in detail," he says. "It's the first step toward 'know thy enemy'."

The research is being reported this week in the journal Nature.

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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.

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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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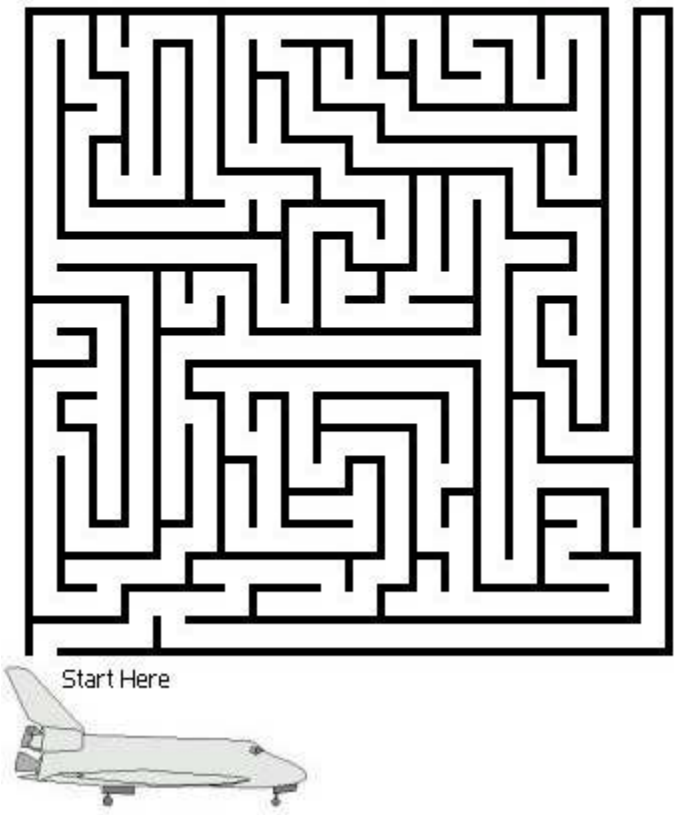
Kids Korner

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.

The Shuttle Maze below is from the *About Space Activity Book by Space.About.com*



Help the Space Shuttle Pilot find their way back to Earth.

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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**

This month opens with Venus chasing the setting sun. Venus shines at -3.8 and sets 30 minutes after the sun does. Like last month, Venus, Mars and Mercury perform

their horizon hugging dance in the footlights of the Western sunset. Little Mercury at magnitude 0.0 and Mars at magnitude 1.7 require binoculars to see their dim faces. Use brighter Venus as a guide to find the other two planets, but be quick as the trio set soon after the sun. Watch for the conjunction between Mars and Venus on September 11th when the pair are only .3 degrees apart. You will need a clear view of the Western horizon to see any of the dance at all. Better views of Venus will follow later in the year as it climbs higher in the sky.

Jupiter continues to dominate the night sky at magnitude -2.4 and sits low in the South just above the teapot of Sagittarius. Jupiter's retrograde motion (East to West) stops at the end of the first week of September. The big planet projects a shadow East of its disc and if you missed it last month you may have another chance to see one of the four large moons wink into view; reappearing as they emerge from this shadow in their counterclockwise orbit. The best candidates are Io and Europa as they are closest to the planet and have shorter orbital periods than the further Ganymede and Callisto.

Both Neptune and Uranus present themselves as good binocular objects this month. Neptune, at magnitude 7.8 is found in Capricornus. To find it, look for three stars in a line; 42 Capricornii at magnitude 5.2 and 44 and 45 Capricornii both at magnitude 6. Neptune starts September 1 degree West of 44 and moving West/Southwest passes 45 by month's end.

Uranus rises late low in the South reaching opposition on September 11th and can be found in Aquarius. At magnitude 5.7 it is a naked eye object from a dark site if you know where to look, but it is best seen with a pair of binoculars. Look 4 degrees Northeast from Phi Aquarii in the Eastern edge of Aquarius. Try to make out Uranus' distinctive blue green hue against the stars more obvious in telescopes but still visible through binoculars.

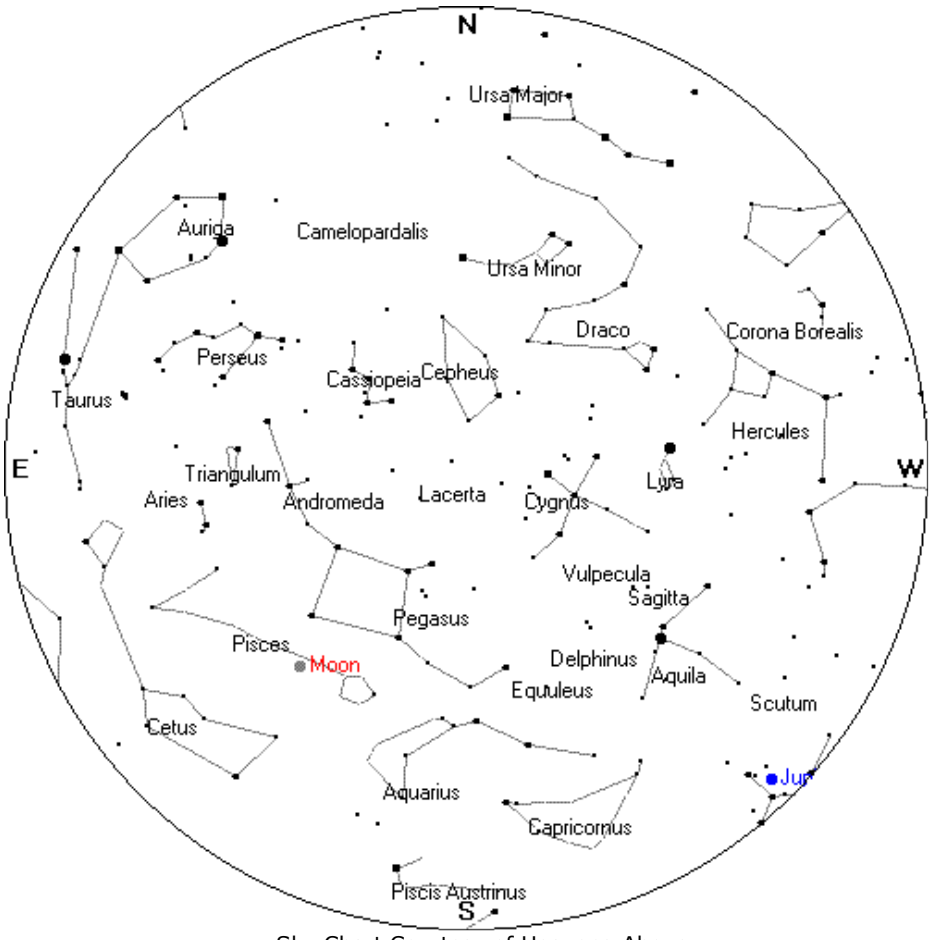
Saturn presents an early morning opportunity to see its rings before they appear to vanish from view early next year. On September 3rd the planet emerges from behind the sun after reaching solar conjunction (directly opposite the sun from the earth). You will need a clear view of the Eastern horizon to spot Saturn with a telescope just before sun rise. Remember to never point a telescope at a sun unless it is fitted with a proper solar filter. Even a brief glance without a filter is enough to cause permanent eye damage.

September is not known for its meteor showers. You may however, see a couple of Delta Aurigids in late September in the dark New Moon skies. There may be only ten per hour at its peak but he delta Aurigids are fast moving meteors. The radiant can be found about 10 degrees North of Capella. When you see a fast moving streak, if you trace its path across the sky and the line goes through this area you can be sure you have seen a Delta Aurigid and not a sporadic meteor. Here's hoping you have clear skies this month and can get out and enjoy September nights with a friend. Remember Astronomy is looking up!

September3	07:00pmPST	Saturn in conjunction with the sun
September 7	07:04amPST	First Quarter Moon
September 10	09:00pmPST	Mercury at greatest Eastern Elongation
September 11	10:00pmPST	Mercury passes 4 degrees south of Venus
September 11	03:00pmPST	Mercury passes .3 degrees north of Venus
September 12	07:00pmPST	Moon passes .8 degrees north of Neptune
September 12	07:00pmPST	Uranus at Opposition
September 15	02:13amPST	Full Moon
September 19	09:00pmPST	Moon passes 1 degree north of Pleiades
September 21	10:04pmPST	Last quarter Moon
September 22	08:44amPST	Autumnal equinox
September 29	01:12amPST	New Moon

Sky Chart —Here's your mid-September 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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