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Greetings!

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

I've heard nothing but good things about the 14th Annual Island Star Party (ISP).



Astronomers and organizers were beaming with the fact that the weather was good, the events were well attended and the partnership between CVSF and RASC was seamless. Both societies had much to offer and who knows? Maybe this will be a annual venture?

But besides all of that, we couldn't have done it without you (our sponsors and volunteers) who made our (ISP) such a success. Check out our ISP 2009 page for more information on our unsung heros.

For our members that were unable to attend the ISP, this is a reminder that Annual CVSF memberships are due; The membership form is available for downloading on the website. Click on the link below to download and print the form.

<http://www.starfinders.ca/membership.htm>

A **big welcome** goes out to our newest CVSF members. Thanks for your interest, heres a quick list of the benefits of membership:

- Access to the societies three telescopes;
- Monthly socials with engaging speakers;
- Notification when the monthly newsletter is posted to the website;
- ****Access to the CVSF listserve whose primary use is to instigate impromptu gorilla observing sessions; and,**
- An opportunity to socialize and talk about what we all hold so dear... astronomy.

Check out our website for more details <http://www.starfinders.ca/index.htm>

****Please note, access to the CVSF listserve is not automatic.** On your membership form you were asked to check the box if you would like to be added onto the list serve. We will be conducting a test of email addresses and listserve members shortly, so stay tuned ☺

May I remind you that we still have two director postions open. The scope and function of these postions are listed below:

Vice-President - fill-in with Presidential duties (co-ordinates the annual ISP, setup speaker series presenters, host monthly socials) when the president is unavailable.

Public Outreach Officer - set up sidewalk astronomy sessions with the public, help in promoting ISP.

If you are interested in joining our Board of Directors, please contact the vice-president@starfinders.ca . We welcome your involvement.

Speaking of socializing, our July "**A Night At the Movies**" was great fun, Thanks goes out to Moe who provided us with the documentary and Nancy, who saved

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the evening, by knowing how to microwave the popcorn. Yours truly only **2** remembers "the burnt pot method" ☹. Our next social is scheduled for August 26th where it will be "**show and tell**" viewing of the latest ISP pics and video footage.

In preparation for this social, we ask you to **please send in your pics**, either on cd or email so that we can get them on the site for history's sake. Contact the vice-president@starfinders.ca for more information.

And finally, thanks to this month's contributors Moe Raven and Bryon Thompson for their input and enthusiasm.

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Socials

Socials 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 Social will be held at **7:30 on WEDNESDAY August 26th**

This social is "**Show and Tell**" Where we will be viewing the latest ISP pictures and video footage.

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Highlights - July 26/09

By Paul Randall

Crunch....crunch....crunch. What?

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Upcoming Events

Every Monday - Astronomy Café from 7:30pm - 9:00 pm

Get together with local astronomers at the Fairfield Community Centre to discuss the night sky over coffee. On clear nights, there is observing too. Perfect for people interested in starting this hobby. All ages welcome.

Every Thursday till September from 8:00pm – 10:30pm at Butchart Gardens

800 Benvenuto Avenue — Brentwood Bay, BC

Visitors to Butchart Gardens will be welcomed by the Victoria Centre volunteers who will be providing Night Sky Viewing opportunities (weather permitting). All ages welcome.

Now till August 27 - STAR TREK: The IMAX Experience – 8:00pm nightly at RBCM

IMAX. The greatest adventure of all time begins with STAR TREK, the incredible story of a young crew's maiden voyage onboard the most advanced starship ever created: the U.S.S. Enterprise. On a journey filled with action, comedy and cosmic peril, the new recruits must find a way to stop an evil being whose mission of vengeance threatens all of mankind. Advance Tickets are available, see Events website: http://www.imaxvictoria.com/showtimes-rates/index.cfm?movieid=MO_20090511125144759147&publicschool=P

August 29 - Astronomy Talk and Night Sky Viewing from 7:30pm to 10:30pm at East Point, Saturna Island, BC. Admission: FREE



Other Star Parties:

August 15 - 23, 2009 Mt Kobau

Jim Failes, Secretary, Mount Kobau Astronomical Society tell us "The star party is now a GO as originally scheduled, beginning tonight at dusk (Aug. 15) and continuing through to dawn next Sunday (Aug. 23). Wildfire is not a significant threat at the moment thanks to cooler, damper weather the last few days. Yesterday we had reliable reports of significant snow on the upper slopes, but today, thank goodness, it's gone. The forecast after Sunday is warm and sunny".

August 19-23 Oregon Star Party 2009 Ochoco Forest

an astronomy adventure featuring quality deep sky viewing. For more information, visit the event website: <http://www.oregonstarparty.org/>

August 21 to 23 Astronomy Weekend At Cypress Hills

A weekend of astronomy themed activities on the Alberta side of the Cypress Hills Interprovincial Park, presented by Alberta Tourism, Parks & Recreation with the Medicine Hat Astronomy Club and the Calgary Centre of the Royal Astronomical Society of Canada. Includes daytime talks and evening stargazing sessions. More information is available at the events website: <http://www.cypresshills.com/>

Join Astronomy magazine on a Total Solar Eclipse cruise to the Marquesas Islands

Cruise to the Marquesas Islands to watch the July 11, 2010, total solar eclipse, which promises more than 4 minutes of totality. Scheduled for June 28-July 12, 2010, the tour boasts a 14-day voyage aboard the ship Aranui III. For more information see: Web site: www.melitatrips.com

NASA Launches (provided by NASA.Com):

Date: Aug. 25 +

Mission: STS-128

Launch Vehicle: Space Shuttle Discovery

Launch Site: Kennedy Space Center - Launch Pad 39A

Launch Time: 1:36 a.m. EDT

Description: Space shuttle Discovery will use a Multi-Purpose Logistics Module to carry experiment and storage racks to the International Space Station.

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This Month In History

Courtesy of: Nick Greene, About.com

- 05: 1973 - Mars 6 - USSR Mars Orbiter/Soft Lander launched.
- 07: 1971 - Apollo 15 splashed down safely.
- 12: 1978 - International Sun-Earth Explorer 3 - USA Interplanetary Monitor launched.
- 19: 1871 - Orville Wright born in Dayton, Ohio.
- 29: 1541 - Nicolaus Copernicus's book "De revolutionibus orbium coelestium" ("On the Revolutions of the Celestial Spheres") went to the printer.

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Cool Pics/Videos

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

Have you been infected by the heinous virus of physics misconceptions?

Find out from the folks at Camosun College's Physics & Astronomy department who urge you to take the Physics Savvy Quiz. Take the quiz at:

http://www.intuitor.com/physics_test/

Check out our Photo gallery on the website where you can find pics from past **4** and current Island Star Parties (ISP). Quick link is <http://starfinders.ca/photogallery.htm>

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Featured Articles

NASA Celebrates Chandra X-ray Observatory's 10th Anniversary – July 23/09 credit NASA

WASHINGTON -- Ten years ago, on July 23, 1999, NASA's Chandra X-ray Observatory was launched aboard the space shuttle Columbia and deployed into orbit. Chandra has doubled its original five-year mission, ushering in an unprecedented decade of discovery for the high-energy universe.



With its unrivaled ability to create high-resolution X-ray images, Chandra has enabled astronomers to investigate phenomena as diverse as comets, black holes, dark matter and dark energy.

"Chandra's discoveries are truly astonishing and have made dramatic changes to our understanding of the universe and its constituents," said Martin Weisskopf, Chandra project scientist at NASA's Marshall Space Flight Center in Huntsville, Ala.

The science that has been generated by Chandra -- both on its own and in conjunction with other telescopes in space and on the ground -- has had a widespread, transformative impact on 21st century astrophysics. Chandra has provided the strongest evidence yet that dark matter must exist. It has independently confirmed the existence of dark energy and made spectacular images of titanic explosions produced by matter swirling toward supermassive black holes.

To commemorate the 10th anniversary of Chandra, three new versions of classic Chandra images will be released during the next three months. These images, the first of which is available Thursday, provide new data and a more complete view of objects that Chandra observed in earlier stages of its mission. The image being released today is of E0102-72, the spectacular remains of an exploded star.

"The Great Observatories program -- of which Chandra is a major part -- shows how astronomers need as many tools as possible to tackle the big questions out there," said Ed Weiler, associate administrator of NASA's Science Mission Directorate at NASA Headquarters in Washington. NASA's other "Great Observatories" are the Hubble Space Telescope, Compton Gamma-Ray

The next image will be released in August to highlight the anniversary of when Chandra opened up for the first time and gathered light on its detectors. The third image will be released during "Chandra's First Decade of Discovery" symposium in Boston, which begins Sept. 22.

"I am extremely proud of the tremendous team of people who worked so hard to make Chandra a success," said Harvey Tananbaum, director of the Chandra X-ray Center at the Smithsonian Astrophysical Observatory in Cambridge, Mass. "It has taken partners at NASA, industry and academia to make Chandra the crown jewel of high-energy astrophysics."

Tananbaum and Nobel Prize winner Riccardo Giacconi originally proposed Chandra to NASA in 1976. Unlike the Hubble Space Telescope, Chandra is in a highly elliptical orbit that takes it almost one third of the way to the moon, and was not designed to be serviced after it was deployed.

Marshall manages the Chandra program for NASA's Science Mission Directorate. The Smithsonian Astrophysical Observatory controls science and flight operations from the Chandra X-ray Center. A list of Chandra's major scientific highlights, plus new multimedia and other material, is now available on a special "10 Year" webpage at: <http://chandra.harvard.edu/ten/>

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Hubble Captures Rare Jupiter Collision— July 24/09 credit ESA News



The checkout and calibration of the NASA/ESA Hubble Space Telescope has been interrupted to aim the recently refurbished observatory at a new expanding spot on the giant planet Jupiter. The spot, caused by the impact of a comet or an asteroid, is changing from day to day in the planet's cloud tops.

For the past several days the world's largest telescopes have been trained on Jupiter. Not to miss the potentially new science in the unfolding drama 580 million kilometres away, Matt Mountain, director of the Space Telescope Science Institute in Baltimore, Maryland, allocated discretionary time to a team of astronomers led by Heidi Hammel of the Space Science Institute in Boulder, Colorado.

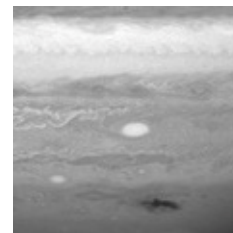
The Hubble picture, taken on 23 July, is the sharpest visible-light picture taken of the feature and is Hubble's first science observation following its repair and upgrade in August. Observations were taken with Hubble's new camera, the Wide Field Camera 3 (WFC3). "This is just one example of what Hubble's new, state-of-the-art camera can do, thanks to the hard work of the astronauts and the entire Hubble team", said Ed Weiler, associate administrator of NASA's Science Mission Directorate. "Fortunately, the best is yet to come!"

"Hubble's truly exquisite imaging capability has revealed an astonishing wealth of detail in the 2009 impact site", said Hammel. "By combining these images with our ground-based data at other wavelengths, our Hubble data will allow a comprehensive understanding of exactly what is happening to the impact debris. My sincerest congratulations and thanks to the team who created Wide Field Camera 3 and to the astronauts who installed it!"



Discovered by Australian amateur astronomer Anthony Wesley on Sunday, July 19, the spot was created when a small object plunged into Jupiter's atmosphere and disintegrated. The only other time in history such a feature has been seen on Jupiter was 15 years ago. "This is strikingly similar to the comet Shoemaker Levy 9 that impacted Jupiter in July 1994", said team member Keith Noll of the Space Telescope Science Institute. "Since we believe this magnitude of impact is rare, we are very fortunate to see it with Hubble", added Amy Simon-Miller of NASA's Goddard Space Flight Center. She explained that the details seen in the Hubble view show a lumpiness to the debris plume caused by turbulence in Jupiter's atmosphere. The spot is presently about twice the length of the whole of Europe.

Simon-Miller estimated that the diameter of the object that slammed into Jupiter was at least twice the size of several football fields. The force of the explosion on Jupiter was thousands of times more powerful than the suspected comet or asteroid that exploded over the Tunguska River Valley in Siberia in June 1908.



The WFC3, installed by astronauts on the Space Shuttle in August, is not yet fully calibrated. So while it is possible to obtain celestial images, the camera's full power cannot yet be realised for most observations. The WFC3 can still return meaningful science images that will complement the Jupiter pictures being taken with ground-based telescopes.

New pictures of Jupiter and its recent impact site keep pouring in, showing the rapidly growing atmospheric aftermath in increasingly greater detail. First discovered by Australian amateur astronomer Anthony Wesley on July 19, the Pacific Ocean-sized black spot is likely the result of a collision with an asteroid or comet. To read more click:

<http://www.astronomy.com/asy/default.aspx?c=a&id=8490>

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Robot Model Hits the Runway— July 25/09 credit LiveScience

What appeared to be petite woman in an elaborate wedding dress walked slowly down the runway in an Osaka fashion show earlier this week. The twist is that this was no blushing bride; this was the HRP-4C female robot.



Though encumbered by an elaborate wedding dress, HRP-4C easily navigated the ten meter runway at the fashion show. Developed by Japan's National

Institute of Advanced Industrial Science and Technology, the female humanoid⁷ robot stands just 5 feet 2 inches tall and weighs a mere 95 pounds - batteries included. The robot has highly realistic facial features, and is able to use facial motions and arm movements to indicate basic emotions, such as anger and surprise. HRP-4C robot developer Kazuhito Yokoi expressed the feelings of many when he said "Like the father of a bride, I feel both happy and sad."

Science fiction writer Fritz Lieber foresaw this development when he wrote the following in his 1954 short story Mechanical Bride: "Streamlined, smooth-working, absolutely noiseless, breath-takingly realistic. Each one is powered by thirty-seven midget electric motors, all completely noiseless, and is controlled by instructions, recorded on magnetic tape, which are triggered off by the sound of your voice and no one else's. There is a built-in microphone that hears everything you say, and an electric brain that selects a suitable answer. The de luxe model is built to your specifications, has fifty different facial expressions, sings two hundred love songs, and can carry on a thousand fascinating conversations..."

The robotic framework for the HRP-4C, without the face and other coverings, will go on sale for about \$200,000 each, and its programming technology will be made public so other people can come up with fun moves for the robot, the scientists said.

Japan boasts one of the leading robotics industries in the world, and the government is pushing to develop the industry as a road to growth. Automaker Honda Motor Co. has developed Asimo, which can walk and talk, although it doesn't pretend to look human.

Other robots, like the ones from Hiroshi Kobayashi at the Tokyo University of Science and Hiroshi Ishiguro at Osaka University, have more human-like faces and have been tested as receptionists.

But demands are growing for socially useful robots, such as ones that can care for the elderly and sick, said Yoshihiro Kaga, a government official in the trade and industry ministry. "We want this market to grow as an industry," he said.

For more information see the link:

<http://www.msnbc.msn.com/id/21134540/vp/29720315#32084785>

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Space Porch Open for Business – August 07/09 Credit Science@NASA

The International Space Station has a new "engawa"—and it's open for business. Engawa is Japanese for "porch," and while that might seem like a strange thing for a space station to have, researchers have been looking forward to the addition for a long time. Space shuttle Endeavour delivered the Japanese-built platform to the ISS on July 22nd and astronauts attached it to Japan's Kibo science lab a day later. Now, when a science experiment requires a dose of hard vacuum or radiation, it can be set "out on the porch" for exposure.



And that's just for starters. Left: The Japanese Exposed Facility seen from inside the International Space Station's Kibo science lab"

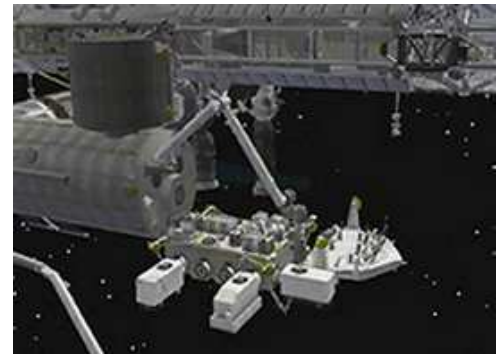
On the new 'Japanese Exposed Facility' [JEF for short], researchers can stage experiments to look up at the cosmos, down at Earth, or around at the environment the ISS voyages through," says Julie Robinson, ISS

Program Scientist at NASA's Johnson Space Center. "Besides resembling a porch⁸ this structure has unique features that differentiate it from the experiment exposure points² located elsewhere on the station."

For instance, the JEF offers temperature control. Like the space station's other external experiment locations, it has a warming plate for thermal control, but unlike the others the JEF includes a cooling feature.³ Another advantage is that JEF experiments can be serviced by Kibo's robotic arm⁴. "The beauty of this is that payloads can be designed to be 'plug and play,'" says Robinson, "so the robotic arm can install them -- no space walk required."

On July 24th, Kibo's arm deftly delivered the first two JEF experiments from the Shuttle payload bay to the porch and positioned them⁵. These Japanese experiments are the SEDA-AP⁶, short for Space Environment Data Acquisition equipment-Attached Payload, and MAXI⁷, or the Monitor of All-sky X-ray Image.

"SEDA-AP's sensors will measure the space environment of low Earth orbit -- neutrons, plasma, heavy ions, high-energy light particles, atomic oxygen, and cosmic dust," explains Robinson. With this experiment, researchers can test the mettle of materials and equipment exposed to the UV light, deep space radiation, and extreme temperatures of space. SEDA-AP will monitor material degradation to help researchers choose the hardest materials for building future space instruments, equipment, and vehicles.



Right: A computer-generated image of Kibo's robotic arm placing the Space Environment Data Acquisition equipment-Attached Payload "out on the porch."

MAXI is an all-sky X-ray scanner with super-sensitive X-ray slit cameras to search continuously for exploding stars, black holes, and other hot cosmic X-ray sources. Earth's atmosphere absorbs X-rays (lucky for us), so astronomers have to send their sensors to orbit. "MAXI will look at more than 1000 different X-ray sources and cover the entire sky," says Tai Nakamura⁸ of JAXA (Japan Aerospace Exploration Agency). Data from MAXI will be broadcast on the Internet. Upon detecting an X-ray source, MAXI's ground communication system will speed alerts to observers across the globe within 30 seconds.

The U.S. has two experiments destined for the JEF this fall: HREP-RAIDS, or the Remote Atmospheric and Ionospheric Detection System, and HREP-HICO, or the Hyperspectral Imager for the Coastal Ocean.⁹

"RAIDS will tell us about upper layers of Earth's atmosphere called the thermosphere and ionosphere," says Robinson. "These layers are tremendously important because that is where many spacecraft and satellites orbit. According to the Naval Research Laboratory, RAIDS is the most comprehensive survey of the thermosphere and ionosphere in 20 years."

HICO, also built by Naval Research Laboratory, is a hyperspectral imager for mapping coastal areas.¹⁰ That simply means it collects detailed information on the light reflected from these locations. Traditional multispectral sensors, like Landsat, lump the light measured into only a few bands; hyperspectral sensors have hundreds of bands.



Right: The Hyperspectral Imager for the Coastal Ocean (HICO) will be installed on the space porch this fall.

"Hyperspectral sensors are like Landsat on

steroids," says Robinson. "But HICO is a test unit that lacks Landsat's spatial resolution. Similar imagers have flown on aircraft, and another hyperspectral imager is on NASA's Earth Observing-1 satellite as a technology demonstration."

"The JEF will help us figure out whether HICO would be feasible for a satellite platform. The 'porch' is perfect for proving imaging technologies in space before investing in sophisticated optics for instruments and putting them on satellites. If HICO passes with flying colors and an operational imager is developed, that new imager could provide unprecedented maps of coastal features."

The JEF can host nine different experiments at once and has places for communications equipment, storage, and for berthing Japan's HTV-exposed pallet. Many interesting new investigations are planned for the JEF. Stay tuned to Science@NASA for updates from the porch.

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Stellar Light Show, and Magic Act, to Begin– August 13/09 Credit Astronomy.com

Next week marks the return of both a cosmic mystery and a great opportunity for amateur astronomers.

Starting in August, the normally bright star Epsilon (ϵ) Aurigae in the constellation Auriga the Charioteer will begin to dim. After around 6 months, it'll stay dim for about a year, and then slowly brighten until it regains its usual shine. And, adding more confusion, in the middle of its darkest moment, Epsilon Aurigae will temporarily brighten almost two-tenths of a magnitude. This unusual light show happens every 27.1 years and has been a continual source of amazement to every new generation of stargazers.



Amateur astronomers can make significant contributions to this International Year of Astronomy by closely monitoring Epsilon Aurigae's varying brightness. Even naked-eye observations will confirm its drop from a magnitude of 3.0 to 3.8, though more sophisticated tools would help, too. At this point, astronomers need all the help they can get.

The closest equivalent to this dimming and brightening is a binary star system eclipse: When one of the two stars passes in front of the other, the whole thing looks dimmer to us on Earth because only one of its star's light reaches us, instead of the usual both. (Binary stars are typically so far away they appear as a single star to the naked eye.)



Use this finder chart to record changes in Epsilon (ϵ) Aurigae's brightness. The magnitudes (decimal points have been removed) of the comparison stars will help with your estimates. Astronomy: Roen Kelly

But binary eclipses usually occur every few days and last only hours, a far cry from the years-long activity of Epsilon Aurigae. And what of that surprising mid-eclipse peak in brightness? Some astronomers currently theorize Epsilon Aurigae August be a binary system where

the companion star brings with it a huge accretion disk of dust and gas, blocking

the main star's light (the hole in the disk would account for the peak). Other models put two stars within that disk, making the whole thing a trinary system. Recent observations also suggest ongoing changes within the system, as might be consistent with a red giant evolving to a white dwarf. 10

This is one of the few genuine mysteries left to us in the galaxy, and it might be changing before our eyes. "[its happening] on a time scale of decades rather than centuries or millions of years," said Robert Stencel of the University of Denver. Each eclipse happens a little differently, so we never really know what to expect. This year's observations might provide all the answers, or just leave us with new questions.

That's why the amateur astronomers are so essential. "If we have people in Canada or Finland watching this thing during the high summer," Stencel said, "they might be able to help us fill in some blanks." So observers of the northern latitudes take note: Astronomers need you to help figure out Epsilon Aurigae's mystery. With any luck, we'll have it all figured out by next time, in 2036. And if not, well, we're getting used to that.

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Mars' Victoria Crater Seen from New Angle– August 13/09 Credit *Space.com*

An image of the Victoria Crater in the Meridiani Planum region of Mars was taken by the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter.



The image was captured at more of a sideways angle than earlier images of this crater. This view is similar to what would be observed by looking out the window of an airplane flying over Mars. The camera pointing was 22 degrees east of straight down (east is at the top of the image).

The most interesting features of the crater are in its steep walls, which are difficult to see from straight overhead. A bright band near the top of the crater wall is especially prominent in this view. The image's colors have been enhanced to make subtle differences more visible.

Earlier HiRISE images of the Victoria Crater supported further exploration by NASA's Opportunity rover and contributed to joint scientific studies. Opportunity explored the rim and interior of this 800-meter-wide (half-mile-wide) crater from September 2006 through August 2008. The rover's on-site investigations indicated that the bright band near the top of the crater wall was formed by diagenesis (chemical and physical changes in sediments after they were deposited). The bright band separates bedrock from the material displaced by the impact that dug the crater.

This view is a cutout from a HiRISE exposure taken on July 18, 2009. Some of Opportunity's tracks are still visible to the north of the crater (left side of this cutout). Full-frame images from this HiRISE observation, catalogued as ESP_013954_1780, are at http://hirise.lpl.arizona.edu/ESP_013954_1780. The full-frame image is centered at 2.1 degrees south latitude, 354.5 degrees east longitude. It was taken at 2:31 p.m. local Mars time. The scene is illuminated from the west with the sun 49 degrees above the horizon.

The Mars Reconnaissance Orbiter is managed by NASA's Jet Propulsion Laboratory, at Caltech, for NASA's Science Mission Directorate in Washington. The High Resolution Imaging Science Experiment is operated by the University of Arizona, Tucson.

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'Hidden Portal' Concept Described: First Tunable Electromagnetic Gateway – August 14/09 Credit ScienceDaily

While the researchers can't promise delivery to a parallel universe or a school for wizards, books like Pullman's *Dark Materials* and JK Rowling's *Harry Potter* are steps closer to reality now that researchers in China have created the first tunable electromagnetic gateway. The work is a further advance in the study of metamaterials, published in *New Journal of Physics* (co-owned by the Institute of Physics and German Physical Society).



Entrance to platform nine and three-quarters at King's Cross Station, used by Harry Potter on his way to school. New research describes the concept of a gateway that can block electromagnetic waves but that allows the passage of other entities, like a 'hidden portal'. (Credit: iStockphoto/Guy Erwood)

In the research paper, the researchers from the Hong Kong University of Science and Technology and Fudan University in Shanghai describe the concept of a "a gateway that can block electromagnetic waves but that allows the passage of other entities" like a

"hidden portal" as mentioned in fictions."

The gateway, which is now much closer to reality, uses transformation optics and an amplified scattering effect from an arrangement of ferrite materials called single-crystal yttrium-iron-garnet that force light and other forms of electromagnetic radiation in complicated directions to create a hidden portal.

Previous attempts at an electromagnetic gateway were hindered by their narrow bandwidth, only capturing a small range of visible light or other forms of electromagnetic radiation. This new configuration of metamaterials however can be manipulated to have optimum permittivity and permeability – able to insulate the electromagnetic field that encounters it with an appropriate magnetic reaction.

Because of the arrangement's response to magnetic fields it also has the added advantage of being tunable and can therefore be switched on and off remotely.

Dr Huanyang Chen from the Physics Department at Hong Kong University of Science and Technology has commented, "In the frequency range in which the metamaterial possesses a negative refraction index, people standing outside the gateway would see something like a mirror. Whether it can block all visible light depends on whether one can make a metamaterial that has a negative refractive index from 300 to 800 nanometres."

Metamaterials, the area of physics research behind the possible creation of a real Harry Potter-style invisibility cloak, are exotic composite materials constructed

at the atomic (rather than the usual chemical) level to produce materials with 12 properties beyond those which appear naturally.

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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

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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.

Make a Hubble Space Telescope – courtesy of Amazing Space

You can make a model of the Hubble Space Telescope for under \$20 with parts from your local hardware and craft stores. Your model won't be a working telescope, but it will show many of Hubble's important features.

Visit HubbleSite for instructions on how to build your own Hand-Held Hubble. Once you're done, submit a picture of yourself and your model, and HubbleSite May post it online. http://hubblesite.org/the_telescope/hand-held_hubble/

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The Sky This Month

By Bryon Thompson

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

My apologies for this article being produced so late in the month. Take the time to share the view that Galileo experienced more than 400 years ago that changed the world of science; (better in fact than the view he

witnessed, due to the much better optics that are available to us today). His observations of Jupiter's moons was one of the factors that led to Galileo's Solar System shattering proclamation that the Earth revolved around the Sun and not the other way. He observed that the moons revolved around Jupiter. A simple enough thing in today's times but it was contrary to the belief at the time that all planetary bodies revolved around the earth. You can share these observations by focusing on the giant planet this month. Jupiter is the main performer through August. The skies are clear, the nights warm and rising early in the evening is the King of planets; Jupiter, with all its mystique and wonder. It reaches opposition on the **14th** and shines a whopping magnitude -2.9. This is a good time to watch the dance of the four large moons, Io, Callisto, Ganymede and Europa as they orbit the Gas Giant. At times you will see all four moons line up and at other times Jupiter appears to have fewer than four as they pass behind the planet. Europa and Ganymede cast definite shadows on Jupiter's cloud tops on the night of August **26/27**. For us western observers Jupiter will rise with the shadows already on its face. Europa's shadow will finish its transit by 10:12 p.m. and Ganymede's shadow will finish its transit by 11:20 pm on the **26th**.

Jupiter provides us with a great way to find Neptune as well. The two planets start their western traverse of the sky on the 2nd of August only 2 degrees apart in Capricornus but by the end of the month they have moved to 5 degrees of angular distance. Reaching opposition on August **17th** Neptune can be found in Capricornus on the opposite side of 45, 44, and 42 Capricornii from Jupiter. The blue grey planet shines dimly at Magnitude 7.8 and appears one and a half moons width west of Mu Capricornii in the middle of August.

Mars can be seen to rise around 2 AM local time moving from Taurus to Gemini. It rises about an hour earlier by month's end. Despite what many friends have asked me about the apparent size of Mars reaching full moon status as erroneously reported on internet circulations, Mars will appear quite dim, its disc reaching a mere 6" across and its magnitude hovering around 1.1. It will get a little brighter by December but don't hold your breath for the planet to ever appear as large as the full moon.

Venus will enter the sky in the late morning hours an hour or so before twilight. Its brilliant -4.0 magnitude outshines everything except the aforementioned full moon. Venus resides in Gemini and passes into Cancer by month end.

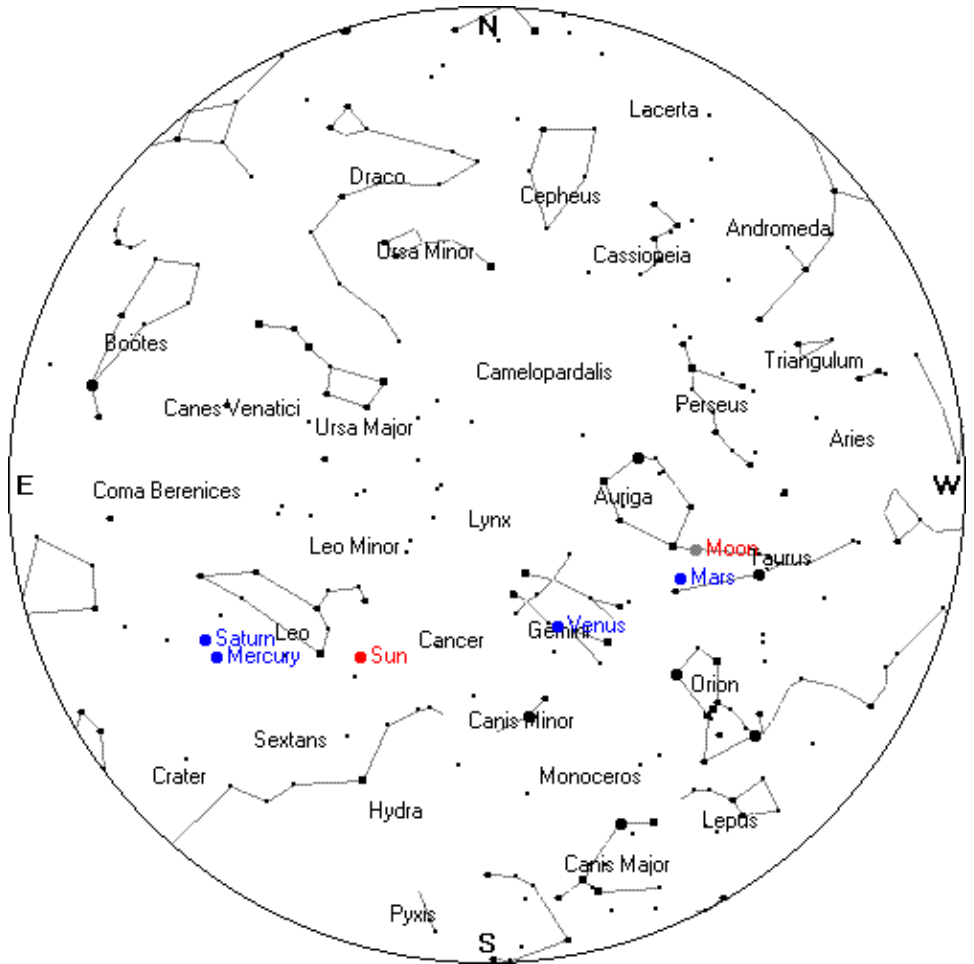
Saturn is moving towards conjunction with the sun in September. The event of the rings reaching an edge on angle will be lost to earthly viewers in the sun's glare. The large gas giant reappears in the early morning sky in October when the rings will slowly begin to reappear as well.

The Perseid Meteor shower put on a good show in the early morning hours of the **12th** of August. The peak lasted between 1:30AM and 4:00AM. It was cloudy where this writer resides and of course I missed it. Friends however reported seeing the Bolide that occurred near the end of the peak period. It apparently left a smoke trail that stretched across the sky and produced flames of brilliant red and green. I hope you all get a chance to get out and enjoy the night skies of August. Till next time, remember that astronomy is looking up.

August 5 05:55pmPST	Full Moon
August 10 06:00pmPST	Sun passes through Saturn's ring plane
August 12 01:30amPST	Perseid Meteor Shower Peaks
August 13 11:55amPST	Last quarter Moon
August 13 11:00pmPST	Jupiter at opposition
August 14 evening	Jupiter shines brightest at magnitude -2.9 (brightest since October 1999)
August 17 03:00pmPST	Neptune at opposition
August 20 03:02amPST	New Moon
August 26 10 - 11pmPST	Europa and Ganymede's shadows transit Jupiter
August 27 04:42amPST	First Quarter Moon

Sky Chart —Here's your **mid-August** 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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