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1. Greetings!

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

This month is all about "Spooky" things and our "Clear Skies" edition is no exception.

Some of the cool features include Spooky sounds from NASA's JPL. Where the signals in the sound files that you can listen to were acquired from Voyager 1's plasma wave instrument as the spacecraft approached the "Sonic Boom" of Jupiter in 1979.

Our October Social (WEDNESDAY October 27th) is as mysterious as it gets. Dr. Robert Kowalewski (professor and chair of the Physics and Astronomy Dept at UVIC) unfurls symmetries – and their violation – and leads to the mysteries currently being addressed by leading international projects such as the BaBar experiment at the SLAC National Accelerator Lab and the ATLAS experiment at the CERN laboratory.

What's lighting up the glowing object in "Hubble Shoots a Spooky Snapshot of a Faraway Haunted Nebula"? Astronomers have no idea. Hubble keeps us guessing while capturing "A Spiral Going Viral" but it is Albert Einstein's entanglement he dubbed "spooky action at a distance" which outlines the freaky ways our world works.

We couldn't resist a top ten list of Strange and Amazing Astronomy Facts for all you "did you know it all's". Did you know that every second the Sun's core releases the equivalent of 100 billion nuclear bombs? See, pretty amazing.

The Kids Korner lets you send a message to the Witch using a maze (similar to the regular post office route). And last but definitely not least is "The Sky this Month" where Jupiter is the starring attraction. Of course our sky is never tranquil; we have our fill of meteor showers, transits and comets coming our way. As Bryon points out "all we have to do is look up".

Many thanks to this month's contributors Moe R and Bryon T.

By Freda Eckstein

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

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2. Socials

Socials are held on the 4th Wednesday of each month at the home of Bryon and Freda. Click on the [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 October 27th**
Feature: "The (Sub-atomic) Generation Gap: Symmetries and Mysteries"
Presented by Dr. Robert Kowalewski.

The world we live is made of essentially four fundamental particles: the up and down quarks that form atomic nuclei, the electron and its elusive neutrino. Yet this pattern of particles seems to be repeated twice more at larger masses; these repetitions are called generations. We don't know why they exist, but we now understand that their existence is intimately related to how the universe evolved from a hot, primordial ball of energy to the one we live in today, where matter has triumphed over antimatter and the heavier generations are largely absent. The story involves symmetries – and their violation – and leads to the mysteries currently being addressed by leading international projects such as the BaBar experiment at the SLAC National Accelerator Lab and the ATLAS experiment at the CERN laboratory.

Bio:

Dr. Kowalewski is a professor at the University of Victoria where he is currently the Chair of the Physics and Astronomy department. Originally from the United States, he was born in Buffalo, New York and completed a Ph.D. at Cornell University. He came to UVic in 1997 following 8 years as a researcher at CERN. Dr. Kowalewski's research interests include both detailed studies of weak decays of quarks (on the BaBar experiment at SLAC) and searches for new phenomena at the high energy frontier (on the ATLAS experiment at CERN's Large Hadron Collider).

See you all there

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3. Social Highlights – September 22nd, 2010

By Nancy Kirshfelt

Our September social was held on Sept. 22 at Brian and Joanne Robillard's home in Mill Bay. In attendance were ten adults, two children and one very skittish cat.

Paul Randall and Brian Robillard started off the meeting by expressing how happy they were with the Star Party this year (held on the Labour Day weekend). It was very well done and all feedback was very positive. The caretaker of Bright Angel Park had a very nice time at the party and seemed very positive about future use of the park for observing.

Ed Nicholas reported that our profit from the Star Party was a grand total of \$247.14. Everyone is very pleased to know that we did in fact make some money on our first star party in this new location! We then spent some time going over the "To Do List" for next year and compiling an inventory list for all the club's belongings. Then we all relaxed and looked at photos from this year's star party that various people had brought with them to share. These photos will soon be up on the Cowichan Valley Star Finders website. Enjoy!

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4. Upcoming Events



Now Playing at the National Geographic IMAX Theatre, Victoria
Dinosaurs Alive

A global adventure of science and discovery -- featuring the earliest dinosaurs of the Triassic Period to the monsters of the Cretaceous "reincarnated" life-sized for the giant IMAX® screen. For show times see website: http://www.imaxvictoria.com/showtimes-rates/index.cfm?movieid=MO_20100415154232685499&publicschool=P

Hubble, Change How You View Our Universe!

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

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

Every Wednesday from 8-10 In The Sky Above, at UVic

The University of Victoria's newest stellar acquisition is the largest telescope on a university campus in Canada, and starting Oct. 13, members of the public are invited to take in the view every Wed. night at UVic. The telescope is on the roof of UVic's new science building and is the country's fifth largest overall. Visitors can expect to observe visible planets, double stars, open clusters, nebulae and even the Andromeda Galaxy.

Weekly viewings continue through April 2011, except last two Wed. in Dec.

Bob Wright Centre, fifth floor (use main lobby elevator on east side of building)

Admission is free. All ages and levels of cosmological knowledge are welcome.

Evening parking is \$2.

Campus maps are available at www.uvic.ca/visitors/explore/maps.

For event info, contact the astronomy department at the numbers below.

Contacts: Russell Robb (Senior Lab Instructor, Department of Physics & Astronomy) at 250-721-7750
250-721-7750 or robb@uvic.ca

19 October - 6:30 pm Café Scientifique "Riding a giant telescope to the beginning of time." By Luc Simard at Strathcona Hotel - Maple Room 919 Douglas Street, Victoria BC

Hosted by: The Centre for Biomedical Research and The Department of Physics and Astronomy.

Sometimes science at a university happens in a way that is isolated from the general public. Cafe Scientifique is an informal seminar series that provides insight into popular Science related topics which are of interest to the general public. These seminars are opportunities for the public to meet local researchers and discuss some of the most interesting and sometimes contentious research currently underway in Canada. We at the Centre for Biomedical Research and the Department of Physics and Astronomy at UVic hope you will join us at our Cafe Scientifique events. Think of it like a subscription to theatre. Except this is the theatre of the mind. Admission: FREE. More info: Marjorie Wilder 250-472-4067

NASA Launches credit NASA.Com:

No Launches for October

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5. This Month In Exploration History

Courtesy of: NASA

From the early days of experimental airplanes to NASA's soaring space shuttles, the evolution of flight has mirrored the evolution of society. The ongoing scientific discoveries that are part of aeronautics and space flight have improved life on Earth and allowed humans to begin investigating the secrets of the universe. "This Month in Exploration" presents the rich history of human flight, contextualizing where we've been and examining the exploration history NASA is making today.

Lt. James H. DoolittleLt. James H. Doolittle of the United States Air Service and his Curtiss-R3 C-2 seaplane. Credit: NASA 95 Years Ago

October 15, 1915: The National Advisory Committee on Aeronautics (NACA) instructed its secretary to share with the United States government the results of investigations into aeronautical activity. The NACA secretary worked with secretaries from many other government departments to encourage continued support for experimental aeronautics development. NACA was the precursor to NASA and was absorbed into the new agency in 1958.

85 Years Ago

October 26, 1925: Lt. James H. Doolittle of the United States Air Service won the Schneider Cup Race flying a Curtiss-R3 C-2 seaplane racer in Baltimore. He also broke the seaplane speed record by attaining 245.7 mph during the race.

75 Years Ago

October 30, 1935: The First Boeing B-17 "Flying Fortress" prototype crashed on takeoff at Wright Field in Ohio. The control locks were left on during flight-testing. Despite the crash, the United States Army Air

Corps was interested in using the plane as a strategic bomber. The "Flying Fortress" would eventually be flown by the U.S. in World War II.

Technicians performing preflight checkout and testing of the Ulysses spacecraft. Technicians perform preflight checkout and testing of the Ulysses spacecraft. Credit: NASA 60 Years Ago

October 26, 1950: The United States Army contracted with Douglas Aircraft for the design, development, fabrication and flight testing of its first armed nuclear surface-to-surface rocket, nicknamed the "Honest John." The "Honest John" was a simple, free-flight rocket designed to fire like conventional artillery in battlefield areas. The rocket wouldn't become obsolete until 1982.

50 Years Ago

October 4, 1960: The United States Air Force successfully placed the COURIER I-B active communications satellite into orbit using a Thor-Able-Star launch vehicle at NASA's Kennedy Space Center, Fla. After completing one orbit, it transmitted a message from President Dwight D. Eisenhower to the United Nations. The launch also marked the 100th launch of the Douglas Thor rocket, which set a record by transporting 60 percent of U.S. satellites into orbit.

45 Years Ago

October 14, 1965: NASA launched the Orbiting Geophysical Observatory (OGO)-2 aboard a Thor rocket from Vandenberg Air Force Base, Calif. The OGO-2 was a large satellite observatory designed to take atmospheric measurements primarily over Earth's polar areas.

40 Years Ago

October 20-27, 1970: The former USSR launched the Zond 8 towards the moon from an Earth orbiting platform, the Tyazheliy Sputnik. The spacecraft transmitted images of earth and of the lunar surface, and obtained various scientific measurements.

35 Years Ago

October 16, 1975: NASA launched the first operational Geostationary Operational Environmental Satellite (GOES-A/SMS-C) for the National Oceanic and Atmospheric Administration (NOAA) aboard a Delta rocket. GOES-A was the first in a series of geosynchronous weather satellites.

Catherine G. Coleman, a Columbia (STS-73) mission specialist. Catherine G. Coleman, a Columbia (STS-73) mission specialist, working with a microgravity experiment. Credit: NASA 25 Years Ago

October 3, 1985: NASA launched space shuttle Atlantis (STS-51J) from NASA's Kennedy Space Center, Fla. on its first flight. The shuttle crew deployed a classified satellite for the United States Department of Defense.

20 Years Ago

October 6, 1990: NASA launched space shuttle Discovery (STS-41) from NASA's Kennedy Space Center, Fla. with the Ulysses solar spacecraft aboard. Ulysses was designed by the European Space Agency (ESA) to explore the heliosphere of the sun.

15 Years Ago

October 20, 1995: NASA launched space shuttle Columbia (STS-73) from NASA's Kennedy Space Center, Fla. Seven microgravity experiments from NASA Lewis Research Center (now NASA's Glenn Research Center) in Cleveland, Ohio kept the shuttle crew occupied 24 hours a day and reinforced the center's thirty years of international leadership in the field of Microgravity Science.

10 Years Ago

October 11-24, 2000: NASA launched space shuttle Discovery (STS-92) from NASA's Kennedy Space Center, Fla. Discovery docked with the International Space Station. The crew installed a base structure for the U.S. solar array (the "Z-1 Truss") and an orbiter docking station for the U.S. segment of the space station (the "Pressurized Mating Adapter 3"). They also completed four space walks.

5 Years Ago

October 12, 2005: The People's Republic of China launched the spacecraft Shenzhou 6 (meaning Divine Ship) by a Long March 2F rocket from Jiuquan Satellite Launch Center in northwest China. China's first manned spaceflight, it carried two Chinese astronauts, Fèi Jùnlóng and Niè Hǎishèng. It orbited earth for about five days.

Present Day

October, 2010: This month, NASA contractor Applied Research Associates, Inc. of Albuquerque, N.M. will conduct a Solar Tower Test of the Advanced, Ablative Aeroshell at the unique National Solar Thermal Test Facility in Albuquerque. The aeroshell is a 70 degree flattened cone shaped shell, with a diameter of 1 meter. This shell is intended to fit on the end of a spacecraft, such as a Mars entry vehicle. It takes the brunt of the heat experienced by spacecraft during entry into a planet's atmosphere. Compared to other aeroshells used until this point, this new technology is expected to withstand more heat and help reduce vehicle mass, contributing to a reduction of mission risk and cost. It can be applied for missions to Mars, Titan, Venus and Neptune and for return to Earth.

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6. 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".

Carter Emmart demos a 3D atlas of the universe For the last 12 years, Carter Emmart has been coordinating the efforts of scientists, artists and programmers to build a complete 3D visualization of our known universe. He demos this stunning tour and explains how it's being shared with facilities around the world

http://www.ted.com/talks/carter_emmart_demos_a_3d_atlas_of_the_universe.html

Spooky Sounds – credit JPL NASA

Instruments aboard NASA spacecraft record data that can be converted into sound files, which help scientists better understand the observations.

<http://www.jpl.nasa.gov/multimedia/sounds2/index-flash.html>

2010 ISP Pictures are coming....stay tuned.

Check out our Photo gallery on the website where you can find pics from past Island Star Parties (ISP).

Quick link is <http://starfinders.ca/photogallery.htm>

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7. Featured Articles

Articles

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Hubble Shoots a Spooky Snapshot of a Faraway Haunted Nebula – August 18/10 credit Popsci



This spooky image of a tiny nebula known as IRAS 05437+2502 was recently released by the Hubble Space Telescope, but perhaps even more eerie than the wispy, ghost-like appearance of the little-studied star forming region is the boomerang-like light crowning the nebula. Though the Infrared Astronomical Satellite (IRAS) first discovered the

nebula in 1983, astronomers have no clue what is lighting up this glowing object.

Captured by the Wide Field Channel of Hubble's Advanced Camera for Surveys,

the image actually contains a relatively narrow field of view as the nebula itself isn't very big. Not much is known about it outside of the fact that it's in the constellation Taurus and it wears a mysterious glowing hat atop its head. One hypothesis suggests a massive star that since accelerated to a high velocity and departed the nebula spawned the glowing matter long ago, though there's no evidence to speak of to confirm or deny that theory. The air of mystery surrounding such a stunning image is all right by us.

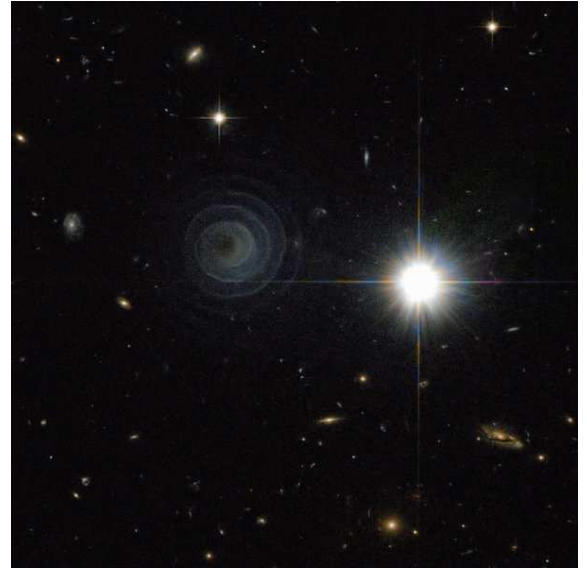
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Celestial Spiral Goes Viral – Sept 7/10 credit CosmicLog

The Hubble Space Telescope spots an unusual spiral nebula around the star LL Pegasi. Astronomers say the spiral shape was created by material swirling out from one of the stars in a binary-star system.

Alan Boyle says: We're used to seeing spiral galaxies in deep space, but other types of outer-space spirals are positively spooky. Astronomers say that this whirligig, more than 3,000 light-years away in the constellation Pegasus, has been created by material spewing out from a binary-star system like water from a lawn sprinkler.

The Hubble Space Telescope spotted the swirl around LL Pegasi, also known as AFGL 3068, several years ago. There's a thin spiral pattern of star stuff winding around the central star, which is hidden from view by thick dust. Observations from Hubble as well as the Keck II telescope in Hawaii indicate that LL Pegasi actually consists of two stars in a tight orbit around each other. Astronomers theorized that one of the stars was spewing material outward in the course of making its rounds.

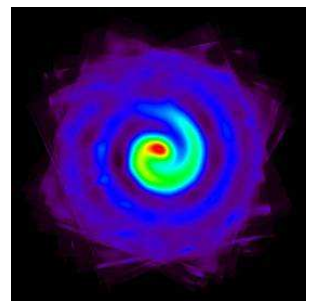


When the astronomers calculated what kind of orbit would produce the spiral pattern, they came up with an estimate of 800 years per orbit which turned out to be a close match for the time they think it takes the decomposing star to make one circuit. The spiral of dust, designated IRAS 23166+1655 is known as a pre-planetary nebula. That's not because the nebula is about to form infant planets, but because the phenomenon is seen as the prelude to the star system's death. When a sunlike star nears the end of its life, it puffs away its outer layers of gas and dust, creating beautiful shells in the process. "IRAS 23166+1655 is just starting this process, and the central star has yet to emerge from the cocoon of enveloping dust," the European Space Agency's Hubble team says in Monday's "Picture of the Week" advisory. Such objects are known as "planetary nebulas" because when English astronomer William Herschel spotted them in the late 18th century, he compared their roundish shape to that of a planet. That's a shape he knew from experience, as the discoverer of Uranus.

The weirdly regular spiral of IRAS 23166+1655 may not be all that similar to a planet's shape, but it does look like a few other pinwheels that have been seen in outer space. One example is WR 104, the so-called "Death Star" that's 8,000 light-years from Earth and just might blow up one of these days. (But don't worry: Astronomers say it won't kill us.)
WR 104



Right: Peter Tuthill / Univ. of Sydney A near-infrared image from the Keck telescope shows the pinwheel shape created by the WR 104 star system.



The other spiral that comes to mind is the unidentified flying object that was sighted over Norway last December. Some observers wondered if the glowing spiral shape was a warning signal from visiting aliens, or even a tryout for a holographic sky-hoax system dubbed Project Bluebeam. But the spiral pattern turned out to be the result of rocket fuel spewing from a wayward Russian booster.

Russian spiral

Left: Dagfinn Rap via Space.com Norwegians had front-row seats for last December's space spiral and green streak.

Compared to a Death Star and a runaway Russian missile, a pre-planetary nebula in Pegasus sounds positively charming "and sure enough, the celestial spiral is going viral.

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Spooky Quantum Entanglement Disturbed – October 8/10 credit LiveScience.com

Physicists have long been puzzled over a mystical link between particles called entanglement—and now they've established this bizarre connection in a new experiment.

When two or more particles are entangled, they retain a connection even if separated across an entire galaxy. If an action is performed on one particle, its linked partner will also respond.

Amazingly, entanglement has actually been proven to occur, though lab tests haven't established it out to anything like galactic distances, yet. (When Albert Einstein's calculations suggested the theoretical possibility of entanglement, he was so alarmed he dubbed it "spooky action at a distance.")

In a recent study, a research team entangled four particles together under disturbing conditions to see whether they would keep that connection or break loose.

Probing entanglement like this will not just provide scientists with more information about the freaky ways our world works, but also help them understand behavior of entangled particles as ingredients for superfast quantum computers.

In the new study, researchers entangled four calcium ions (atoms with one missing electron, leaving them positively charged). They did this by exposing the ions to specially calibrated laser light while the ions were moving in a particular pattern. The light imparts a small blast of energy to the ions, causing their electrons to jump from one energy level to the next, leaving all the atoms in a matching entangled state.

Then the entangled particles were exposed to a "noisy" environment, where laser light was present that could potentially disturb their connections.

"We found that as you introduce noise there is a point where you can still have entanglement, but noise interferes with the useful properties of entanglement," said lead author Julio Barreiro of the Institute of Experimental Physics of the University of Innsbruck in Austria. "The environment causes these correlations to decay."

This is useful knowledge for designing quantum computers, he said, because such laser noise would likely be present.

"This is relevant because for many calculations that rely on entanglement, they rely on it being robust against noise," Barreiro told LiveScience. "But there are other approaches that will avoid these problems. There are other ways of programming a quantum computer that make it resistant to sources of noise."

Given recent advances in entanglement science, Barreiro said it may be as little as 10 or 20 years before scientists can create a functional quantum computer able to process many times more information at significantly faster speeds than normal computers.

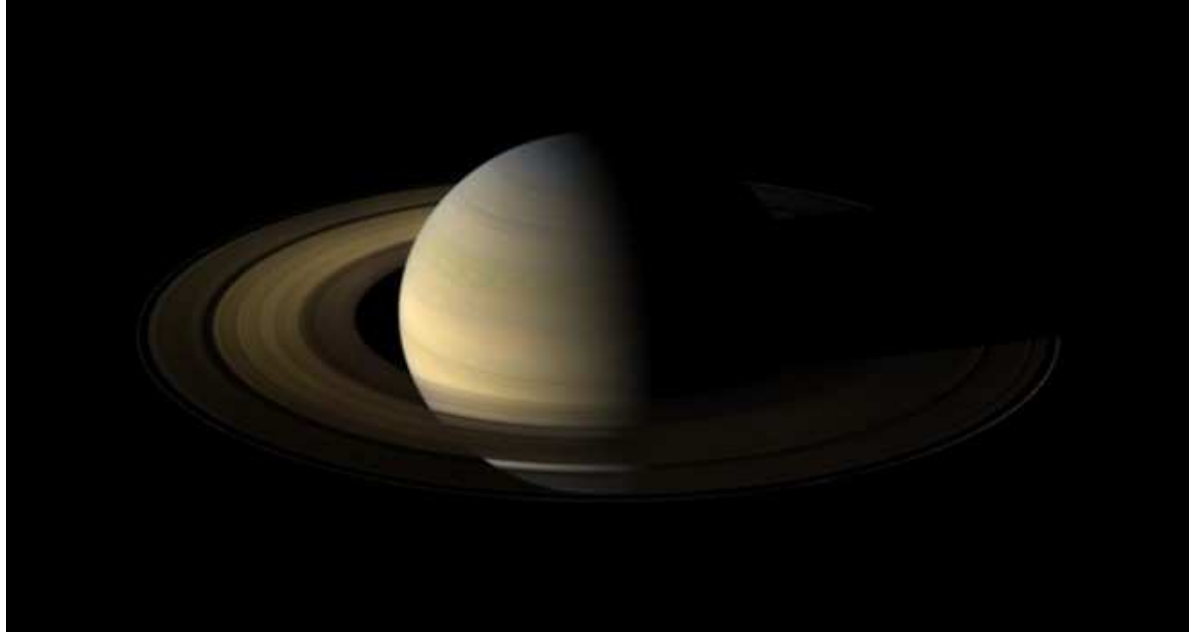
"Right now for example we are building one that will factorize $15 - 3$ times 5 ," he said. "That's how basic we are. But of course if you prove you can do this in a scalable system, then it can be extended to bigger numbers."

The researchers reported their findings online in the journal Nature Physics.

- [Twisted Physics: 7 Recent Mind-Blowing Findings](#)
- [Album - Behind the Scenes at the Largest U.S. Atom Smasher](#)
- [Einstein's 'Spooky Physics' Gets More Entangled](#)

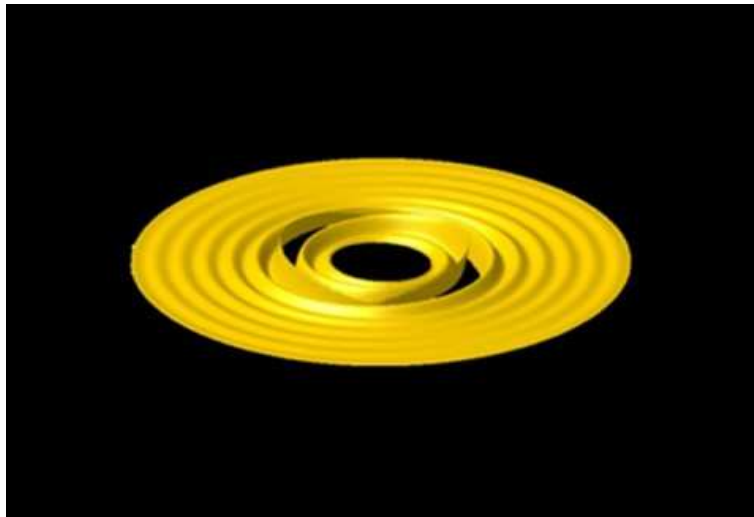
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Titan Raises Tsunamis in Saturn Ring— Oct 4/10 credit NASA/JPL/Cornell



A crack in one of Saturn's rings could be held open by the planet's largest moon, Titan. A new analysis of data from the Cassini orbiter shows that Titan's gravity lifts part of the ring in a rotating tidal wave almost two miles high.

"It's a little bit like a tsunami propagating away from an earthquake fault," said planetary scientist Phillip Nicholson of Cornell University in a press briefing Oct. 4. Nicholson presented a new model explaining the ring gap at the American Astronomical Society's Division for Planetary Sciences meeting in Pasadena, California.



Saturn's rings are riddled with gaps, many of which are held open by small moons. But in the last five years, since Cassini discovered the moon Daphnis, no new moons have shown up in the other known fissures. "It's become an increasing problem, as to what determines where these gaps are in the rings and what keeps the gaps open," Nicholson said.

One such gap has been a mystery since the Voyager 1 spacecraft flew by Saturn in the 1980s. Using radio observations, Voyager detected what looked like a 9-

mile-wide gap in the middle of Saturn's C ring. Just outside the gap, astronomers saw a wave-like structure circling the ring, which they interpreted as an extra-clumpy region pushing through the ring's flat disk. But Cassini found the gap to be much narrower, only about a mile and a half wide. Even weirder, the gap seemed to disappear about half the time. Both puzzles can be resolved by thinking of the ring in three dimensions, Nicholson says. Last year, the angle of sunlight during Saturn's spring equinox revealed that many of Saturn's rings have mountains. "Mostly the rings are very flat. It's the most two-dimensional structure we know in the universe," Nicholson said. "But there are exceptions to every rule, and there are exceptions to the rule that Saturn's rings are flat everywhere."

The new model suggests the actual gap in the ring is only about a third of a mile wide, but part of the ring rises 2 miles in the air. The crack looked wider to Voyager than to Cassini because of the angles the spacecraft were observing from. "In hindsight, what looked like a 15-kilometer-wide gap actually was this gap with a vertical displacement of about 3 kilometers (1.8 miles), projected and seen

almost edge-on," Nicholson said. "If we assume this was vertical and not horizontal and do the projection, it fits perfectly with this model, better than you have any right to expect." The ring's corrugation comes from a gravitational relationship with Titan, whose orbit around Saturn falls at a slight angle to the ring plane. At a certain point in its orbit, Titan yanks the ring particles upward, starting a wave that travels around the ring.

"The whole pattern rotates around at the same rate as the satellite Titan orbits Saturn, once every 16 days," Nicholson said. The wave rolling along under Cassini occasionally blocked the spacecraft's view. "That accounts for the fact that the gap seems to come and go," he added. This sort of wave could explain some of the other gaps in Saturn's rings that are not held open by moons, although it could also be unique to Titan and the C ring, Nicholson said. "This and some other work suggests there might not be one explanation for gaps, there may be three or four or even more different dynamical circumstances that can give rise to these gaps."

The insights gleaned from Saturn's rings can be applied to disks all over the galaxy, including disks around stars that will eventually coalesce into planets, added Linda Spilker, Cassini deputy project scientist at the Jet Propulsion Laboratory. "Saturn really is a wonderful, natural lab for understanding how the protoplanetary nebula might have evolved," she said.

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10 Strange and Amazing Astronomy Facts— credit About.com Guide

Even though man has studied the heavens for thousands of years, we still know very little about the Universe we live in. And as we continue to learn more, we are consistently amazed, and sometimes confused, by what we learn. Here is a collection of amazing, interesting, and strange astronomy facts, in no particular order.

- Scientists believe that we can only see about 5% of the matter in the Universe. The rest is made up of invisible matter (called Dark Matter) and a mysterious form of energy known as Dark Energy.
- Neutron stars are so dense, that a soup can full of neutron star material would have more mass than the Moon.
- The Sun produces so much energy, that every second the core releases the equivalent of 100 billion nuclear bombs.
- Galileo Galilei is often incorrectly credited with the invention of the telescope. Instead, historians now believe the Dutch eyeglass maker Johannes Lippershey as its creator. Galileo was, however, probably the first to use the device to study the heavens.
- Black Holes are so dense, and produce such intense gravity, that even light cannot escape. Theoretical physicists predict that there are situations under which light can escape (which is called Hawking radiation).
- Light from distant stars and galaxies takes so long to reach us that we are actually seeing objects as they appeared hundreds, thousands or even millions of years ago. So, as we look up at the sky, we are really looking back in time.
- The Crab Nebula was produced by a supernova explosion in 1054 A.D. The Chinese and Arab astronomers at the time noted that the explosion was so bright, that it was visible during the day, and lit up the night sky for months.
- Shooting stars are usually just tiny dust particles falling through our atmosphere. Comets sometimes pass through Earth's orbit, leaving trails of dust behind. Then as Earth plows through the dust in its path, the particles heat up, creating the streaks in the night sky.
- Even though Mercury is the closest planet to the Sun, temperatures can reach -280 degrees F. Why? Since Mercury has almost no atmosphere, there is nothing to trap heat near the surface. So, the dark side of Mercury (the side facing away from the Sun) is very cold.
- Venus is considerably hotter than Mercury, even though it is further away from the Sun. The thickness of Venus' atmosphere traps heat near the surface of the planet.

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What Doesn't Kill You Makes You Stronger—Oct 5/10 credit OneMinuteAstronomer



Modern astronomical observatories are located on barren far-away mountaintops with dry, thin, freezing-cold air. But modern astronomers travel in relative comfort to get to these observatories. Air travel is fast, frequent-flier lounges are plush, and food and lodging at major observatories rival those of a comfortable hotel. And once observing is done, an astronomer can fly home in a day to join colleagues for lunch at the faculty club.

But in 1760, it was different.

In these early days of the Age of Reason, traveling astronomers braved war, stormy seas, and deadly tropical disease to reach their destinations. And they were often away from home for several months, or even a couple of years.

But no astronomical expedition comes close to matching the epic hardship and back luck that fell upon the French astronomer Guillaume le Gentil, who braved eleven years of travel around the Indian Ocean in an attempt to observe the transit of Venus across the Sun's disk.

The transit of Venus was a huge deal in the 18th century. Fifty years earlier, Sir Edmund Halley worked out a method to figure the distance from the Earth to the Sun by measuring the time it took for Venus to pass across the Sun's disk from various parts of Earth. Once the distance from the Earth to the Sun was known, astronomers could calculate the distance to other planets in the solar system, and perhaps even to nearby stars. This was turning point in human understanding of the universe.

But a transit of Venus is a rare event, occurring at eight-year intervals just once per century. One transit was to occur on June 6, 1761 and another on June 4, 1769. Guillaume le Gentil was dispatched in March, 1760 at the request of the French Academy of Sciences to observe the transit from the French colony at Pondicherry, India. He was one of hundreds of European astronomers who traveled across the world to observe the transit. le Gentil sailed around the Cape of Good Hope to what's now called Mauritius, and waited months to secure a ride on another ship to Pondicherry. He found a ship. But while enroute he discovered the British, who were at war with the French, had seized Pondicherry and he would have to return to Mauritius. The transit of Venus occurred when he was still at sea, and while he observed the event, he obtained no useful measurements on the moving ship.

He knew the next transit was eight years away, so he stayed in Mauritius and nearby Isle de Bourbon (now called Reunion Island). He mapped the coast of Madagascar, learned about indigenous culture, and collected samples of the natural history of the region. He planned carefully for the next transit, determining that Manila was the best nearby place to see it. He found a Spanish ship to take him to Manila. And he looked forward to returning to Europe eastward from Manila past Mexico and around South America, completing his trip around the world.

le Gentil arrived in Manila in March, 1766 to prepare for the transit. But he was not welcome by the Spanish governor of the colony. Seeking council from France, he was advised to return to Pondicherry to avoid trouble with the Spanish. He could have refused, but he believed India had a better chance of clear skies during the event. Once back in India, he calibrated his instruments and enjoyed a month-long spell of perfectly clear skies before the transit. But on the morning of June 4, 1769, just as the transit of Venus began, the sky filled with clouds for a few hours, just long enough for le Gentil to miss the entire event. He later learned that his colleagues in Manila enjoyed the transit under perfectly clear sky.

This was all too much for le Gentil, and his bad luck sent him to the brink of insanity. At the very least, he was exhausted by years of hard travel and wished to return home. So late in 1769, he pulled himself together, packed his equipment, and set sail for France.

But his troubles were not over. In early 1770, before leaving Pondicherry, he contracted dysentery. Determined to press on, he set sail in March 1770, still quite sick. His illness at sea was overwhelming, so he landed again in Mauritius to recover, where among other events, he watched a valued colleague die of tropical fever. But le Gentil recovered his health and secured a place on a trading ship to return to France in July. The ship delayed sailing until November—hurricane season—and first set eastward from Mauritius to Reunion Island instead of westward around the Cape of Good Hope

towards Europe. The ship was caught in a massive storm in early December, when its rudder was badly damaged and its mast nearly sheared off. The ship back barely made it back to Mauritius on January 1, 1771.

The hapless le Gentil almost gave in to despair. But he persisted, and in March 1771 he gained berth on a Spanish ship which was repeatedly delayed by more storms near the Cape. He rounded the Cape in May, and after many tense encounters with English and Spanish ships, who were preparing for war with France, finally landed in his home country on October 8, 1771 after enduring an absence of eleven years, six months, and thirteen days to observe an astronomical event that lasted about six hours.

Ah, to be home! Given le Gentil's abnormally long absence and lack of correspondence, his countrymen were shocked to see him alive. And so, apparently, was his family. While he was away, his wife had remarried and his relatives declared him dead and ransacked his estate. What's more, he lost his place in the French Academy of Sciences, the same institution that sent him on his odyssey in the first place.

It took years of litigation and the intervention of the King of France to set things right. But le Gentil resumed a normal life. He remarried, regained his position in the Academy, and lived for another 21 years. And as with most trips gone awry, the pleasure lies not in the trip itself but in the telling of tales after returning home. He immortalized his adventures in his two-volume memoir "A Voyage in the Indian Ocean".

While le Gentil enjoyed robust health in his later years, he died of a sudden serious illness in 1792 at the age of 67. He was, at least, saved from the escalating horror of the French Revolution, which did not treat kindly the French Academy and its members.

Aside from his epic story, which has been retold for more than two centuries, le Gentil is also remembered by a crater on the Moon and by a large dark nebula in Cygnus near the Northern Coalsack. He was also the subject of a play by Canadian writer Maureen Hunter in 1992.

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7. Buy and Sell

Here's your chance to clean out the closet and find a home for your slightly used treasures. Post your buy and sell items by emailing the [Editor](#) with your details.

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

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



DEAL PENDING

George Ball Observatory is looking for a new home



The RASC Society is offering this astronomical observatory at NO COST to a good home.

The building will require a proper concrete foundation and slab. Due to its size and weight a commercial crane and trailer assembly will be required to lift and deliver it to a new site at the new owners expense. Crane costs and construction work are estimated to be in the \$2,500 to \$3,000 range. Serious inquiries are welcomed. For an appointment to view please contact : Bruno Quenneville at (250) 477-2257

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8. Ask an Expert

Have you been thumbing through the Astronomy or Sky and Telescope magazine and have some questions on the latest and greatest in astronomy gear? Or maybe you're narrowing down your search for just the right telescope and want to know the difference between Dobsonians, Schmidt-Cassegrains, Reflector and Refractors. Well wonder no more, email [Brian Robilliard](#) our resident expert to get the "inside scoop" on what's hot or not in astronomy gear.

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 [Byron Thompson](#) our Editor and master of Astronomy 101 basics.

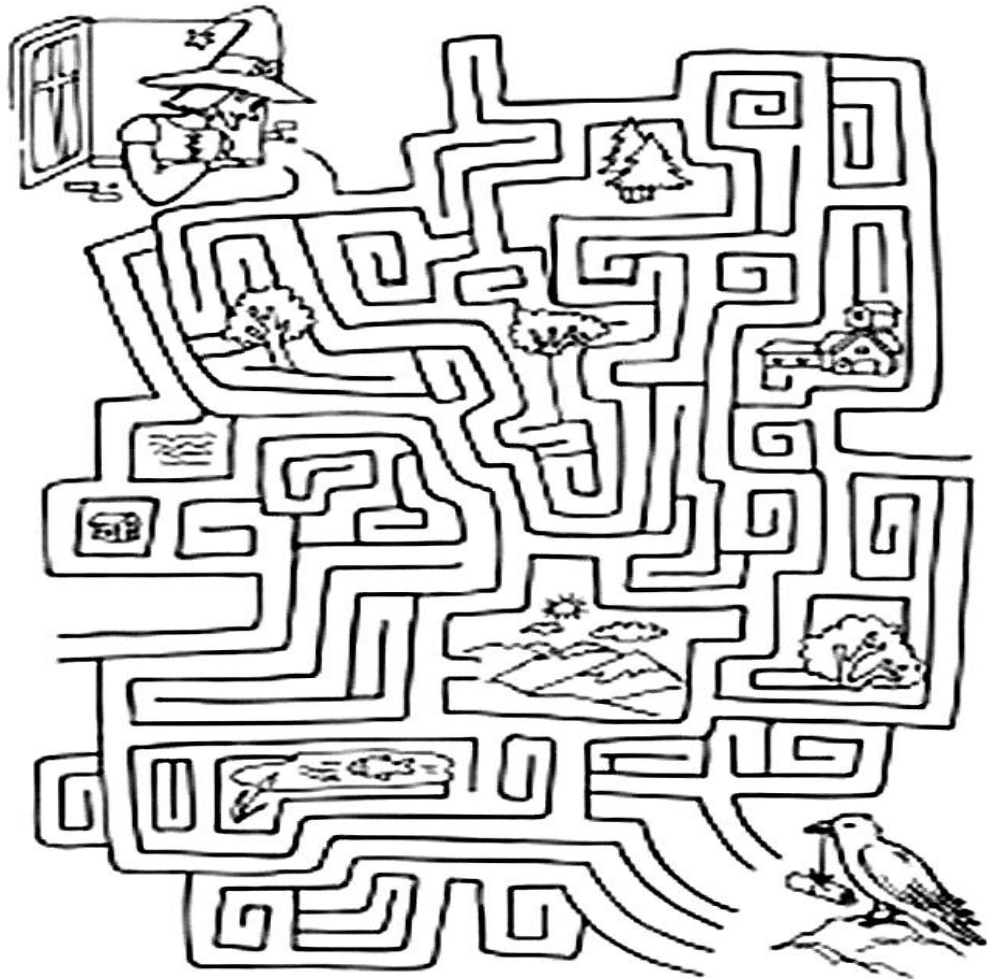
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9. Kids Korner

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

This month is all about "spooky" and on that note, we thought you may enjoy trying your luck to:

Send a Message to the Witch! Credit www.ActivityVillage.co.uk - Keeping Kids Busy



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10. The Sky This Month

By Bryon Thompson

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

The temperatures are slowly dropping but the nights are getting darker and a little clearer especially now that last month's rainy weather is a thing of the past. This month is Jupiter month. The big planet dominates the night sky shining at magnitude -2.9 making it the brightest object in the night sky. Even though Jupiter reached opposition and hence best visibility last month it is still a very pleasing object to see through the eyepiece of even the most modest sized telescope. Jupiter's extremely fast rotational period causes the planet to be a little more than 3" wider than it is tall; a feature that is easily seen with almost any magnification. This fat little giant provides us with some interesting things to look for this month. One of the first things you may notice is that something is missing. The Southern Equatorial Belt is gone! The SEB used to look as wide and dark as the Northern Equatorial Belt, as a matter of fact both belts were well known prominent features on the face of the planet, but for some strange reason the southern one has all but disappeared. The SEB now appears as a slim faint ghost of its previous self. The dark belts are deeper warmer layers of clouds and scientists are not sure why the SEB has faded from view but some believe that the white clouds of cooler higher gas may have covered it up. We do not know when the SEB will reappear but it is believed that it will as it has disappeared and reappeared before. One of the other popular things to watch for are the shadows of three of the four big moons that circle Jupiter as they pass across the planets cloudy face. One such event happens at the end of October on the night of the **30/31**. Both Ganymede and Europa will transit the planet starting before Jupiter is visible to west coast observers **at 05:21pm. PDT and 07:26pm PDT** respectively. The good stuff happens however at **09:09pm PDT** when Ganymede's dark shadow starts to cross the bright eastern cloud-tops of the big planet. Seven minutes later Europa's shadow joins the show and the two dark spots are clearly visible against the backdrop of the lighter clouds. The show continues until Europa's shadow passes back into the depths of space at **11:59pm PDT** and Ganymede's shadow follows, completing its transit at **12:07am PDT**.

Uranus is an easy target this month as well. If you are out looking at Jupiter put your telescope aside and grab your binoculars and look a few moon-widths to the north east of Jupiter to see this magnitude 5.7 blue/green dot. Check your star maps to make sure you're not looking at 20 Piscium which is similar in brightness. If you take a look through a telescope at medium magnification you can make out a disc 3.7" in diameter. Don't let its apparent small size fool you however; Uranus is a large gas giant five times further away than Jupiter is. It lies 1.8 billion miles distant or a little more than two and a half "light hours" away.

Our furthest planet, Neptune can be found in the southern sky but you need some help to find it. Neptune glows faintly at magnitude 8 just below the range of naked eye observing. With bino's or a telescope, look near the north eastern corner of Capricornus the Sea Goat. About 3° northeast of the bright star Delta Capricorni you can see Neptune's distant blue/grey glow in the same binocular field of view. With your star map grab your telescope and you can find Neptune 0.2° North of faint Mu Capricorni. With a power of about 100X you should be able to resolve Neptune to a 2.3" disc.

Saturn is back but is disappointing at best. After reaching conjunction last month Saturn appears in the morning sky and by month's end will rise about 2 hours before the sun. It shines at magnitude 0.9 in the south east but is too low on the horizon for any telescopic viewing. It will improve in the months to come.

Both Venus and Mars are lost in the evening twilight and only then are visible if you have an unobstructed view of the western horizon; something few of us here on the west coast possess. If you do have that rare view it is hard to miss the 'beacon' planet as it shines at magnitude -4.8, one hundred times brighter than any evening star. Be careful of your eyes however as our bright sister is very close to the blinding light of the setting sun. Venus is getting lower on the horizon in fact as it sinks toward inferior conjunction when it will move between the earth and the sun.

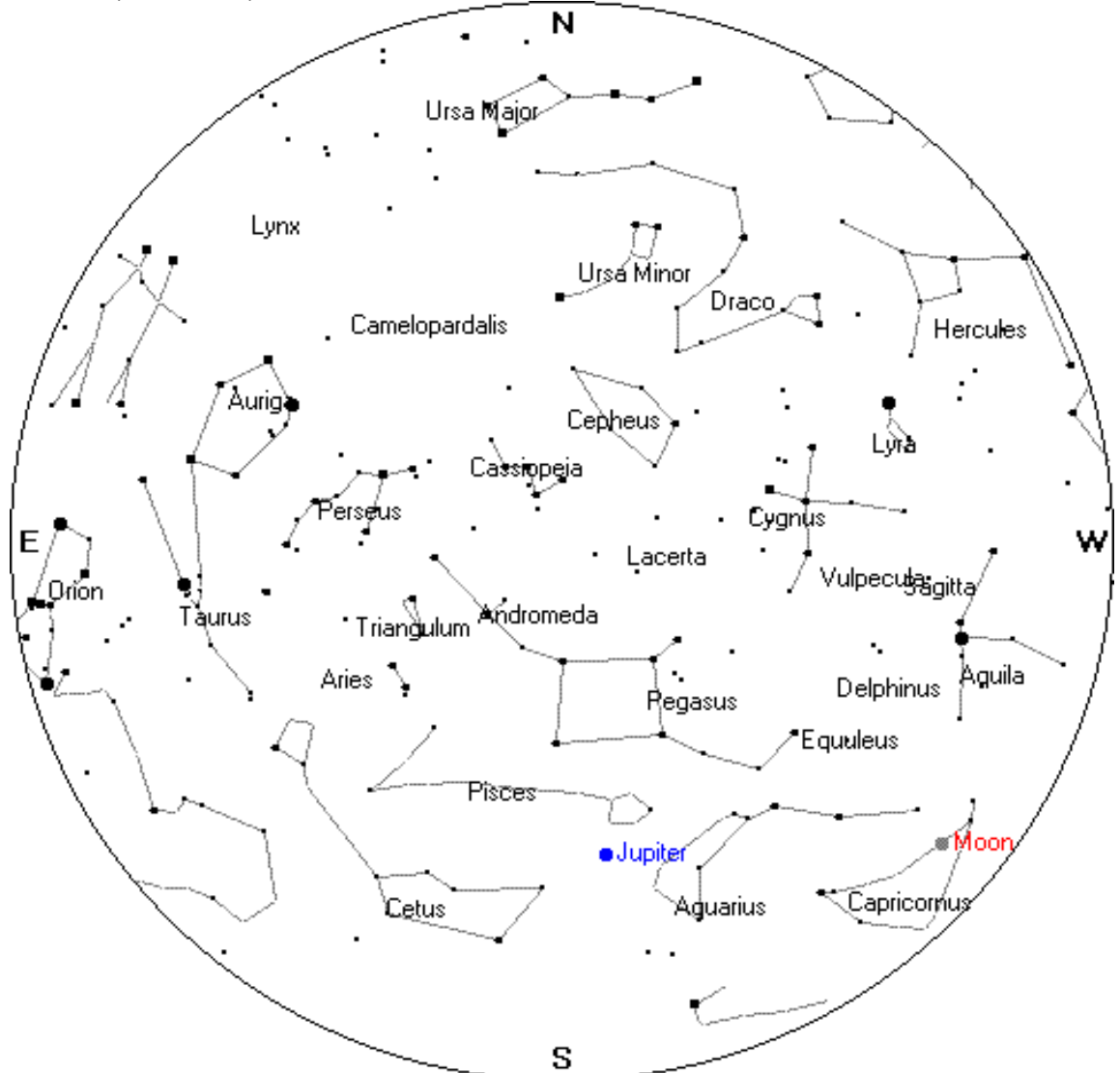
The Orionid meteor shower peaks before dawn on the morning of the **21st**. The moon however is there to upstage this show and take over the night sky. With the full moon only a day away there will be too much light in the sky to see all but the brightest of meteors. Remember that the dust motes that do make it through the glare are coming from the well known comet 1P/Halley. Although Halley's Comet last appeared in the night sky in 1986 and was less than spectacular, if you were around to see the famous comet be thankful; its next visit is in 2061. I hope you get a chance to enjoy its dusty leftovers!

If you don't get to see many meteors you may get a good look at another starry night performer. Comet 103P/Hartley is bringing its spooky green glowing coma into view nearer to the end of the month. Look high in the north east just below Cassiopeia for a 5th magnitude glow with a faded tail. It can be found next to the double cluster in Perseus on October 9th. Best viewed through binos or a telescope the comet should be visible to the naked eye more and more as the month progresses. It will move through to Gemini by month's end. As we get closer to Halloween this little green witch will slowly streak across our sky on her broom-like tail. Be sure to go someplace dark to get the best views ...but watch your back! OH what was that noise! Oooh sometimes this night time pastime is a little scary!

Till next time, remember, astronomy is looking up!

Oct 7	11:44 AM PDT	New Moon
Oct 14	02:27 PM PDT	First Quarter Moon
Oct 21	evening	Orionid Meteor Shower Peaks
Oct 22	06:37 PM PDT	Full Moon
Oct 28	06:00 PM PDT	Venus is in inferior conjunction
Oct 30	05:46 AM PDT	Last Quarter Moon
Oct 30	Evening to 31st	Ganymede and Europa shadow transits

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



SkyChart Courtesy of Heavens-Above