COWICHAN VALLEY STARFINDERS ASTRONOMY CLUB

Clear Skies

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Categories

Quick Links

Greetings!

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

Well "better late than never" was what my mother always said and I perceivered to get your November newsletter done with this sentiment in mind.

With cooler weather comes better viewing and a wonderful opportunity for club members to get together and do some stargazing. Let's try and get a group together, for more info see the "Upcoming Events" section of this newletter.

I hope you all had a great halloween, we sure did! We had some dear friends sneek over and give us a good scare. Speaking of halloween check out our president's article on "Autumn Ghosts" in the featured articles.

If you haven't had a chance to see comet Holmes you still have time, check out the "Sky This Month" for an up-to-date report from our Educational Director.

Many thanks to this month's contributers: Moe Raven, Norm Willey and Bryon Thompson.

Freda Eckstein

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

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Meeting Highlights

Our monthly meetings are held the **first Tuesday** of every month at the CMHA Office, 371 Festubert St in Duncan. Start time is 7:30pm.

The next meeting will be on Tuesday, Nov 6, at 7:30 hope to see you all there.

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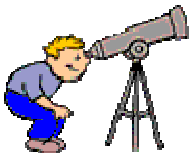
Upcoming Events

Observers Night



We would like to reinstate the observing sessions and are looking for a good location where club members can gather to view and socialize on a regular basis. If anyone has suggestions for a good location, please email the president at president@starfinders.ca.

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Web News

Astronomers Select Top Ten Most Amazing Pictures Taken by Hubble Space Telescope in Last 16 Years check it out at: Astronauts Hubble-top-10

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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"

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Featured Articles

Articles

RETURN TO CATEGORIES

1. Earth-Like Planet Forming on our Doorstep
2. Allen Telescope Array Begins
3. Ulysses Catches Record for Catching Comets by Their Tails
4. An Autumn Ghost
5. Solar Telescope Reaches 120,000 Feet on Jumbo Jet-Sized Balloon
6. Catch a Comet - No Telescope Required

Earth-like Planet Forming on our Doorstep– Oct 4/07 credit Agençe France-Presse

An earth-like planet seems to be forming some 424 light-years away, snuggled into a huge belt of warm dust, scientists say.

At somewhere between 10 and 16 million years old, the planet's solar system is still in its "very young adolescence", but is at the perfect age for forming earth-like planets, says lead researcher Dr Carey Lisse of Johns Hopkins University's Applied Physics Laboratory.
Lisse, with colleagues from the US, UK and Japan, will publish their find in the Astrophysical Journal.

A binary system where astronomers suspect a rocky earth-like planet is forming around one of the stars. The brown ring depicts a huge belt of dusty material, more than 100 times as much as in our asteroid belt, enough to build a Mars-size planet or larger. The white outer ring shows a concentration of icy dust *(Image: NASA/JPL-Caltech/JHUAPL)*

The massive dust ring surrounding one of the system's two stars is smack in the middle of the system's habitable zone where water could one day exist on a rocky planet.

These types of dust belts rarely form around sun-like stars and the presence of an outer ice belt makes it all the more likely that water, and subsequently life, could one day reach the planet's surface.

The belt is made up of rocky compounds similar to those which form our earth's crust and metal sulfides similar to the material found in the earth's core. "It's just the right stuff to be making an earth," Lisse says. "It's exciting to think that this is happening." Not that Lisse will be around to see much of it.

The images captured by NASA's Spitzer Space Telescope are about 424 years old, but that's barely a blink in the eye of the young planet. It will likely be about 100 million years before the planet is fully formed. And, if our planet is anything to go by, about a billion years before the first signs of life such as algae appear, Lisse says. The evolution of complex organisms such as dinosaurs will probably take another couple of billion years if the new planet follows a pattern similar to ours, he adds. "We've got a long time to go," he says. But the images captured have

helped Lisse and his colleagues understand a lot about how an earth-like planet could form.

While mathematical models can be created to extrapolate what will happen to this particular system, even more can be learned if astronomers continue to probe the universe for other earth-like planets at various stages of development. "For me, this is all part of the big story of how we got here," Lisse says.

The next step in studying this particular system will be to try to capture more images of it to see if gas-like planets, such as Jupiter and Saturn, have already formed and to get a more detailed look at the contents of the dust and ice belts. Right now, the planet in the system known as HD113766 is growing as dust grains clump together to form rocks and these rocks collide to form larger bodies, some as big as our own moon.

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Allen Telescope Array Begins – Oct 16, 2007credit Astronomy.com

Today, the University of California, Berkeley and the SETI Institute announced that the first 42 radio dishes of the Allen Telescope Array (ATA) are activated and collecting scientific data from the far reaches of the universe. This is the first phase of a planned 350 radio dishes that will advance the capabilities of radio astronomy research. Paul G. Allen, Microsoft co-founder and philanthropist whose foundation donated seed money that started the project in 2001, joined representatives of UC Berkeley and the SETI Institute to launch the array.

"This is a great day for the science of radio astronomy and the study of the cosmos," said Leo Blitz, UC Berkeley professor of astronomy and director of the university's Radio Astronomy Laboratory, which is building the ATA with the SETI Institute. "Thanks to a unique intersection between the best in science, advanced, innovative technology and bold philanthropy, many secrets of the universe are a little closer to being revealed."

"This project represents a potential breakthrough in building large arrays of radio telescopes that are extremely cost effective," said Paul G. Allen, primary funder of the ATA. "As now deployed and with plenty of room for growth in the future, the telescope can fulfill a multitude of uses, including broad radio sky surveys and the search for evidence of extraterrestrial technology. I'm pleased to be able to contribute to such an important advancement and help build on the work this new telescope will do in the future. My hat is off to the team that worked so hard these last seven years to accomplish this significant milestone."

Every object in space emits radio waves that can be collected and studied. From observation of these signals, radio astronomers can create a picture of astronomical bodies and events at great distances, revealing detail not discernable by telescopes operating at other wavelengths. The ATA will acquire data in a new way, imaging a large piece of the sky at once. What sets the ATA apart from earlier radio telescopes is its ability to collect and, analyze more information about celestial objects, and do this simultaneously for several projects. In addition, observational surveys can be made with greater speed than any previous or existing radio device.

"For SETI, the ATA's technical capabilities exponentially increase our ability to search for intelligent signals, and may lead to the discovery of thinking beings elsewhere in the universe," said astronomer Seth Shostak of the SETI Institute in Mountain View, Calif. "It is the first major telescope in the world built specifically for undertaking a search for extraterrestrial intelligence."

The ATA opens the doors to a new era of scientific progress. The telescope's potential discoveries include a better understanding of exploding stars (supernovas), black holes, and new, exotic astronomical objects that are predicted but not yet observed. It will also provide expanded search capabilities to determine if intelligent civilizations have evolved around other stars. The ATA is the first panchromatic, wide-angle, snapshot, radio camera ever built. It is the most effective tool to create radio images of a vast area of the sky ever placed

in the hands of researchers.

Located in an arid valley near the town of Hat Creek, just north of Lassen Volcanic National Park in northern California, the new array is already collecting important data. The first test images, released today from data gathered by the 42 ATA telescopes, include a radio map of the nearby Andromeda Galaxy (M31) and the Triangulum Galaxy (M33).

Beyond its speed and ability to both garner and analyze data, the ATA is also the first centimeter wavelength radio telescope with the ability to multi-task. While making innovative observations for radio astronomy, it can simultaneously interrogate solar-type stars for artificially produced signals that would reveal the presence of extraterrestrial intelligence.

This new capability increases many-fold the time astronomers can devote to large-scale surveys of the stars, as well as expanding the radio frequency band over which they can search. For SETI, in particular, this means that over the next two-dozen-years, the ATA will get a thousand times more data than has been accumulated in the past 45 years.

The ATA uses mass-produced, 20-foot diameter radio dishes and commercial telecommunications technologies combined with an innovative receiver design, and state-of-the-art digital signal processing technology. Working together, these small dishes create a telescope with a wide field of view ideally suited to rapidly surveying the sky. The layout of the 42 dishes was created by a computer model and is optimized to provide high quality radio imagery of the sky. The ATA can also filter out noise from man-made interference that in many radio telescopes would render much of the data unusable. The array can be easily upgraded as new advances in computer or telecommunications technology become available.

The total cost of the project to date, including research, development and construction costs for the array and the necessary radio astronomy and SETI signal detectors, is $50 million. The first phase of this project was funded through generous grants from the Paul G. Allen Family Foundation totaling $25 million. UC Berkeley, the SETI Institute, the National Science Foundation, Xilinx, Nathan Myhrvold, Greg Papadopoulos, and other corporations and individual donors contributed additional funding. Both UC Berkeley and the SETI Institute are engaging in additional fundraising efforts to complete the full 350-dish array.

The full 350-dish array, when completed in approximately three years, will have unprecedented research capabilities. Capitalizing on constant advancements in computer technology, the ATA will be manufactured at a fraction of the cost of traditional instruments. The ATA team is prepared to install more dishes as additional funding is secured.

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Ulysses Catches Record for Catching Comets by Their Tails– Oct 22, 2007 credit NASA

When it was launched 17 years ago, scientists and mission engineers for the Ulysses project knew they should expect, well, the unexpected. After all, the joint NASA/European Space Agency-managed spacecraft was going where no spacecraft had gone before - above and below the sun's poles. But the surprises the team expected were wholly in the area of solar research - which would make sense, as the primary mission of the Ulysses spacecraft is to characterize the sun and its influence on the space environment. That was before the spacecraft met up with some of the solar system's most mysterious and beautiful deep-space nomads.

"Ulysses has flown through and acquired data from the tails of comets on three separate occasions," said Edward J. Smith of NASA's Jet Propulsion Laboratory in Pasadena, Calif. Smith serves as the U.S. project scientist for the Ulysses mission. "No other spacecraft in history has done that."
Ulysses' first cometary tail encounter occurred in 1996. Back then, comet

Hyakutake was dazzling scientists and the public alike with its noteworthy appearances in the nighttime spring sky. On May 1, 1996, while Ulysses was cruising through space studying the solar wind, its data suddenly went wild for a few hours.

"As we were not looking for comets, we did not realize the significance of the data right away," said Smith. "The solar wind seemed to almost disappear and was replaced by gases not normally found in the solar wind, and the magnetic field in the solar wind was distorted."

At the time of the unexpected encounter, Ulysses was hundreds of millions of miles from comet Hyakutake and far beyond the visible tail. As their analysis began ruling out other possibilities, the science team came to a startling conclusion - Hyakutake's tail extended more than 480 million kilometers (300 million miles, or three times the distance from Earth to the sun), making it the longest comet tail ever recorded.

The once-in-a-lifetime chance encounter with a comet tail happened again in 2004 when Ulysses flew through the ion tailings of comet McNaught-Hartley. Unlike Hyakutake, comet McNaught-Hartley seemed to be at the wrong location for Ulysses to intercept its tail. By chance, an eruption of particles from the surface of the sun, called a coronal mass ejection, carried cometary material to Ulysses. Such a collision has recently been observed for the first time by NASA's Stereo spacecraft (http://www.nasa.gov/mission_pages/stereo/news/encke.html). A movie (http://www.nasa.gov/mpg/191284main_encke_scienceatnasa.mpg) shows the disruption and reformation of periodic comet Encke's tail.

Ulysses racked up its third, and perhaps most scientifically revealing, comet tail encounter this past February when it again flew through the ion tailings of a comet named McNaught (a different comet than the one encountered in 2004, but discovered by and named after the same astronomer). The nucleus of this comet McNaught was some 257 million kilometers (160 million miles) from the spacecraft during encounter. Ulysses' solar wind ion composition spectrometer instrument, developed by University of Michigan heliophysicist George Gloeckler, found that even at such a great distance, the tail had filled the solar outflow with unusual gases and molecules. In response, the solar wind that usually measures about 700 kilometers per second (435 miles per second) at that distance from the sun, was less than 400 kilometers per second (249 miles per second) inside the comet's tail, as measured by one of Ulysses' instruments called "Solar Wind Observations Over the Poles of the Sun."

The interaction between comets' tails and the solar wind has been studied for decades. A comet's ion tail always points away from the sun, whether the body is traveling toward or away from the sun along the comet's elliptical orbit. It was this finding that eventually led in 1958 to the discovery of solar wind. The magnetism and velocity of the solar wind are so strong; the effect pushes the comet's tail forward. A paper on Ulysses' latest crossing of a comet tail was published in the Oct. 1 issue of Astrophysical Journal.

"I recall saying a few years back that the odds that Ulysses' flight path would intersect that of a comet tail were probably less likely than finding a needle in a haystack," said Smith. "Now that we have encountered three, I cannot help wondering when nature will have another one in store for us."

Smith is part of an international science team that has been working Ulysses data since its 1990 launch from the payload bay of Space Shuttle Discovery. Ulysses scans the sun's magnetic field, solar plasmas, solar radio noise, energetic particles, galactic cosmic rays and cosmic dust between the poles and the equator - imparting a more complete perspective of the sun's atmosphere. Understanding Earth's nearest star and its processes is of paramount importance, as the space weather created by the sun has a huge effect on the third rock from it and its inhabitants. The sun's gaseous outer atmosphere can create huge space storms. This violent space weather, in turn, can affect Earth's electrical grid, cell phone communications, satellite functioning, and the operation of astronauts in orbit.

"Such unique science is a tribute to the durability of the mission and the intellectual curiosity of our science team," said Ed Massey of JPL, who serves as Ulysses' NASA project manager.

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An Autumn Ghost– Oct 23, 2007 credit Norm Willey

If you are reading this online, you will be familiar with the web search error "404". Every time you hit a web page that no longer exists you will encounter this error message. Essentially that web page has become a ghost. But there is also an NGC 404 that is also very much a ghost. It is also known as the Ghost of Mirach, but unlike the web page error, you can actually see this ghost floating close to the star Mirach (pronounced "my-rak").

Some of you will already have seen the Ghost, in searching for oddities in the constellation Andromeda. But for most it sits in a part of the sky that is dominated by the overwhelming Andromeda Galaxy and its much more ethereal cousin M33. The only reason I stumbled across the Ghost was in using Mirach for a local area star to synch my EQ6 onto. As I was searching for interesting stars to capture their spectra (see an example of a spectrum of the star Caph, Figure 1), I not only centered Mirach in the eyepiece, but also spent a bit of time looking at it.

Figure 1

Mirach's interest from a spectral point of view is its classification as an M0 star. This means it is a smaller and less hot, with potentially interesting elements or even compounds in its outer shell. However, a glance in the eyepiece suggested it had slid into old age and was now in the Red Giant stage. A quick reference in Autostar confirmed a B-V rating of 1.58, meaning it was quite red. I was not hunting Red Giants, so I was about to pass it by when I noticed a faint smudge on its north side. Any time I can see a faint fuzzy from the light pollution capital of Vancouver Island (downtown Crofton), I know it must be significant!

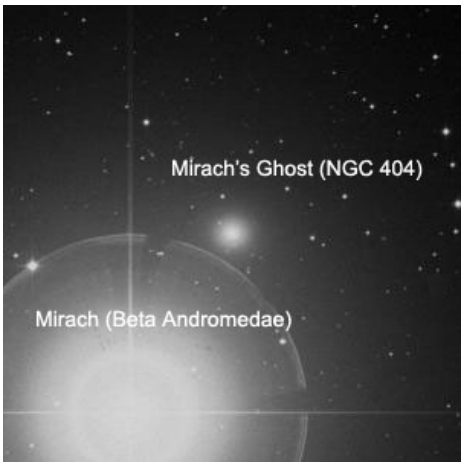

Figure 2

The Ghost is an elliptical galaxy, first seen by William Herschel in 1784. At magnitude 10.1 it would seem like a difficult find for Herschel or any present day amateur astronomer, but its location right next to Mirach makes it an easy catch. Mirach will be up in our sky from autumn through winter, so when you get a chance, have a peek at this Red Giant. The Ghost will be waiting for you. Unlike the web page error "404", NGC 404 is a nice autumn treat.

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Solar Telescope Reaches 120,000 Feet on Jumbo Jet-Sized Balloon– Oct 24, 2007 credit National Science Foundation

In a landmark test flight, the National Center for Atmospheric Research (NCAR) in Boulder, Colo., and a team of research partners this month successfully launched a solar telescope to an altitude of 120,000 feet, borne by a balloon larger than a Boeing 747 jumbo jet.

The test clears the way for long-duration polar balloon flights beginning in 2009 that will capture unprecedented details of the Sun's surface.

"This unique research project will enable us to view features of the Sun that we've

never seen before," said Michael Knölker, director of NCAR's High Altitude Observatory and a principal investigator on the project. "We hope to unlock important mysteries about the Sun's magnetic field structures, which at times can cause electromagnetic storms in our upper atmosphere and may have an impact on Earth's climate."

The project, known as Sunrise, is an international collaboration involving NCAR, NASA, the Max Planck Institute for Solar System Research in Germany, the Kiepenheuer Institute for Solar Physics in Germany, the Astrophysics Institute of the Canary Islands in Spain and the Swedish Space Corporation. Additional U.S. partners include the Lockheed Martin Corporation and the University of Chicago.

Funding for NCAR's work on the project comes from NASA and from the National Science Foundation (NSF), NCAR's primary sponsor.

"This successful balloon flight is an amazing engineering feat; it will pave the way for a more complete understanding of the solar magnetic field," said Cliff Jacobs of NSF's atmospheric sciences division.

The project may usher in a new generation of balloon-borne scientific missions that can be undertaken at far less cost than sending instruments into space. Scientists can test an instrument on a balloon before making a commitment to launch it on a rocket.
The balloon, with its gondola of scientific instruments, was launched successfully on the morning of October 3 from the National Scientific Ballooning Facility in Fort Sumner, New Mexico. It flew for about 10 hours, capturing stable images of the solar surface and a wealth of test data on the various elements of the sophisticated payload. The balloon then was collapsed and the gondola descended with a parachute, landing safely in a field outside Dalhart, Texas.
"We were able to verify the workings of the entire system end to end," said David Elmore, an NCAR engineer who oversaw the test flight. "We can now move on to planning the first full-scale mission with confidence."

The goal of the Sunrise project is to investigate the structure and dynamics of the Sun's magnetic fields. The fields fuel solar activity, including plasma storms that buffet Earth's outer atmosphere and affect sensitive telecommunications and power systems. The fields also cause variations in solar radiation, which may be a significant factor in long-term changes in Earth's climate. The Sunrise project is scheduled for a multiday flight over the Arctic in the summer of 2009, launching from Kiruna, Sweden. By taking advantage of the midnight Sun, the telescope will be able to capture continuous images for a period of several days to as long as two weeks, possibly orbiting the Arctic.
It may be launched later on another long-distance flight over the Arctic or the Antarctic.
At an altitude of 120,000 feet, the telescope will rise above most of the turbulence of the atmosphere. It will be able to view images in the ultraviolet range, which allow for higher resolution but cannot be obtained from Earth's surface.

The telescope will capture features on the solar surface as small as 30 kilometers across, more than double the resolution achieved by any other instrument to date. Scientists will be able to examine structures on the Sun that are key to understanding solar activity.
By observing the same area during an entire flight over high latitudes in summer, the telescope will enable scientists to continually witness changes in the magnetic fields without the interruption of night.

The Sunrise project has presented engineers with a number of extraordinary challenges. The balloon is designed to carry 6,000 pounds of equipment, including a 1-meter (39-inch) solar telescope, additional observing instruments, communications equipment, computers and disk drives, solar panels, and roll cages and crush pads to protect the payload on landing. The equipment must be able to withstand dramatic changes in temperature and the steel and aluminum gondola cannot vibrate in ways that could interfere with the

operations of the telescope. One of the most difficult aspects of the engineering work was to design the gondola in such a way that the telescope in flight would remain focused on a specific and relatively tiny area of the Sun, even while twisting on a soaring balloon for a week or longer during the full-scale research missions.

In addition to the telescope, the gondola on its full-scale research missions will carry a polarimetric spectrograph that will measure wavelengths in the Sun's electromagnetic spectrum and enable scientists to make inferences about its magnetic fields. Another instrument, known as an imaging magnetograph, will provide two-dimensional magnetic field maps.

Because the gondola is designed to withstand considerable force when it lands, the instruments can be launched on repeated missions. "This is a very economical way of rising above the atmosphere and capturing images that cannot be captured from Earth," Knölker said. "What we are doing is laying the groundwork for the next generation of space flights."

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Catch a Comet - No Telescope Required– Oct 30, 2007 credit NASA

Usually comets are challenging little no-see-um fuzzballs. To see one often requires a dark sky, a good chart or a telescope that can "go-to" the object automatically. This week there is a newly visible comet in the sky and it can be seen with the unaided eye! Last week, Periodic comet Holmes (17P/Holmes), a very faint comet far from the sun experienced an outburst and brightened a million times in just a few hours. The comet puffed up (it's still expanding), changed color and wowed viewers around the world.

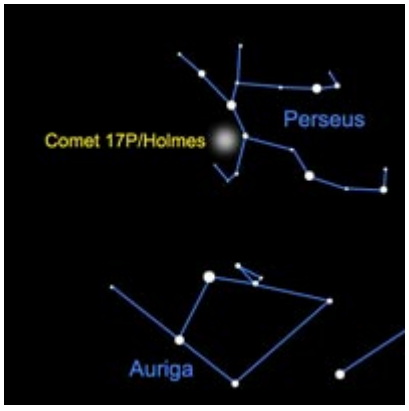

Image right: Sky chart showing location of comet Holmes in late October. Image

The Astronomy Photo of the day for October 30 (visit http://antwrp.gsfc.nasa.gov/apod/ap071030.html) shows the comet's current apparent size in the sky - compared to Jupiter, which you can also see in the west after sunset.

To see the comet, all you have to do is step outside and look to the Northeast. You should be able to see the "W" that is the constellation Cassiopeia - it's standing on its end. One and a half "fists" away to the right is a bright star in the constellation Perseus. You probably won't be able to see all the Perseus stars, but the bright one - Mirfak - should be visible. It marks the top of a triangle, which is about the size of your thumb held at arms length away. The triangle's lower left corner is the comet! Use our chart to the right to help find the comet.

The comet will stay with us for a while, so weather permitting, you'll get a look this week or next.

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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.

Observatory Free To a Good Home

The owners of Frank's home in the Properties have asked that we post Frank's old observatory in the buy and sell as "free to a good home" the only catch is you have to move it. For more information you can call Carrie at 748-8525.

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

Single 8" Meade Looking for an Astronomer

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

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Ask an Expert

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

Are you seeing double or unable to focus? Chances are you need to collimate your scope. Are you looking for a good eyepiece? Why do you need to know the focal length of your telescope's mirror and how do you determine the focal length? For answers to these and other telescope questions email Ed Maxfield our expert on telescope tips, hints and suggestions.

Are you new to astronomy? Want to know the how to find objects in the sky? Or just wondering what that bright object in the evening sky is? Well wonder no more; email Byron 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.

October Crossword Puzzle Answers–credit Kids Astronomy.com

Here are the answers to last month's astronomy crossword, hopefully you had some fun.

Comets, Meteors and Asteroids–credit meteorshowersonline.com

In the last few newsletters we've been talking about meteor showers, comets and asteroids. So what's the difference between Comets, Meteors and/or Asteroids? The Education Corner of Meteor Showers Online has a great explanation. Here's an excerpt:

Comets what are they?

Comets are primarily composed of ice and dust, causing some astronomers to refer to them as "dirty snowballs." They typically move through the solar system in orbits ranging from a few years to several hundred thousand years. Comets are not on fire. As they near the sun, the sun's heat melts the comet's ices and releases dust particles which are most evident as the comet's tail. Comets rarely come within a few million miles of Earth and, thus, have a slow apparent motion across our sky. Typical comets remain visible for periods of several weeks up to several months.

Meteors what are they?

Meteoroids are the smallest particles orbiting the sun, and most are no larger than grains of sand. From years of studying the evolution of meteor streams, astronomers have concluded that clouds of meteoroids orbiting the sun were produced by comets. Meteoroids can not be observed moving through space because of their small size. Over the years numerous man-made satellites recovered by manned spacecraft have shown pits in their metal skins which were caused by the impact of meteoroids. Meteoroids become visible to observers on Earth when they enter Earth's atmosphere. They are then referred to as meteors. They become visible as a result of friction caused by air molecules slamming against the surface of the high-velocity particle. The friction typically causes meteors to glow blue or white, although other colors have been reported. Most meteors completely burn up in the atmosphere at altitudes of between 60 and 80 miles. They are rarely seen for periods of more than a few seconds. Occasionally, a large meteor will not burn up completely as it moves through Earth's atmosphere. The subsequent pieces that fall to Earth's surface are known as meteorites.

Asteroids what are they?

Asteroids, or minor planets, have been described as "mountains in space." They are large rocks typically ranging from a few feet to several hundred miles across. The vast majority of asteroids move between the orbits of Mars and Jupiter in what is commonly called the "asteroid belt." They always appear star like and their motion with respect to the stars is usually so slow that several hours may pass before any movement is noticed. Most asteroids within the asteroid belt never come closer than 100 million miles from Earth, but there are some asteroids which come close to and even cross Earth's orbit. These objects can occasionally pass within a few million miles of Earth, and even within the orbit of the moon, and then exhibit a rapid motion that is discernable after only a few minutes. Asteroids within the asteroid belt can be observed every year, while the ones passing especially close to Earth may only be visible for a few weeks or months.

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RASC News

By Ed Maxfield

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The Sky This Month

By Bryon Thompson

Observing Site

Duncan, 48.783°N, 123.700°W

For those of you who missed the amazing exploding Comet 17P/Holmes visible in Perseus, there is still a chance in early November to get a look at this amazing sight. Scientists are still not sure why it increased its brightness other than to speculate that something caused the comet to suddenly out-gas or release a large number of particles from its nucleus. Reaching a naked eye magnitude of over 2.5 in late October the comet will continue to gradually dim as it performs a retrograde dance around the brighter stars in Perseus. Earth will chase the comet as our orbit draws us to our closest approach of 1.62 AU in early November. The comet will continue out to its eccentric orbit 5.02 AU from the sun. Its short 6.88 year period will bring it back to view in late 2014 but the bright appearance may not accompany it.

November is the month for the brightest of meteors as well. The Leonid meteor shower is expected to peak on the 18th of this Month. One of the reasons these meteors are so bright is that the relative motion of the cloud of dust they originate from and the motion of the Earth's orbit are opposite to each other. The Leonids are caused by the Earth and the dust from comet 55P/Tempel-Tuttle crashing headlong into each other. Our combined speeds result in these specs of dust hurtling through our upper atmosphere (155miles high) at speeds up to 71 km s-1. You may see 20 – 40 meteors per hour in the early morning hours of the 18th. The ionized glowing meteor trails can sometimes stay visible for up to five minutes. Every 33 years or so, the chances increase that we may see a real "shower" of thousands of meteors per hour. In 1966 and 1833 an incredible 100,000 meteors per hour were recorded. The most recent peak in the number of Leonids took place in 1999, so our chances of that kind of light show are slim but irregardless the show itself is worth watching.

All the naked eye planets are showing themselves this month to varying degrees. Jupiter is low in the South West chasing the sunset shining at magnitude -1.8. You should be able to see the four big moons but the giant planet is so low in the sky it will appear quite fuzzy. Near the end of the month it sets an hour after sunset.

Mars rises about four hours after sunset and can be found in Geminii. Over the next three months views of the Red Planet will get better and better. On November 15th Mars begins its retrograde motion (appears to go backward in its track across the sky) as Earth's orbit overtakes the orbit of Mars. You should be able to see subtle features on the surface of Mars such as the north polar cap, Syrtis Major, and Solis Lacus (the eye of Mars) depending on the seeing.

Saturn rises a little later and is placed in the constellation of Leo. By the end of the month Saturn reaches Quadrature (when the angle between the planet and the sun reaches 90 degrees). Look for the large gas giant's shadow on the rings at this time. You may catch a look at Titan, Saturn's largest moon as well.

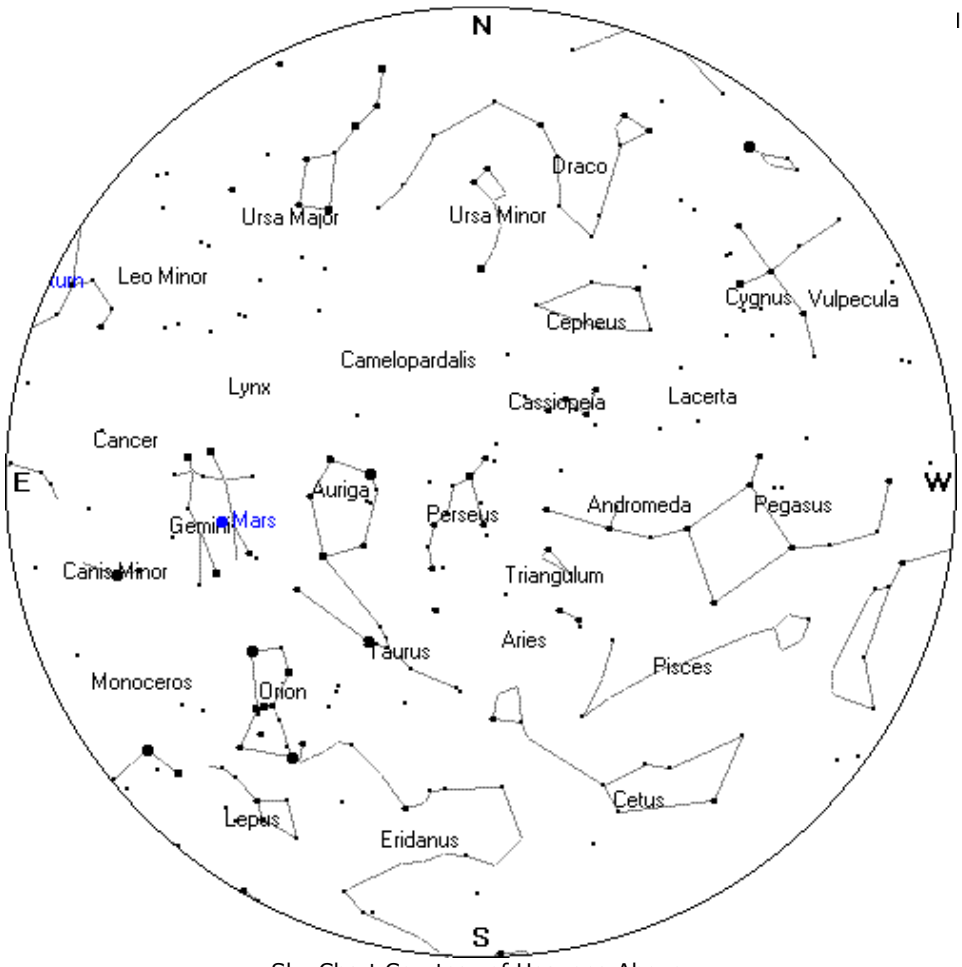
Venus is the early riser this month as it precedes the sun by four hours. Venus will be the brightest 'star' in the constellation of Virgo outshining the easy to find Spica by over 100 times. Remember the saying about the arc in the handle of the big dipper, "arc to Arcturus and speed on to Spica".

Just over an hour before the sun rises look to the east to see little Mercury glowing brightly as it climbs to its greatest elongation by November 8th. This show only lasts for a short time however as the inner planet sinks again towards the sun and is lost from view by the end of the month.

November 2007 (all times are in Pacific Daylight Time).

8th	4:00am PST	Mercury at greatest elongation
9th	3:03am PST	New Moon
17th	2:33pm PST	first quarter moon
18th	1:30am PST	Leonid Meteor shower peaks
23rd	4:13pm PST	Moon is at Perigee (approx. 222,000 miles from Earth

Sky Chart –Here's your mid-November 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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