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Greetings!

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

Did you know the club has been going since May 1988 that almost makes us 20 years old! And with every volunteer organization there are always challenges on how to keep new and old members engaged. The Societies Act stipulates that we need to fill (at a minimum) 5 director positions. To date we are short of directors. Please see the "Meeting Highlights" for more information.

Our December 4th meeting is all about enjoying the social side of our hobby. It is our annual dinner meeting at Good Company Steakhouse in Duncan.

With the cool winter nights upon us we are starting to get some great viewing opportunities. Now's the time to start hinting about those astronomy items that you just can't live without. Make sure you ask our resident expert on what's hot and what's not in our "Ask An Expert" category.

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

Have a safe holiday season.

Freda Eckstein

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

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Meeting Highlights

At the last meeting there was a lot of lively discussion around the Club's roles and responsibilities. As you are aware we have been without a Vice President since July and as of December we will be without a President. Thank goodness we still have our Secretary/Treasurer. Other significant roles such as Public Outreach Officer, Webmaster and Editor are also still being filled by current members.

I for one was uncertain as to what the Vice President and Presidents roles are. I have since received a copy of the Societies Act which states:

25 (1) The president, vice president, secretary, treasurer and one or more other persons are the directors of the society.

25 (2) The number of directors must be 5 or a greater number determined from time to time at a general meeting.

Part 7 — Duties of Officers

40 (1) The **president** presides at all meetings of the society and of the directors.

40 (2) The president is the chief executive officer of the society and must supervise the other officers in the execution of their duties.

41 The **vice president** must carry out the duties of the president during the president's absence.

42 **The secretary** must do the following:

- (a) conduct the correspondence of the society;
- (b) issue notices of meetings of the society and directors;

- (c) keep minutes of all meetings of the society and directors;
 - (d) have custody of all records and documents of the society except those required to be kept by the treasurer;
 - (e) have custody of the common seal of the society;
 - (f) maintain the register of members.
- 43 The **treasurer** must
- (a) keep the financial records, including books of account, necessary to comply with the Society Act, and
 - (b) render financial statements to the directors, members and others when required.
- 44 (1) The offices of secretary and treasurer may be held by one person who is to be known as the secretary treasurer.
- 44 (2) If a secretary treasurer holds office, the total number of directors must not be less than 5 or the greater number that may have been determined under bylaw 25 (2).
- 45 In the absence of the secretary from a meeting, the directors must appoint another person to act as secretary at the meeting.

Click on the link for a full copy of the Societies Act

http://www.qp.gov.bc.ca/statreg/stat/S/96433_01.htm

Ok, so now I'm more confused, the Society states we have to have 5 directors, President (vacant), Vice President (Vacant), Secretary/Treasurer (Trudy) and Public Outreach Officer (Bryon) we are still missing a position.

I'm not sure how/if Webmaster or Editor fit in the mix, however, they should be mentioned as they play a significant role in the club. Also there is a role of organizer for the annual Island Star Party which Norm Willey has offered to volunteer for and continue to head for the upcoming year.

In order to comply with the Societies act we need to fill all 5 director positions. Especially those of President and Vice President as soon as possible. The CVSF club has been going for over 19 years, I for one, would hate to see it be disbanded. If you are at all interested in these positions please bring your name forward, I will help to support you in any way I can.

Our next meeting at 7:30 on Tuesday December 4th. This is our annual dinner meeting held at the **Good Company Steakhouse** (270 Trans Canada Hwy) Duncan. Always a good time with a good crew, hope to see you there.

For more information about upcoming meetings go to [Starfinders Meetings](#)

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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 editor at: newsletter@starfinders.ca.



Providing rapid, responsive information and information services to members is at the heart of any club's mandate. We are currently looking into an interactive information exchange system (listserve) allowing a members discussion to take place among a group. Any message you send to the list will be distributed to every other member of the list. You don't have to actively participate by sending messages; you can just view the discussions, or "lurk", as it is known on electronic networks. This software would prove to be very effective especially to instigate impromptu observing sessions. Stay tuned.

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Web News

What will it be like to do ordinary things on the extraordinary alien worlds of our solar system? In 1971, during the Apollo 14 mission, astronaut Alan Shepard hit a few golf balls on Earth's moon, where the gravity is six times weaker than on Earth. Now you can try, GOLF SECTOR 6 is an easy-to-play, Flash-based golf game that lets you tee off on Saturn's moons. It is based on some of our most stunning images returned from the high resolution cameras onboard the Cassini spacecraft that have been processed by CICLOPS and released to the public here on this website check it out at: <http://ciclops.org/sector6/golf.php?js=1>

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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"

Here's a cool pic of Comet 17P/Holmes that Norm Willey took from his observatory in subaquatic Crofton.



WOW Moon Probe Captures "Earth Rise" in High Definition

The Kaguya spacecraft, also called Selene, has been orbiting 62 miles (100 kilometers) above the moon since Oct. 18. The new [Earth-rise image](#) shows our blue world floating in the blackness of space. Released today, it is a still shot taken from video made by the craft's high-definition television (HDTV) for space.

A second image, taken from a [different location](#) in the lunar orbit, has been dubbed Earth-set. A related series of still images shows our planet setting beyond the lunar horizon. In the [Earth-set image](#), Earth appears upside-down; visible are Australia and Asia. A region near the moon's south pole is seen in the foreground. The footage was taken Nov. 7 using equipment provided by the Japan Broadcasting Corporation (NHK).

SPACE STATION: On Nov 16, the International Space Station (ISS) passed over the Netherlands where astrophotographer Ralf Vandebergh was waiting with his camera and a 10-inch telescope. He took these pictures:



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Articles

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China Sends Chang'e-1 to the Moon – Oct 24/07 credit Provided by the ESA

The Chinese National Space Administration (CNSA) launched a bold new mission to the Moon today. Chang'e-1 blasted off from the Xichang Satellite Launch Centre, Sichuan, atop a Long March 3A rocket. Chang'e-1 represents the first step in the Chinese ambition to land robotic explorers on the Moon before 2020.

Chang'e-1 has four mission goals to accomplish. The first is to make three-dimensional images of many lunar landforms and outline maps of major lunar geological structures. This mapping will include the first detailed images taken of some regions near the lunar poles. Chang'e-1 is also designed to analyze the abundance of up to 14 chemical elements and their distribution across the lunar surface. Thirdly it will measure the depth of the lunar soil and lastly it will explore the space weather between the Earth and the Moon.

The spacecraft is large, weighing in at 2350 kg and it will operate from a low, circular lunar orbit, just 200 km above the surface of the Moon. From here, it will perform its science mission for a full year.

ESA is collaborating with the Chinese on this mission by providing spacecraft and ground operations support services to CNSA. The two agencies will also share data and encourage a visitors' programme so that researchers can learn from each other. During ESA's SMART-1 mission, the Agency provided the Chinese with details of the spacecraft's position and transmission frequencies, so that the Chinese could test their tracking stations and ground operations by following it. This was part of their preparation for Chang'e-1. Now it is time for Chang'e-1 itself to fly.

Hermann Opgenoorth, Head of ESA's Solar System Missions Division says, "Participation in Chang'e-1 gives European scientists and ESA experts a welcome opportunity to maintain and pass on their expertise and to continue their scientific work. Based on the experience gained with this first mission, we intended to cooperate on the next missions in China's Chang'e line of lunar explorers." To perform its science mission, Chang'e-1 carries a variety of instruments: a CCD stereo camera, a laser altimeter, an imaging interferometer, a

gamma-ray/X-ray spectrometer, a microwave radiometer, a high-energy particle detector, and a solar wind particle detector.

Named after the Chinese goddess of the Moon, Chang'e-1 represents the first phase in the Chinese Lunar Exploration Program (CLEP). This program is expected to last until around 2020 and the next phase will include a lander and associated rover. Looking farther into the future, plans are being drawn up for a sample return mission to bring lunar rocks to Earth for analysis.

"ESA's expertise in tracking Chang'e-1 sets the stage for future cooperation with China. The Agency's tracking station network, ESTRACK, is a resource that benefits not only the Agency but also all space science through such international cooperation," said Erik Soerensen, Head of the System Requirements and Validation Section at ESA's European Space Operations Centre.

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Space Rocks Go Under the Hammer – Oct 28, 2007 credit BBC News

Some of the world's most famous meteorites have gone under the hammer at a New York auction house in what is said to be the first sale of its kind. The pieces were drawn from collections across the world and many examples are richly coloured and intricately patterned, some bearing gemstones.

This piece of a meteorite found in the Gobi Desert near Fukang, China, is a pallasite, studded with space gems. A piece priced at \$1.1m (£0.53m) did not sell but an iron meteorite from Siberia fetched \$123,000 (£60,000).



And a US mailbox hit by a meteorite in 1984 sold for \$83,000 (£40,000).

"The results were stronger than anticipated with a near-perfect result," Bonhams meteorite specialist Claudia Florian said after the sale.

Bonhams, she added, hoped to sell the unsold lots "in the next several days".

Some of the 54 lots of "fine meteorites" for sale at Bonhams fell to Earth thousands of years ago. Only one is documented as having made a fatal impact.

The fatality, in the case of the Valera Meteorite which hit a field in Venezuela in 1972, was a cow. "It's very rare to have a meteorite actually impact a living being... so now that particular meteorite is considered to be collectible," Ms Florian told the BBC before the sale. It was sold for \$1,300.

A sliver of the meteorite which damaged Carutha Barnard's private mailbox in Claxton, Georgia, in 1984 sold for nearly \$8,000 (£3,900).

Some of the lots originated in the UK's Natural History Museum or the US Smithsonian Institution but many come from the Macovich collection in New York, built up by enthusiasts whose interest in the stones was as much aesthetic as scientific. With a price estimate of \$1.1m, the piece de resistance for Sunday's sale appeared to be the "Crown Section" of America's famous Willamette Meteorite, discovered in Oregon in 1902. The 13kg (29-pound) piece was cut from the rock as part of a meteorite exchange between the museum and collectors.

But that still leaves the American Museum of Natural History with about 15.5 tonnes (32,000 pounds) of the original. In the event, the Crown Section did not sell, nor did the Brenham meteorite found in 2005 near Greensburg, Kansas, which had an estimate price of up to \$700,000. The Brenham features naturally occurring olivine gemstones.

Another non-seller was an historic piece from the l'Aigle Shower of 1803 in

Normandy, France - a find which helped convince European scientists that rocks **6** could, indeed, fall out of the sky.

An altogether more humble offering was four tiny stones - the smallest of them weighs just a gram - from a shower which hit Holbrook, Arizona, in 1912. That lot sold for \$325.

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Black Hole Bonanza – Oct 29, 2007 credit Discovery News

A study of ancient galaxies led astronomers to a goldmine of black holes, a discovery that more than doubles the number found in the early universe.

"We had seen the tip of the iceberg. Now, we can see the iceberg itself," says Dr Mark Dickinson, with the US National Optical Astronomy Observatory in Tucson, Arizona. Astronomers discovered that active, supermassive black holes were ubiquitous in the early universe, though they are difficult to observe.

Black holes are objects so dense that not even light can escape the grasp of their massive gravitational fists. They are detected by studying their effects on nearby objects and matter. Scientists using a pair of complementary space telescopes, one sensitive to x-ray radiation and the other probing infrared wavelengths, discovered the black holes hiding deep inside envelopes of dust and gas that pocket ancient galaxies. The telltale sign was an unusually large amount of infrared radiation due to the black holes' heating of surrounding dust. The doughnut-shaped structures that comprise the ancient black holes and dust clouds, called quasars, typically emit x-rays as the black hole cores devour their dusty rings. The infrared radiation was a clue that something else was going on.

Scientists were initially studying 1000 galaxies formed when the universe was between 2.5 and 4.5 billion years old. The galaxies were believed to be without the black hole-laced quasars. Observations with the Spitzer infrared telescope, however, revealed about 200 of the galaxies were radiating an unusual amount of infrared light. When combined with x-ray images from the Chandra observatory, astronomers found that the galaxies were hiding quasars inside. Previously only a handful of the most energetic quasars were found in ancient structures.

"We found most of the population of hidden quasars in the early universe," says Dr Emanuele Daddi of France's Atomic Energy Commission in France, who led the team of researchers. The scientists estimate the number of black holes found to be in the hundreds of millions. The findings, which will be published in the 10 November issue of the *Astrophysical Journal*, are helping astronomers understand how the first galaxies in the universe formed. The researchers think stars and black holes built up simultaneously until the black holes got so big they suppressed star formation.

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Cosmic Illusion: Mars to Move Backward – Nov 9, 2007 credit Space.com

We're now coming into the home stretch of the last good apparition of Mars until 2016. Now blazing in the late-evening east-northeast sky like an eye-catching yellowish-orange "star," Mars is less than six weeks away from its closest approach to Earth during this apparition.

At the beginning of the year, the red planet was 221 million miles (356 million kilometers) from Earth. This week, it will be 63 million miles (102 million kilometers) away and it now shines some 10 times brighter than it did on New Year's Day. Since Jan. 1, Mars has progressed more than halfway around our sky and now is on an easterly course through the background stars of the Zodiac. It currently resides smack in the middle of the constellation of Gemini, the Twins. But on Thursday, Nov. 15, that steady eastward course is going to come to a stop.

Wandering 'star'

Actually, for the past few weeks, Mars has appeared to slow in its eastward

trajectory as seen from Earth. It seems to waver, as if it had become uncertain. Finally, on Nov. 15, it will pause and come to a halt. Then, for about the next 11 weeks, the "wandering star," as ancients called it, will reverse its course in the heavens and move backward against the star background – toward the West. Then, on Jan. 30, 2008, it will pause again, before resuming its normal eastward direction.

All the planets exhibit this "retrograde motion" at one time or another. But for the longest time, the ancient astronomers were unable to come up with a satisfactory explanation for it. For one thing, while behaving in this strange manner, Mars will also appear to deviate somewhat from its normal course; the retrograde motion will appear to bring it a little above its regular orbital track. In other words, for those of us watching from Earth, Mars will appear to travel in a loop.

Yet, the Greeks staunchly believed that the sun, moon and planets all moved around the Earth in perfect circles. They had a great difficulty in representing and calculating this mysterious loop and for a long time they had no adequate explanation for it. The Greeks finally explained away this anomaly by assuming that the planets moved around the Earth in smaller "epicycles" – that is, a small circle whose center moves along its main orbital circle around Earth, resulting in complex, almost coil-like curves. Unfortunately, the actual observations of the planets never seemed to fit this strange orbital mechanism, ultimately making the Greeks explanation quite useless.

The truth emerges

It was not until the year 1543 when the great Polish astronomer Nicolaus Copernicus (1473-1543) had his lifelong work "De revolutionibus" published, that the secret of the odd retrograde loops were finally revealed. By demoting the Earth from its hallowed position at the center of the solar system and replacing it with the Sun, he was able to triumphantly explain the riddle of the apparent "backwards motion effect" of the planets.

In fact, it's the same effect obtained when passing another car on a highway: Both cars are going in the same direction, but one is moving more slowly. As they pass, the slower car will appear to be moving backward in relation to the faster one. Copernicus simply applied the same effect to the planets. In the present situation, both Earth and Mars are moving in the same direction around the Sun, but the slower one, Mars, appears to move backwards compared to the faster one, Earth.

Just an illusion

The retrograde motion of Mars – like the apparent motion of the slower car on the highway – is nothing more than an illusion. The last two times Mars underwent retrograde motion (in 2003 and 2005), I received numerous inquiries asking if the sun, as seen from Mars, would also appear to stop and move backwards across the sky. The answer is most definitely "no."

The apparent backward motion will manifest itself after Mars arrives at its first stationary point on Nov. 15. Mars will then begin to loop back toward the west. Earth will overtake Mars on Christmas Eve. Finally, on Jan. 30, 2008, the combined movements of Earth and Mars will cancel-out the apparent backward motion, with Mars reaching a second stationary point. From then on, Mars will loop back to the east, resuming its normal eastward path among the stars.

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Sun's Twin Discovered – Nov 12, 2007 credit Astronomy.com

Peruvian astronomers Jorge Melendez of the Australian National University and Ivan Ramirez of the University of Texas at Austin have discovered the best "solar twin" to date, using the 2.7-meter Harlan J. Smith Telescope at the McDonald Observatory. Their findings suggest that the Sun's chemical composition is not unique, as some previously thought.

The star, HIP 56948, is more like the Sun than any yet seen, and is 200 light-years

away in the constellation Draco, the dragon. The star may be a billion years older **8** than the Sun.

Only three solar twins were previously known: 18 Scorpii, HD 98618, and HIP 100963. But while they were all like the Sun in many ways, there was one major difference: the amount of lithium they contained. They all had several times more than the Sun. Astronomers wondered if the Sun was unique in its low amount of lithium.



This image is a finder chart for HIP 56948. The star is located 200 light-years away in Draco, the dragon. It's too dim to see with the unaided eye.

The discovery of this new solar twin puts that question to rest: it has the same low lithium content as the Sun. The study turned up another solar twin, HIP 73815, that contains a similarly low amount of lithium.

The question of chemical peculiarities in the Sun is related to the "anthropic principle" — is there something special about the Sun

that has allowed life to spring up in our solar system? Their findings don't answer that completely, but they do show that when it comes to the Sun's chemical composition, the answer is an emphatic "no."

Melendez and Ramirez's findings suggest the opposite, so-called "Copernican" view: It is possible that life is common elsewhere in the universe. They suggest that stars like HIP 56948 would be good targets for SETI (Search for Extra-Terrestrial Intelligence) researchers.

The star has already been studied by the McDonald Observatory Planet Search, led by University of Texas at Austin astronomer Bill Cochran. His team found that, like our Sun, HIP 56948 does not host any "hot Jupiter" planets, those massive, short-period planets orbiting close to their parent stars, so common among the more than 200 stars found to date that host one or more planets.

Searches for "solar twins" are important because astronomers use the Sun as a baseline for many other types of studies. But they cannot study the Sun the same way they do the distant stars. It's too close, and too bright.

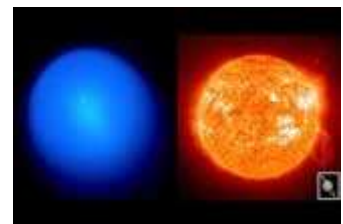
The solar twins discovered at McDonald will be useful for many areas of astrophysics. In particular, they will help astronomers who study the chemical compositions of stars, as well as validate theoretical models of stars' interiors, and theoretical models of stellar evolution.

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Incredible Comet Bigger Than the Sun – Nov 15, 2007 credit Space.com

A comet that has delighted backyard astronomers in recent weeks after an unexpected eruption has now grown larger than the sun.

The sun remains by far the most massive object in the solar system, with an extended influence of particles that reaches all the planets. But the comparatively tiny Comet Holmes has released so much gas and dust that its extended atmosphere, or coma, is larger than the diameter of the sun. The comparison is clear in a new image.



"It continues to expand and is now the largest single object in the solar system," according to astronomers at the University of Hawaii. The coma's diameter on Nov. 9 was 869,900 miles (1.4 million kilometers), based on measurements by Rachel Stevenson, Jan Kleyna and Pedro Lacerda of the University of Hawaii Institute for Astronomy. They used observations from the Canada-France-Hawaii Telescope. The sun's diameter, stated differently by various sources and usually rounded to the nearest 100, is about 864,900 miles (1.392 million kilometers).

Separately, a new Hubble Space Telescope photo of the comet reveals an intriguing bow-tie structure around its nucleus. The comet's coma—mostly microscopic particles—shines by reflecting sunlight.

See for yourself

Holmes is still visible to the naked eye as a fuzzy star anytime after dark, high in the northeast sky. It is faintly visible from cities, and from dark country locations is truly remarkable. "Right now, in a dark sky it appears as a very noticeable circular cloud," said Joe Rao, SPACE.com's Skywatching Columnist. Rao advises looking for the comet this weekend, before the moon becomes more of a factor. The comet will likely diminish in brightness yet remain visible for the next two to three weeks, he said. "Over the next few weeks and months, the coma and tail are expected to expand even more while the comet will fade as the dust disperses," Stevenson and her colleagues write.

On Monday, Nov. 19, the comet will create a unique skywatching event with its see-through coma, according to the Web site Spaceweather.com: "The comet will glide by the star Mirfak [also called Alpha Persei] and appear to swallow it—a sight not to be missed." A small telescope will reveal the fuzzy coma. Lacking a long tail characteristic of some great comets, however, Holmes is not the most dramatic object in the sky for casual observers.

Mystery outburst

Nobody knows why Holmes erupted, but it underwent a similar explosive brightening in 1892. The recent display, which began Oct. 24, brought the comet from visual obscurity to being one of the brighter objects in the night sky. It has since dimmed somewhat as the material races outward from the nucleus at roughly 1,100 mph (0.5 km/sec).

The Hawaiian astronomy team writes in a press statement: "This amazing eruption of the comet is produced by dust ejected from a tiny solid nucleus made of ice and rock, only 3.6 kilometers (roughly 2.2 miles) in diameter." The new image from the Hawaiian observatory also shows a modest tail forming to one side, now just a fuzzy region to the lower-right. That's caused by the pressure of sunlight pushing on the gas and dust of the coma. But the comet is so far away—149 million miles (240 million kilometers), or about 1.6 times the distance from Earth to the sun—that even Hubble can't resolve its nucleus.

The offset nature of the coma, seen in ground-based images, suggests "a large fragment broke off and subsequently disintegrated into tiny dust particles after moving away from the main nucleus," Hubble astronomers said in a statement today. The comet's distance, plus all the dust, prevent Hubble from seeing any fragments.

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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.

Way-Out Quiz—credit hubblesite.org

Test your Cosmic Trivia to see if you are a novice, pretty smart about space or a Astro-brainiac and help one cow plot a path out of the Milky Way. Visit http://hubblesite.org/explore_astronomy/way_out/

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RASC News

By Ed Maxfield

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The Sky This Month

Observing Site

Duncan, 48.783°N, 123.700°W

Winter Solstice, the longest night of the year in the northern hemisphere, occurs on December 22nd. It was on this night that the tradition of burning the Yule log began. Odin the Norse God was also called Yule Father (Yule referred to the sun). Burning the log was like keeping a piece of the sun to ward off bad spirits on the longest night and to herald the returning sun. A festival that included food, music and games ensued. A piece of the wood was saved and kept all year to start the next season's Yule log fire. When the Normans invaded England in 1066 the tradition passed on to the Anglo Saxons and was continued through the centuries. As cast iron slowly replaced stone fireplaces the tradition became less observed. Today's version is in reference to food rather than keeping a piece of the sun going for the New Year. There may be a few astronomers however, burning the midnight oil up in order to stay up late and see some of this month's sights.

It is worthwhile noting the size of Comet 17P/Holmes as it has grown to be the largest thing in the Solar System, dwarfing even our own Sun! If you haven't gotten a look at it yet get out there on the next clear night and have a gander at this amazing object. It is best to use a pair of binoculars and look into the bottom part of Perseus. Your bound to gasp aloud, so be sure to share the experience with a friend.

Another comet of telescopic or binocular interest is 8P/Tuttle. Tuttle will go from 9th magnitude to 5th or 6th magnitude by the end of December. It can be found passing through Cassiopeia, Andromeda and Triangulum. A nice view can be seen on the night of December 30th as it passes within a degree of galaxy M33.

One of the year's best meteor showers is resident in December. The Geminid meteors will put on a good show between December 7th and the 17th with the peak night on the 14th. Their bright trails are a welcome sight in a cold dark night sky and can be seen best when the constellation Gemini reaches its peak height near the zenith (overhead) around midnight. You may see as many as 100 per hour if you are in a dark site and your prepared with some hot beverage, a blanket and a comfortable chair. A bright red Christmas star joins them in the same constellation.

"Mars with your nose so bright, won't you guide my sleigh tonight!" It doesn't have the same ring to it somehow, but Mars is the Planet to watch in this month as our Red Sister plays at being Rudolph when it reaches its peak brightness of magnitude -1.6 at opposition (opposite the sun with us in the middle) on Christmas Eve. It may not be leading Santa's sleigh but I'm sure it will rival the little reindeer's nose! It won't be as bright as it was back in 2005. Its opposition back then took place when Mars was actually closer to us than it is now. However it will not appear as bright again until 2016. On a different note of minor indulgence, Mars will also be the candle on my birthday cake as it arrives on its actual closest approach to Earth on the night of December 18th at 54.8 million miles. ;) For telescope viewers who are lucky enough to have a clear sky and good 'seeing', look for Syrtis Major to be the dark feature on Mars during its opposition. Mars is also halfway through its retrograde motion and repeated views will show its westward wandering through Gemini.

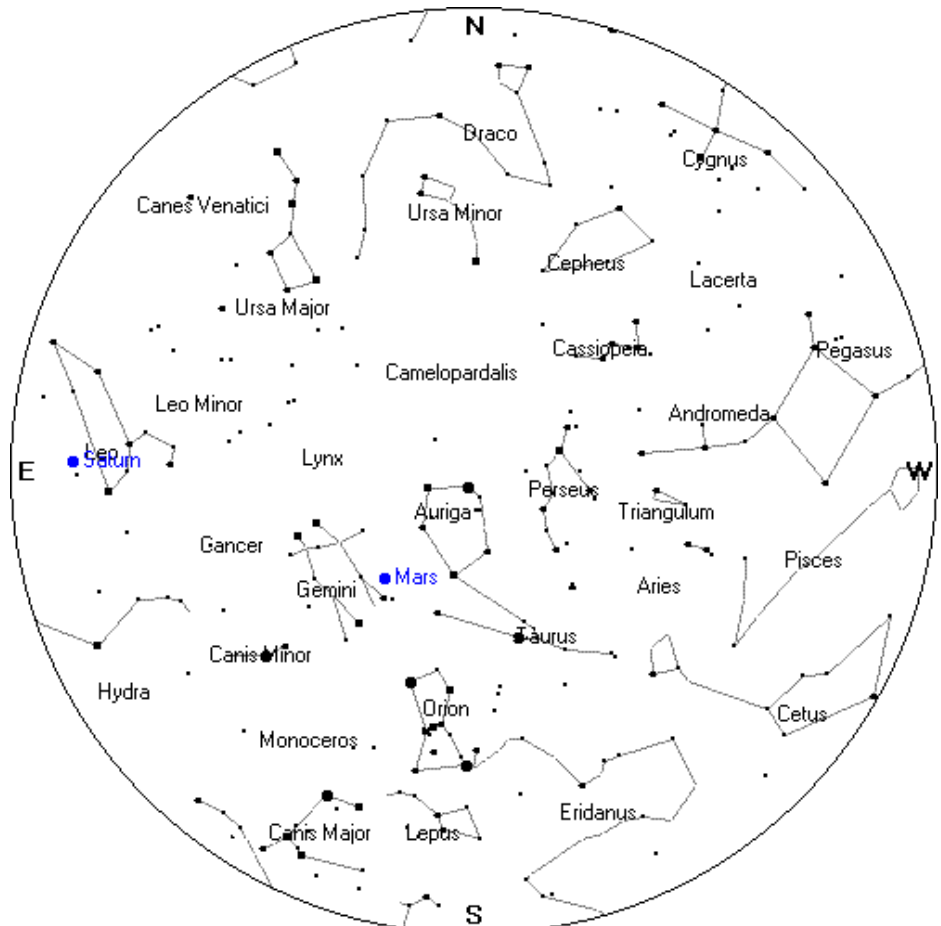
Jupiter is hidden from most viewers in our area as it chases the sunset and is lost in the twilight. Neptune, our furthest true planet is visible to binocular viewers in the constellation Capricornus the Sea Goat. It sits about 2 degrees from the star Iota Capricorni. The nearer Uranus is also found in the early evening sky in the south just east of 81 and 82 Aquarii. You will need your binoculars to spot this 6th magnitude blue gas giant. At the same time as Mars' big Christmas light show on December 24th, Saturn can be found about 25 degrees above the eastern horizon. If you have a hard time measuring degrees in the sky, this is roughly equal to the length of the big dipper. Try for a look at the nearly edge on rings as

the big planet's shadow blocks out the western half of them. The big moon Titan **12** can be found near the planet but the harder to see Iapetus at magnitude 10.1 is a little further out to the west of Saturn. Iapetus is an anomaly in that its leading side is covered by some dark material composed of matter that was either swept up from space or oozed from the moon's interior, scientists are still unsure. Its other side is very bright and it is this side that faces us this month.

You may want to get up a little earlier, around 4am, to see both Venus and the crescent moon share the morning sky with Spica, Virgo's brightest star on December 5th. Venus will move closer to the horizon as the month nears its end. Happy Holidays to everyone and best wishes for a clear New Year.

December 01	05:00am PST	Moon is 20 south of Saturn
December 05	04:00am PST	Moon is 70 south of Venus
December 09	09:40pm PST	New Moon
December 14	12:30pm PST	Geminid Meteor shower peaks
December 18	04:00pm PST	Mars closest to Earth (54.8 Million Miles)
December 22	10:00pm PST	Winter Solstice
December 23	05:16pm PST	Full Moon
December 24	12:00pm PST	Mars at Opposition
December 30	12:00pm PST	Comet 8P/Tuttle passes by M33

Sky Chart –Here's your mid-December 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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