

President: president@starfinders.ca

Web: www.starfinders.ca

Editor: newsletter@starfinders.ca

Categories

1. [GREETINGS](#)
2. [SOCIAL HIGHLIGHTS](#)
3. [UPCOMING EVENTS](#)
4. [THIS MONTH IN HISTORY](#)
5. [COOL PICS/VIDEOS](#)
6. [FEATURED ARTICLES](#)
7. [BUY AND SELL](#)
8. [ASK AN EXPERT](#)
9. [FAMILY KORNER](#)
10. [THE SKY THIS MONTH](#)

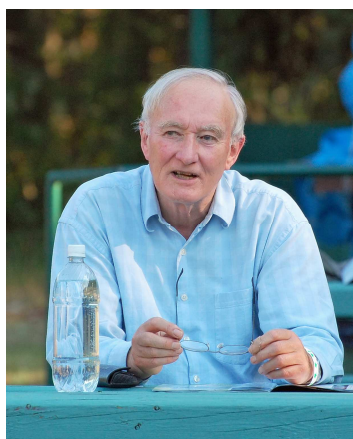
Greetings!

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

It's a funny thing this whole new years business, the grand whoop la of Christmas is over, everyone's settling back into work and then comes January. It almost seems like after the party it's clean up time. Time to "straighten up and fly right" for the folks who are struggling to keep their resolutions. I myself don't make resolutions, I figure if I couldn't get it together all last year, then it couldn't have been that important.

Our tradition instead is to remember our family, friends, accomplishments and all the good times from the year before. We then close out the year with our annual penny toss. It's really all about being thankful for what we have right now, today, and what we have already been given. The universe may be infinite but we humans are finite. "Life is happening while we're busy making plans." I know we can't fully live in the finite but I think this world would be a much better place if we tried to do it more often instead of thinking that we have all the time in the world to tell our friends or loved ones how special they are, to laugh or to REALLY thank the grocery clerk for all his/her help.

On January 1st we lost a friend and valued member. Robert Deane had such a great mind and he often brought smiles to our faces when he would speak about inconsistencies in theories and/or events that were presented. He did so in such a humorous way as to ensure not to intimidate or embarrass the presenter. He was



very happy when the socials moved to Mill Bay and was one of our regular attendees. He always had some encouraging words for me and always thanked Bryon and I for hosting the evening on his way out. As much as I knew Robert as an avid astronomer, there were a great many things that I did not know. At Robert's memorial, his son Andrew presented a heartwarming eulogy and shared some wonderful memories of his father. Our thoughts go out to Robert's family at this difficult time.

This newsletter is dedicated to the life of Robert Deane. A very modest man who I'm sure would be uncomfortable with the attention. But I'm most certain he is having a wonderful humorous debate with the good lord himself on the inconsistencies in the universe.

My gratitude goes out to this month's contributors, Moe Raven and Bryon Thompson. I could never accomplish this newsletter without your help.

Freda Eckstein

"I wish you much love, tons of giggles and dancing around the floor!" ~Judy Julius-Horsfall

[back](#)

Quick Links

[ABOUT THE CLUB](#)

[NEWSLETTER ARCHIVES](#)

[MONTHLY SOCIALS](#)

[BECOME A MEMBER](#)

[NEWSLETTER SUBMISSIONS AND SUGGESTIONS](#)

Socials

Socials are held on the **4th Wednesday of each month** at the home of Bryon and Freda. See the website for a map or follow these directions.
Island Hwy, Mill Bay

Turn on Frayne Rd towards ocean (Serious Coffee is on the corner)

Turn right on Huckleberry Rd

3rd house on the left across from Springbank road and Mail boxes.

Look for the STAR sign

Please park on Huckleberry or Springbank Rd's.

Call Brian 743-6633 if you need directions

Our next Social will be held at **7:30 on WEDNESDAY January 27th** our presentation is TBA.

[back](#)

Highlights - Dec 16/09

By your friendly neighborhood Editors

Our winter dinner social started off very confusing (time wise) it seems wired got crossed and members were showing up for dinner from 5:30 to 7:00. But no one seemed to mind and everyone was in great spirits. All the names with the right answer to the November contest were put into a hat and the winner was drawn. The question was "What do Pink Floyd, Hemmingway and Elvis have in common?" The answer is they are all near earth November asteroids below 2 AU. The lucky winner is Doug Dulmage. Congratulations Doug, you can pick up your prize at the next social. So of course there was lots of kibitzing going on and much to talk about. Bryon and I learned about some great free software on the web that helps protect your computer against viruses, spyware and malware. If you are a pc user then Microsoft Security Essentials is for you plus Trend Micro Housecall is a good app for Malware, Spyware etc. Best of all did I say it was FREE.

[back](#)

Upcoming Events

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

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

January 18th C-FAX MOVIE SCREENING: "CREATION"

Odeon Theatre (Yates St) 7:00pm

Plot: English naturalist Charles Darwin struggles to find a balance between his revolutionary theories on evolution and the relationship with religious wife, whose faith contradicts his work.

NASA Launches (provided by NASA.Com):

None this month

[back](#)

This Month In History

Courtesy of: Nick Greene, About.com

[back](#)

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".

While surfin' I found two great links to get you ready for "Your Year in Astronomy". Both links are

courtesy of the Oneminuteastronomer.

A great way to help you find your way around the sky is a program called Stellarium. It is essentially a 'personal planetarium' for your computer. Just set your location and time of day, and it gives you a wonderfully realistic view of the sky. It shows the stars, planets, and constellations visible from your location, or from anywhere on Earth. It gives you detailed information on thousands of stars, galaxies, star clusters, and nebulae. You can [view some screen shots from Stellarium here](#). Stellarium is fun to play with and it's easy to use. And best of all... it doesn't cost you a dime. You can download it at the Stellarium website at www.stellarium.org. It works on Mac or PC.

Here's a wonderful 20 minute interview with astrophotographer Jerry Lodriguss a world-renowned astrophotographer and a former professional sport photographer who was 3 times nominated for a Pulitzer Prize. His astrophotos have been published in *Sky and Telescope* and NASA's Astronomy Picture of the Day, and he's published three books about astrophotography including *The Beginner's Guide to DSLR Astrophotography*. [Click here to play the interview](#) (or right-click and select "Save Link As" to save the audio file to your computer to play at your convenience

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

[back](#)

Featured Articles

Articles

[RETURN TO CATEGORIES](#)

1. [Nanaimo Couple Mystified by 4 Mysterious Lights](#)
2. [Spirit Faces Uncertain Future](#)
3. [Beyond the DaVinci code](#)
4. [Now is Your Chance to Own a Piece of History](#)
5. [Dark Matter Beach Ball Unveiled](#)
6. [2010: The Year of the Baffling Eclipse](#)

Nanaimo couple mystified by four mysterious lights over Mount Benson– December 30/09 credit CHEK News

Nanaimo's Chris Ansell and Kathleen Kirby have crossed Santa Claus off their list as they search for answers after they reported seeing four unidentified flying objects over Mount Benson on Christmas Day.



At 8:29 p.m., while on the deck of Ansell's parents' home on King John Way, the couple saw four orange lights the size of stars zip through the sky from four different directions and come together above the mountain. Ansell, 35, whipped out his Blackberry to catch the action, while Kirby, 23, grabbed a nearby camera.

A copy of the photo taken by Kathleen Kirby and boyfriend Chris Ansell of what they saw flying over Mount Benson on Christmas Day.

The four "starlike lights did this weird zig-zag thing and then turned into green glowing spheres and then, poof, they disappeared upwards," Ansell said, gesturing frantically with his hands. In less than 40 seconds it was all over, but Ansell and Kathleen captured three images they hope will eventually lead to an explanation of their mysterious sighting. "We know it wasn't Santa. He had already come and gone," said Ansell with a laugh, pointing to his mother.

Paul Greenhalgh, president of the Fraser Valley Astronomers Society, has a few suspicions about what could have caused the extraordinary light show, though he discounts the possibility they were UFOs. After examining Ansell's and Kirby's photos, Greenhalgh believes the "stars" are part of the Big Dipper constellation.

The low horizon of the Earth and thicker density of the atmosphere from the angle the stars were seen caused them to change colour from orange to red to blue and green. Greenhalgh also said the satellite Chandra (an X-ray space observatory) was also moving across the sky at the same time as the couple's sighting, as were two iridium satellites. "If they flared, otherwise known as an iridium flare, this could also add to the equation," added Greenhalgh. As far as the

description of the erratic movements, Greenhalgh has no explanation. "I have a philosophy about UFO sightings," he said. "The galaxy is 100,000 light years across. If we were able to send a message from our solar system to another solar system on the other side of the galaxy through the galactic core, without it being disrupted with all the radiation there, it would take 65,000 years for us to say hello and an additional 65,000 years for them to reply. It's going to be a very boring conversation." Greenhalgh has studied and stared into the sky for more than four decades without ever seeing an UFO. Only once in 43 years did he see a flying object he couldn't explain. But he uncovered the mystery two years later when he discovered the v-shape formation and central bright light he saw had been U.S. Navy satellites that had been tethered together. Greenhalgh also point out that any aircraft that enters the Earth's atmosphere would definitely be detected by the North American Aerospace Defense Command. "NORAD can track anything from the size of a ping pong ball and larger," he said.

Ansell and Kirby continue to keep a close eye on the night sky above Mount Benson with the hopes of another sighting. "I just need an explanation. I don't believe in extraterrestrials or anything like that, but anything is possible," said Ansell. "We do live in a huge universe and there could be things out there that just want to observe us. "All we can hope is someone else saw it, too."

An addendum to this story is a CHEK TV interview with one of our members Doug Dulmage. Doug solves the mystery of the strange Christmas lights. That was some good investigative work Doug, we're proud of you, but it doesn't seem to address the zigzag motions identified. Oooo wooooo oooo ☺ maybe it was "little green men" posing as satellites..Just kidding Doug. To see the interview click [CHEK TV interview](#)

[back](#)

Spirit Faces Uncertain Future as New Year Dawns – December 31/09 credit Science@NASA

December 31, 2009, NASA's Mars rover Spirit will mark six years of unprecedented exploration of the Red Planet. However, the upcoming Martian winter could end the roving career of the beloved, scrappy robot.



Spirit landed on Mars at 8:35 p.m. PST on Jan. 3, 2004, and its twin Opportunity arrived at 9:05 p.m. Jan. 24, 2004. The rovers began missions intended to last for just three months but which have instead gone on for six Earth years, or 3.2 Mars years. During this time, Spirit has found evidence of a steamy and violent environment on ancient Mars that was quite different from the wet and acidic past documented by Opportunity, which has been operating successfully halfway around the planet.

A sand trap and balky wheels are challenges to Spirit's mobility that could prevent NASA's rover team from using a key winter-survival strategy. The team might not be able to position the robot's solar panels to tilt toward the sun to collect power for heat to survive the severe Martian winter.

Nine months ago, Spirit was driving across a place called "Troy" when its wheels broke through a crusty surface layer into loose sand. Efforts to escape this sand trap barely have budged the rover. The rover's inability to use all six wheels for driving has worsened the predicament. Spirit's right-front wheel quit working in 2006, and its right-rear wheel stalled a month ago. Surprisingly, the right-front wheel recently resumed working, though intermittently. Drives with four or five operating wheels have produced little progress and the latest attempts have resulted in the rover actually sinking deeper in the soil.

"The highest priority for this mission right now is to stay mobile, if that's possible," says Steve Squyres of Cornell University in Ithaca, N.Y. He is principal investigator for the rovers.

If mobility is not possible, the next priority is to improve the rover's tilt, while Spirit is able to generate enough electricity to turn its wheels. Spirit is in the southern hemisphere of Mars, where it is autumn, and the amount of daily sunshine available for the solar-powered rover is declining. This could result in ceasing extraction activities as early as January, depending on the amount of remaining power. Spirit's tilt, nearly five degrees toward the south, is unfavorable because the winter sun crosses low in the northern sky.

Left: The latest attempt to dislodge Spirit was not successful. On Dec. 26th the rover actually sunk 6 mm deeper into the sandtrap.

Unless the tilt can be improved or winds lessen the gradual buildup of dust on the solar panels, the amount of sunshine available will continue to decline until May 2010. During May, or perhaps earlier, Spirit may not have enough power to remain in operation.

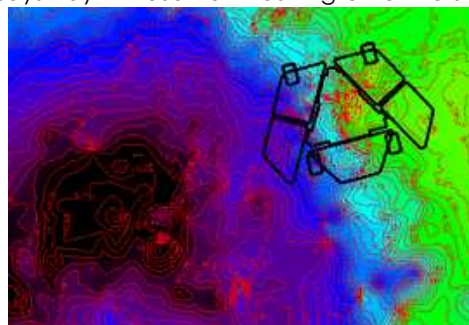
"At the current rate of dust accumulation, solar arrays at zero tilt would provide barely enough energy to run the survival heaters through the Mars winter solstice," says Jennifer Herman, a rover power engineer at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

The team is evaluating strategies for improving the tilt even if Spirit cannot escape the sand trap, such as trying to dig in deeper with the wheels on the north side. In February, NASA will assess Mars missions, including Spirit, for their potential science versus costs to determine how to distribute limited resources. Meanwhile, the team is planning additional research about what a stationary Spirit could accomplish as power wanes.

"Spirit could continue significant research right where it is," says Ray Arvidson of Washington University in St. Louis, deputy principal investigator for the rovers.

"We can study the interior of Mars, monitor the weather and continue examining the interesting deposits uncovered by Spirit's wheels."

Right: A topographic map of Spirit's surroundings at Troy. For more information about the science Spirit is able to do there, read the Science@NASA story "[Sandtrapped Rover Makes Big Discovery.](#)"



A study of the planet's interior would use radio transmissions to measure wobble of the planet's axis of rotation, which is not feasible with a mobile rover. That experiment and others might provide more and different findings from a mission that has already far exceeded expectations.

"Long-term change in the spin direction could tell us about the diameter and density of the planet's core," says William Folkner of JPL. He has been developing plans for conducting this experiment with a future, stationary Mars lander. "Short-period changes could tell us whether the core is liquid or solid."

Spirit may be stuck and in peril, but the rover still has a lot of work to do. Stay tuned for updates from Science@NASA.

[back](#)

Beyond the DaVinci Code - The Da Vinci Glow – credit Nick Greene

Most people associate Leonardo Da Vinci with the Mona Lisa or some of his fantastic inventions, many of which are just now coming into existence or, maybe, the Dan Brown Novel, The DaVinci Code. (In 2006, there's a much anticipated movie of The DaVinci Code, starring Tom Hanks.) Well, here's another way to consider Leonardo Da Vinci. From now on, think of the Moon, not a code.

Leonardo Da Vinci made this sketch of a crescent moon with Earthshine. It appears in the Codex Leicester. Beyond the DaVinci Code.

Many of you probably have never even heard of it, but one of



DaVinci's finest works is not a painting or an invention, but rather something from astronomy: He solved the ancient riddle of Earthshine.

Earthshine is visible whenever there's a crescent Moon on the horizon at sunset. Look between the horns of the crescent for a ghostly image of the full Moon. That's Earthshine.

The Old Moon in the New Moon's Arms

For thousands of years, humans marveled at the beauty of this "ashen glow," or "the old Moon in the new Moon's arms." But what was it? No one knew until the 16th century when Leonardo figured it out.

Today, the answer must seem obvious. When the sun sets on the Moon, it gets dark—but not completely dark. There's still a source of light in the sky: Earth. Our own planet lights up the lunar night 50 times brighter than a full Moon, producing the ashen glow.

Visualizing this in the 1500s required a wild kind of imagination. No one had ever been to the Moon and looked "up" at Earth. Most people didn't even know that Earth orbited the sun. (Copernicus' sun-centered theory of the solar system wasn't published until 1543, twenty-four years after Leonardo died.)

Wild imagination was one thing Leonardo DaVinci had in abundance. His notebooks are filled with sketches of flying machines, army tanks, scuba gear and other fantastic devices centuries ahead of their time. He even designed a robot: an armored knight that could sit up, wave its arms, and move its head while opening and closing an anatomically correct jaw.

An Appealing Riddle (DaVinci Code?)

To Leonardo, Earthshine was an appealing riddle. As an artist, he was keenly interested in light and shadow. As a mathematician and engineer, he was fond of geometry. All that remained was a trip to the Moon. It was a mental journey:

He was wrong about two things:

First, the Moon has no oceans. When Apollo 11 astronauts landed at the Sea of Tranquility, they stepped out onto rock. Lunar "seas" are made of ancient hardened lava, not water.

Second, Earth's oceans are not the primary source of Earthshine. Clouds are. Earth shines because it reflects sunlight, and clouds do most of the reflecting. When Apollo astronauts looked at Earth, the oceans were dark and the clouds were bright.

But these are quibbles. Leonardo understood the basics well enough.

Back to the Moon

In the decades ahead, humans are going to travel in person where Leonardo's imagination went 500 years ago. NASA plans to send astronauts back to the Moon no later than the year 2018. Unlike Apollo astronauts, who stayed for a few days at most, these new explorers will remain on the Moon for weeks and months. In the process, they'll experience something Apollo astronauts never did: nightfall. A lunar "day" is 29.5 Earth-days long: about 15 Earth-days of light, followed by 15 Earth-days of darkness. Apollo astronauts always landed in daylight and took off again before sunset. Because of the bright sun, they never saw the soft glow of Earthshine at their feet. But the next generation of astronauts will.

And just maybe, on a late-night stroll behind the outpost, guided by the soft light of Earth, one of them will bend over and scratch something in the moon dust:

"Leonardo was here."

[back](#)

Now Is Your Chance To Own A Piece Of History—

January 5/10 credit NASA.

Of course it would cost you \$42 million, but NASA is offering up the members of its space shuttle fleet. Naturally, NASA is offering the shuttles primarily to museums, so don't go reaching for your checkbook just yet. The price includes \$6 million for cleaning, shipping and handling. And you thought your shipping charges were outrageous...



The [Houston Chronicle](#) is reporting that about 20 institutions are interested in acquiring one of the two shuttles up for sale (the Smithsonian National Air and Space Museum has been guaranteed Space Shuttle Discovery). Of course, \$42 million is no small investment, so it will be interesting to see how many institutions are able to raise the funds necessary.

The shuttles are scheduled to be retired at the end of this year and will be replaced by the [constellation program](#), specifically the Orion Crew Module which relies on the new Ares Rocket.

[back](#)

Dark matter 'beach ball' unveiled – January 06/10 credit ScienceDaily

The giant halo of dark matter that surrounds our galaxy is shaped like a flattened beach ball, researchers say. It is the first definitive measure of the scope of the dark matter that makes up the majority of galaxies' masses.

The shape of this "dark matter halo" was inferred from the path of debris left behind as the Sagittarius dwarf galaxy slowly orbits the Milky Way. A team of US astronomers announced the findings at the American Astronomical Society meeting in Washington.

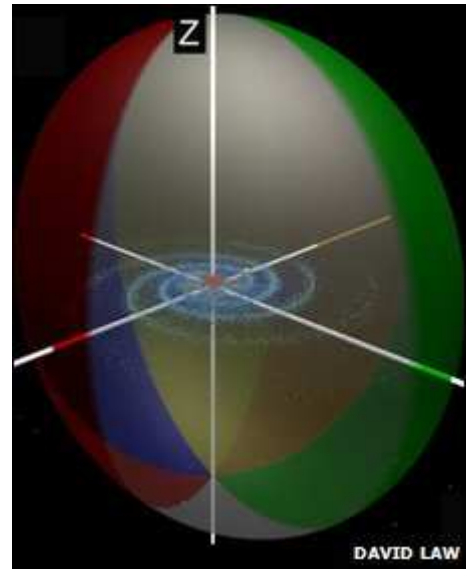
Dark matter is a mysterious kind of matter that makes up nearly a quarter of the universe, but does not interact with light and so has until now remained invisible to scientists.

Mass transit

However, because it has mass, it acts on matter as we know it through gravity.

"You can't actually see it directly, you can see it through its effects on stellar structure, star clusters, and dwarf galaxies orbiting around the Milky Way," explained David Law of the University of California, Los Angeles, the researcher presenting the work.

"So what you want to do is map where these star clusters and dwarf galaxies go and use that to reconstruct their orbits and where the mass is." Dr Law and his colleagues turned to the Sagittarius dwarf galaxy as one of the best-studied cosmic neighbours orbiting the Milky Way.



Left: The trail of matter left by an orbiting galaxy hints at the dark matter's shape

Using data from telescope surveys of stars across the full scope of the sky, including the Two Micron All-Sky Survey (2MASS) and the Sloan Digital Sky Survey, the team was able to identify individual stars that had been dragged out of the tiny Sagittarius galaxy as it skims past our galaxy.

But in thinking about the Milky Way's dark matter halo as a sphere surrounding it, something didn't fit; the positions of the galaxy and its apparent speed didn't line up.

Dr Law's team then came up with the idea that the halo might be different sizes in different directions, and allowed for this in their gravity model. What came out is what Dr Law described as a "cosmic beach ball, squashed from the side", flattened along the direction corresponding to the plane of the Milky Way. The fact that the un-flattened direction should be above and below the galactic plane remains a mystery.

"It's a little weird in current dark matter models, but it'll be very useful in helping constrain future models, not only of dark matter itself but also how galaxies such as our own form in the universe." The 215th American Astronomical Society meeting was confirmed on Wednesday as the largest astronomy meeting in history, with more than 3,400 attendees.

[back](#)

2010: The year of the baffling eclipse— January 05/10 credit AAVSO, Cambridge, Massachusetts

As 2010 begins, the first phase of a puzzling astronomical transformation comes to an end.

Right: An artistic representation of one model of the Epsilon Aurigae system as seen at high inclination.

In August 2009, amateur and professional astronomers reported that the bright star Epsilon Aurigae had begun to lose brightness for the first time in 27 years. It is believed that an eclipsing object of an unknown nature dims the star's light.

The first phase of the eclipse involved a dramatic drop in brightness over the course of a few months beginning in August. Professional and amateur astronomers teamed up to monitor the eclipse and have announced that this critical phase just ended around New Year's Day 2010.



Under normal circumstances, the star is bright enough to be seen from even the brightest of cities with just the naked eye. During eclipse, it nearly disappears from the skies of a naked-eye urban astronomer. One needs to be in a darker suburb to easily see it without helpful equipment such as binoculars.

"We have increasing evidence that a dark disk of material has moved in front of our view of Epsilon Aurigae," said Robert Stencel, scientific advisor for the project. "But the exact shape and makeup of the disk has been unknown, but it will be better defined soon. To make things even more challenging for us, some think there are multiple stars in the system, and perhaps planets spiraling into one of the stars."

Even during the eclipse, the star is so bright that sensitive equipment in professional observatories can have trouble monitoring its brightness in the optical wavelengths. Furthermore, large telescopes cannot afford to monitor one star continuously. This is where amateurs and citizen scientists step in.

"Amateurs are the ideal astronomers for this project," said Arne Henden, director of the American Association of Variable Star Observers (AAVSO). "Either with their naked eyes or with digital cameras, they have proven that they can record professional-quality data. They are also distributed around the world, which helps eliminate problems such as bad weather and equipment breakdowns."

"Just looking at the coverage in the visual data alone, I can already see interesting changes in the star that have never been seen so clearly before," Stencel said. He studied the last event in 1982-84 while working at NASA.

If past eclipses are any guides, then this dark stage will last nearly 18 months followed by a rapid return to its normal brightness in the first half of 2011. However, the star's brightness will continue to vary a bit during this dark stage, so amateur and professional astronomers are needed to continue vigilant monitoring.

Supported by a 3-year Informal Science Education grant from the National Science Foundation, Citizen Sky is recruiting, training, and coordinating public participation in this project. What makes this project different from previous citizen-science projects is its emphasis on participation in the full scientific method. Participants are not being asked simply to collect data. They will also be trained to analyze data, create and test their own hypotheses, and to write papers for publication in professional astronomy journals.

"Since our launch September 2009, over 2,000 participants have joined the project," Henden said. "Over 120 observers from 19 countries have submitted over 1,500 data points. However, most participants are participating in other ways. We have teams developing data-analysis software, using robotic telescopes, and even creating illustrations and diagrams to describe different models of the system."

[back](#)

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.

[back](#)

Ask an Expert

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

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

Are you new to astronomy? Want to know the how to find objects in the sky? Or just wondering what that bright object in the evening sky is? Well wonder no more; email [Bryon Thompson](#) our Public Outreach Officer and master of Astronomy 101 basics.

[back](#)

Family 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.

Winter Sky Tour Courtesy of Canadian Astronomy Education

On a clear, dark evening in January, February, or March you will be able to see the following...

<p>Constellations: Ursa Major (Big Dipper) Ursa Minor (Little Dipper) Draco (the Dragon) Cepheus (the King) Cassiopeia (the Queen) Leo (the Lion) Perseus (the Hero) Triangulum (the Triangle) Aries (the Ram) Pegasus (the Winged Horse) Andromeda (the Princess) Cetus (the Sea Monster) Orion (the Hunter) Canis Major (the Big Dog) Canis Minor (the Little Dog) Gemini (the Twins) Taurus (the Bull) Auriga (the Charioteer) Eridanus (the River) Cancer (the Crab) Hydra (the Water Serpent)</p>	<p>Bright Stars: Sirius (Canis Major) Procyon (Canis Minor) Rigel (Orion, right knee) Betelgeuse (Orion, right shoulder) Bellatrix (Orion, left shoulder) Castor (Gemini, right) Pollux (Gemini, left) Capella (Auriga) Aldebaran (Taurus) Regulus (Leo)</p>	<p>Open Clusters: Pleiades Hyades Nebulae: Orion Nebula Galaxies: Andromeda Milky Way</p>
--	---	---

How to find the constellations

The trick to locating a constellation is to start with those most familiar, and then use the pointer stars to find other constellations. It also helps to ensure that you know the four cardinal directions (North, South, East, and West).

When to observe

The story that follows will make the most sense if you observe the sky according to the following schedules.

Early January 10 pm to midnight

Late January 9 pm to 11 pm

Early February 8 pm to 10 pm

Late February 7 pm to 9 pm

Early March 6 pm to 8 pm

Let's begin...

Using the star chart below, orient yourself due North. From this vantage point we will find the constellation Ursa Major (the Big Dipper). The Big Dipper will be standing on end (the handle closest to the horizon) in the northeast sky. Using the two stars at the end of the pot, we can draw an imaginary line heading northward until we meet up with Polaris (the North Star). Polaris is the star at the very end (handle end) of Ursa Minor (the Little Dipper). Following the stars down the handle (of Ursa minor), we arrive at its bowl. Notice that the Big Dipper and the Little Dipper are always facing each other, so that in theory, something could be pouring out of the Little Dipper into the Big Dipper. The constellation snaking its way between the Little and Big Dippers is Draco (the Dragon). The head of the Dragon lies directly under the bowl of the Little Dipper.

Remembering how we found Polaris and the Little Dipper, if we continue to trace a line from the stars at the end of the Big Dipper's bowl, past Polaris, we arrive at the top of Cepheus (the King). The constellation Cepheus takes the form of a simple house (a triangle on top of a square) and the star that we just found is the top of the house. Sitting just next to (west of) King Cepheus is his wife, Queen Cassiopeia. Most often, Cassiopeia is identified by her "W" or "M" shape (winter = "W" & summer = "M"). Tracing its way through Cassiopeia is the hazy, cloudy appearance of the Milky Way. The reason we observe the haze is because we are looking out along the plane of the galaxy and as a result, there are so many stars very close together that they all wash together into a cloudy haze. The Milky Way traces its way across the entire northern sky from the extreme northwest horizon all the way to the extreme southeastern horizon. From a dark location, the haze of the Milky Way is a fascinating sight. Legend has it that Hercules' arrow flew aimlessly through the night sky, impacting on Queen Cassiopeia's bosoms and spewing her milk across the sky; hence the Milky Way.

Queen Cassiopeia and King Cepheus' daughter, Andromeda, sits just west of Cassiopeia. King Cepheus chained Andromeda to a rock beside the sea in an attempt to please the Cetus (the Sea Monster) who was greatly offended by Cassiopeia's suggestion that Andromeda was the finest lady in the land. Before the Cetus could devour Andromeda, however, Perseus (the Hero and son of Zeus, the king of the gods) mounted his winged horse (Pegasus) and saved Princess Andromeda's life. The two were married on the spot and lived happily ever after. On a clear, dark night, you might notice a small, fuzzy spot right close to one of Andromeda's legs. This is known as the Andromeda Galaxy, the only galaxy visible with the naked eye. The Andromeda Galaxy is a spiral galaxy some 3 million light years away that in most respects closely resembles our own Milky Way. If you were to observe the Andromeda Galaxy through a modest sized telescope, you might also notice that the large central galaxy is accompanied by two smaller companion galaxies (M32 and M110 -- both dwarf elliptical galaxies).

Filling most of the western sky is the great square of Pegasus (Perseus' winged horse), mentioned earlier. The constellations of Andromeda and Pegasus are in fact joined. After helping Perseus rescue Andromeda, Pegasus was promoted to Zeus' assistant, carrying his lightning bolts.

Lying adjacent to Andromeda and Pegasus are the rather small constellations Triangulum (the Triangle) and Aries (the Ram). Aries marks our first look at a zodiac constellation. The zodiac constellations consist of 13 constellations all lying along the ecliptic. The ecliptic is an imaginary line traced from east to west, marking the path the sun, moon, and all planets follow across the night sky.

Returning to The Big Dipper we can find yet another zodiac constellation. Using the other two stars of the bowl (the stars at the back end of the bowl), we can trace a line eastward to the constellation Leo (the Lion). The bright star marking the start of the Lion's tail is Regulus. Regulus is a B7V star and is the 25th brightest star in the sky.

Shall we continue?

All of the previous constellations were essentially found using the Big Dipper and her pointer stars.

The next batch of constellations will be found using Orion and its pointer stars.

To find Orion, orient yourself due South. Orion, marked by its seven bright stars, will be about halfway up from the horizon. If you let your imagination wander, one can use four of the seven stars to form the shoulders and knees of a human shape. The star depicting Orion's left shoulder is Betelgeuse, a large red giant star (spectral class M1-2Ia). Betelgeuse, shining a brilliant red-orange, is the 12th brightest star in the sky and stands in beautiful opposition to the blue-white Rigel (the star marking Orion's right knee). Rigel, a B8Ia star, is the 7th brightest star in the sky. Betelgeuse and Rigel look so different in color due to the fact that Betelgeuse is a much older star, probably nearing its death (perhaps several million years away), whereas Rigel is a relatively young star not more than a few million years old. (Note that stars live on average about 5 billion years.) The other three stars in Orion lie inclined slightly at the center of the shape, forming the appearance of a belt. Hanging from his belt lies Orion's sword, marked by three faint stars and a small fuzzy patch. The fuzzy patch, just barely visible with the naked eye, is the Great Orion Nebula (M42). It is believed that M42 is a huge star-forming region about 1700 light years away. The nebula is most likely a large glowing cloud of hydrogen gas, the essential element in star formation. The constellation of Orion (the Hunter) stands alongside his faithful dogs Canis Major (the Big Dog) and Canis Minor (the Little Dog), adjacent to the river Eridanus. Orion and his dogs seek Lepus (the Rabbit) and Taurus (the Bull). On one hunting adventure, Orion met a bitter end as he stepped on Scorpius (the Scorpion) and died. Feeling sorry for Orion, the gods placed him and his dogs in the sky as constellations. Scorpius was also placed in the sky, but rests at the extreme opposite side from Orion so as never to be able to harm Orion again.

To find Orion's large dog Canis Major, use the three stars of Orion's belt to draw a line to the southeast, shortly meeting up with Sirius, the brightest star in the night sky. Sirius, a bright A1V star, marks the head of Canis Major and its feet extend toward the horizon. To find Orion's smaller dog Canis Minor, use the two stars marking Orion's shoulders to draw a line eastward until you meet up with Procyon, a bright F5IV star which lies just under the only other star in the constellation.

Lying to the southeast of Procyon, is the constellation Hydra. Hydra was the mythological beast that took the form of a dog with 100 serpentine heads. Legend has it that Hydra had horribly bad breath and could kill simply by being looked at. Hercules, the great warrior, was given the task of killing the beast. As Hercules battled with the Hydra he found that as he cut off one of the beast's heads, another regenerated in its place. Hercules needed the help of Iolus, his charioteer, to burn the neck of the beast as Hercules chopped off the head, preventing it from growing back. When Hercules came to the last head, he found it was immortal, and as a result, he and Iolus trapped the head under a heavy rock preventing its escape. Hydra is the largest constellation in the sky.

The river Eridanus, another one of the larger constellations in the sky, lies to the southwest of Orion's knee Rigel. Eridanus is named after the once famous river in Northern Italy, now known as the River Po.

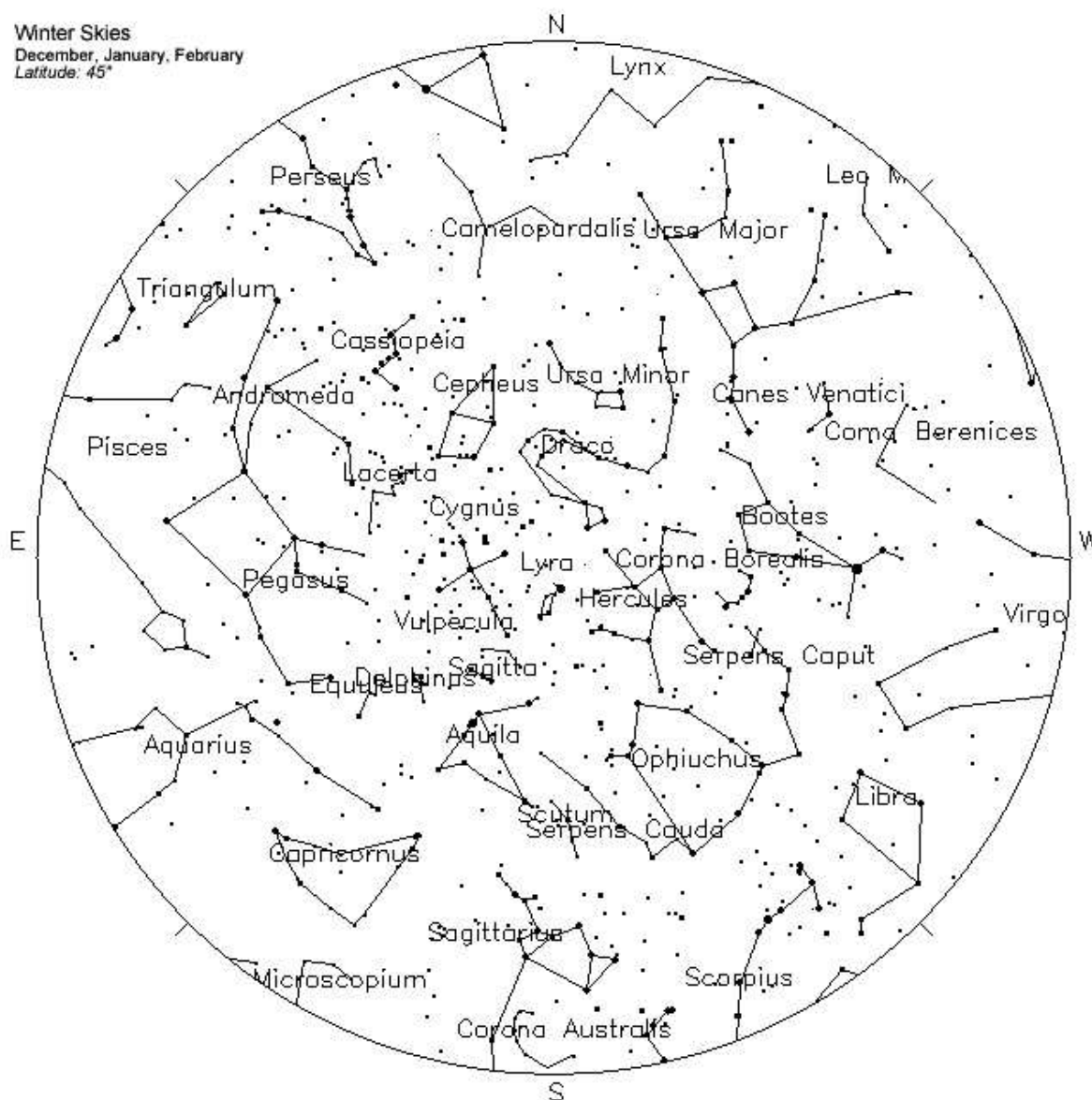
Taurus (the Bull), one of Orion's famous prey, can also be found using the stars of Orion's belt. This time trace a line in a northwest direction until you meet up with Aldebaran, the bright, orange star. Aldebaran, a huge red giant star (K5 III) about 40 times as large as our Sun, marks the eye of Taurus the bull. Taurus is also one of the 13 constellations of the zodiac. Taurus also contains two beautiful open star clusters, the Hyades and the Pleiades. Open star clusters are collections of tens to hundreds of stars occupying a relatively close area.

To find Gemini, the constellation of the twins, look to the northeast of Betelgeuse. The two bright stars, Castor and Pollux, mark the heads of the twins. Castor, an A1V, and Pollux, a K0IIIb, symbolize the twin Greek heroes who accompanied Jason on his voyages on the Argo, the famous Greek warship. Gemini is also one of the 13 constellations of the zodiac.

Moving further east along the ecliptic, we find Cancer (the Crab), a faint constellation said to have been a crab sent by the goddess Hera, to distract Hercules in his battle with the beast Hydra. Although Hercules was able to squash the crab with a single stamp of his foot, Hera saw to it that Cancer was placed in the sky to symbolize its effort, heroic yet pitiful.

Lying above Orion and straight up from our vantage point sit Auriga (the Charioteer) and its bright star Capella. Capella, a G5III, is the 6th brightest star in the sky and is a beautiful orange color.

Winter Skies
December, January, February
Latitude: 45°



[back](#)

The Sky This Month

By Bryon Thompson

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

Happy New Years everyone!

We are off to a rainy start but don't fret because drier weather will eventually be on the way and we will be able to benefit from the more transparent air that winter brings. This means good views of the stars of the Milky Way (the constellations Perseus, Auriga, Orion, and into Canis Major). The best of the three stars of Orion's belt are bright and form part of a lovely line north and west to see the bright orange star Aldebaran in Taurus, along with the Hyades star cluster which makes up the V-shape of the head of the bull. Keep going in this direction to find the "seven sisters" Pleiades, perhaps the finest sight in the sky for binocular observers. Follow Orion's belt in the other direction to Sirius and the fine star clusters in Canis Major.

Be sure to spend some time in the region around the Orion nebula. Check out the "batwing" shape of M42 "in Orion's armpit" along with the star cluster NGC 1981.

For you planet lovers, Mars takes centre stage as the best planet in the sky for observing. The red

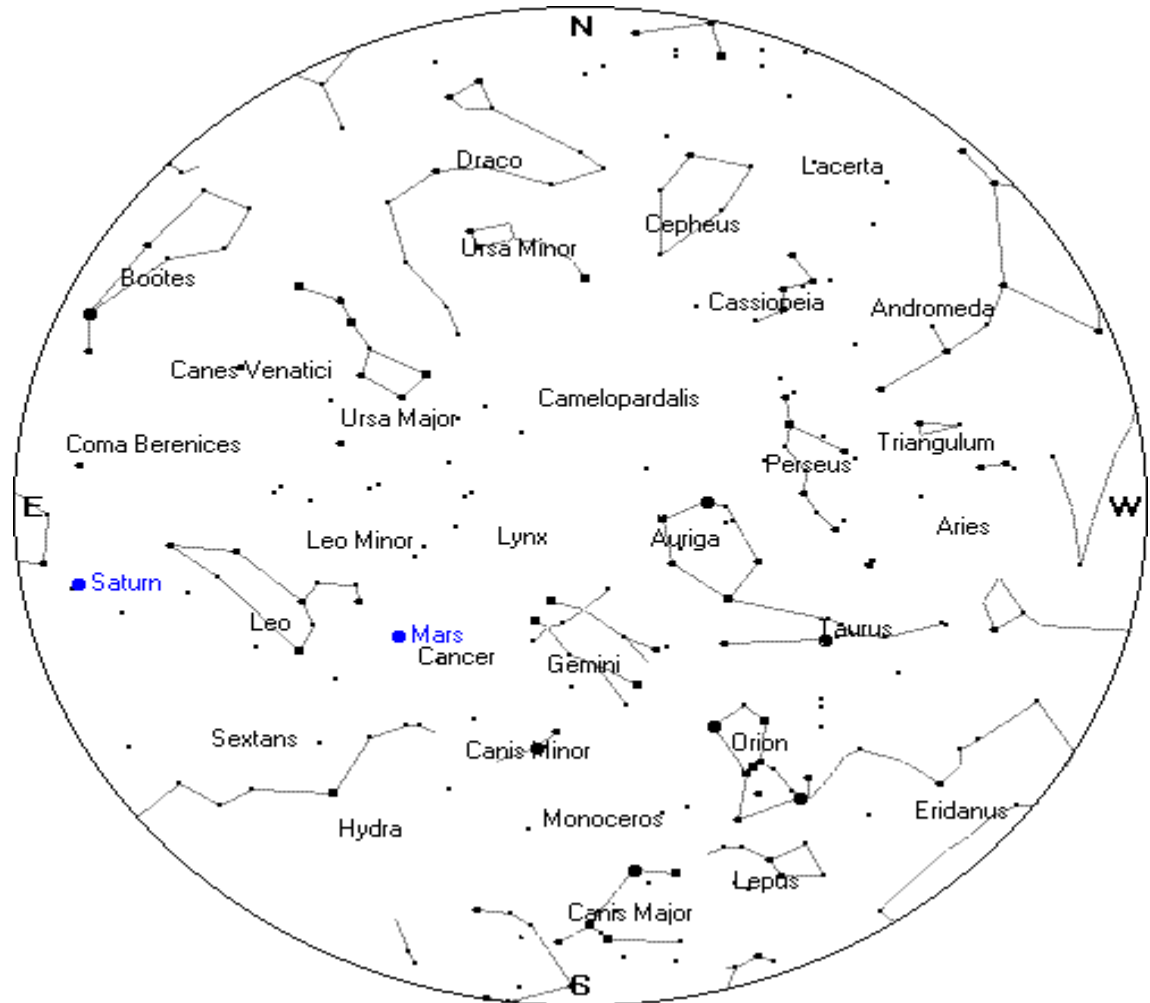
planet shines red, bright, and steady in the constellations Leo and Cancer this month, not far from the bright star Regulus. Mar's closest approach to Earth is on January 27th when it's 99.3 million km away; though it will be nothing like the opposition of August 2003, when Mars came within 56 million km. The planet peaks at magnitude -1.3. It is well worth the try to observe Mars, you may see some dark surface and possibly the polar cap, if you have a good scope and clear skies. The best time to observe the planet is between mid-January to mid-February.

The moon makes its closest approach to Earth this year on January 30. It will lie 356,000 km away, and will appear about 7% larger than average. This is a good time for you astrophotographers to get out your cameras and take a few shots. Be sure to send them in and we will post them on the website. Till then remember, Astronomy is looking up.

Moon:

Jan. 7	10:39 UT	Last Quarter
Jan. 15	7:11 UT	New Moon
Jan. 23	10:53 UT	First Quarter
Jan. 30	6:18 UT	Full

Sky Chart —Here's your mid-January 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

[back](#)