



Clear Skies

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1. Greetings!

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

Well the 34th annual Victoria Flower Count for 2010 has come and gone in the City of Gardens. They must have had a daunting task this year as we couldn't have asked to a better end to winter. Our actual first day of spring arrives on March 20th and before we officially begin to enjoy our spring we have "daylight savings" to get through. Remember Set your clocks ahead one hour at 2:00 AM, Sunday March 14. While your keeping note of all these dates, don't forget to mark you calendars for our next social on March 24th at 7:30. Ed informs me that he has something brewing, however, at the time of this newsletter the presenter is still TBA. Keep tabs on your email as we will notify you as soon as we know.

Thanks to Chris M for her very informative feature at last month's social. It was really interesting to see the people behind the famous astronomers. Did you Know this month is dedicated to Women in Astronomy? Caroline Herschel is credited as being the "First Lady of Astronomy". Read more about our famous women in "This month in History" section. For more information on Christina's presentation, check out Joe's comments in "Social Highlights".

Welcome to Rod V who recently became CVSF member #85. It is always great to see new faces and as far as we are concerned the more the merrier.

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

By Freda Eckstein

"Astronomers, like burglars and jazz musicians, operate best at night"- Miles Kington
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2. Socials

Socials are held on the **4th Wednesday of each month** at the home of Bryon and Freda. 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 March 24th**
Feature:"TBA". We will notify you via email as soon as we hear.

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Highlights – Feb 24/10

By Joe Carr

Started: 7:45pm Attendees: 18

1. Bryon welcomes everyone.
2. Doug won the Elvis, Pink Floyd, Hemmingway contest
3. "Amateur Contribution to the Science of Astronomy, Astronomical Science: not just for academics" – by Christina Martens
 - a) Several amateur astronomers who made noteworthy astronomical discoveries were highlighted
 - b) Equipment and methodologies were discussed – exotic gear not always required
 - c) Objects to be studied: asteroids, comets, exoplanets, solar system objects, the Sun
 - d) Resources: American Association of Variable Star Observers <http://www.aavso.org/>;
Czech Astronomical Society's Variable Star and Exoplanet section <http://var2.astro.cz/EN/>;
North American Meteor Network <http://www.namnmeteors.org/>; Cloudy Nights <http://www.cloudynights.com> – forums.
 - e) Discussion ensued on how to get started.

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3. Upcoming Events



March 3-16, 2010 - GLOBE at Night

An annual 2-week campaign where people all over the world record the brightness of their night sky by matching its appearance toward the constellation Orion with star maps of progressively fainter stars. They submit their measurements on-line and a few weeks later, organizers release a map of light-pollution levels worldwide. If you are interested in participating see <http://www.globeatnight.org/>

March 12-13, 2010 – Messier Marathon - Victoria Centre Observatory (VCO) and environs on Observatory Hill. Be sure to sign up for this, our second annual event! **Please note: all participants must be members of RASC.** For more information see <http://victoria.rasc.ca/events/MessierMarathon/Default.htm>

NASA Launches credit NASA.Com:

Date: March 2

Mission: GOES-P

Launch Vehicle: United Launch Alliance Delta IV

Launch Site: Cape Canaveral Air Force Station - Launch Complex 37

Launch Window: 6:19 - 7:19 p.m. EST

Description: GOES-P is the latest in a series of meteorological satellites designed to watch for storm development and weather conditions on Earth.

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4. This Month In History

Courtesy of: Nick Greene, About.com

March is Women's History Month

This month we celebrate the contributions of women in the history of astronomy and space. Here are but a few of an ever expanding list of women we recognize:

- **Hypatia** - mathematician, astronomer, and Platonic philosopher.
- **Caroline Herschel** - First Lady of Astronomy.
- **Mary Somerville** - Contemporary of Caroline Herschell.
- **Mercury 13 First Lady Astronaut Trainees (FLATs)** • Jerrie Cobb • Wally Funk • Irene Leverton • Myrtle "K" Cagle • Janey Hart • Gene Nora Stombough [Jessen] • Jerri Sloan • Rhea Hurrle [Woltman] • Sarah Gorelick [Ratley] • Bernice "B" Trimble Steadman • Jan Dietrich • Marion Dietrich • Jean Hixson
- **Maria Mitchell** - First American woman astronomer.
- **Williamina Fleming** - Breaking gender barriers at Harvard.
- **Valentina Tereshkova** - First woman in space.
- **Dr. Sally Ride** - First American woman in space.
- **Dr. Mae Jemison** - First African-American woman in space.

- **Dr. Judith Resnick** - Hero who lost her life aboard the space shuttle Challenger.
- **Christa McAuliffe** - Hero who lost her life aboard the space shuttle Challenger.
- **Kalpana Chawla** - Hero who lost her life aboard the space shuttle Columbia.
- **Laurel Clark** - Hero who lost her life aboard the space shuttle Columbia.
- **Dr. Beth Brown** - NASA Astrophysicist.
- **Eileen Collins** - First woman to pilot a space shuttle, first woman to command the space shuttle, commander of the return to flight mission after Columbia disaster.

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5. 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".

Get ready for the upcoming Star Parties by signing up for:

Astronomy 101 - Online Basic Astronomy Course is a free ten lesson course. Learn a little about the history of astronomy as well as our universe and how to view the night sky. Earn your certificate from the Astronomy 101 - Online Basic Astronomy Course <http://space.about.com/gi/pages/stay.htm>

Maas Digital created this animation of the Mars Exploration Rover mission for Cornell University and NASA/JPL in 2003. Very realistic.

http://www.youtube.com/watch?v=-9BYSdtwRc&feature=player_embedded#

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>

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6. Featured Articles

Articles

[RETURN TO CATEGORIES](#)

1. [Spirits Journey to the Centre of Mars](#)
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3. [Phobos Flyby Success](#)
4. [Exotic Antimatter Created on Earth](#)
5. [NASA Uses Fish to Fight Space Sickness](#)

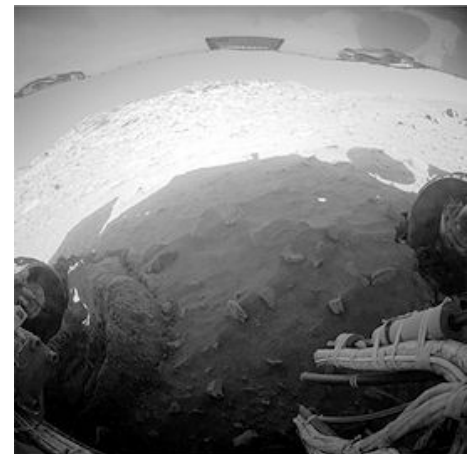
Spirit's Journey to the Center of Mars – February 24/10 credit Science@NASA

Mars rover Spirit has tenaciously swept, scraped, and squeezed secrets from the forbidding surface of Mars for 6 years. Now at an impasse, up to its belly in sand, it has struggled to tilt its solar panels toward the sun and collect just enough power to survive the perilously cold Martian winter. If Spirit can make it through to spring, the feisty robot will prove it's still in the game—by solving the mysteries of the Martian core.

Unlocking those secrets will require the guile of a veteran explorer. Like a wily old baseball pitcher who uses knuckle balls to keep winning, the aging Spirit still has a few tricks up its sleeve. It will do its next trick without moving a single mechanical muscle.

Right: Spirit's view of its own predicament. The rover is now parked for the winter with its solar panels tilted only 9 degrees toward the sun. "In this case, it's a good thing Spirit is immobile," says principal investigator Steve Squires. "We can track its radio signal to determine its motion through space."

Mars is rotating around its own axis and orbiting the Sun. With the rover stationary, the radio's only motion will be the motion of Mars. Because the scientists already know the specifics of the red planet's orbit, they'll be able to use Spirit's radio signal to hone in on how the planet spins around its own axis.

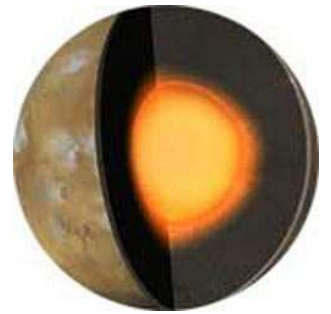


"Mars wobbles, or precesses, as it spins," says Bruce Banerdt of NASA's Jet Propulsion Laboratory. "We'll measure that wobble by looking at the timing of the radio signal—how long it takes to go back and forth between Spirit's transmitter and our receivers on Earth." "Mars completes an entire wobble only once every 170,000 years," he continues. "So we'll be measuring a very tiny motion—looking at minute changes. But these miniscule numbers speak volumes about Mars' core."

First, it will help scientists figure out if the core is solid or liquid. There are clues that it was molten at some time in the ancient past. A molten core is a fluid that moves and conducts electricity, so it sets up a powerful magnetic field. Researchers see remnants of that field today but are unsure how much of the core, if any, is still molten.

"If Mars' core is solid through and through, the nature of the wobble will be subtly different from the wobble if the core is liquid," says Squires. Spin a hard-boiled egg and then spin a raw egg. You'll see a distinct difference in the way they rotate.

Right: An artist's concept of the Martian core. Credit: NASA/JPL.



Spirit's radio signals will also reveal the precise speed of Mars' wobble. That, in turn, will help the researchers calculate the planet's moment of inertia, or MOI.

The moment of inertia of a spinning object—in this case, a planet—is a number that describes how easy or how hard it is to change the spin. "The MOI affects the speed at which the axis of Mars wobbles, so the wobble speed indirectly tells us the MOI," says Banerdt. They'll add the MOI to what they already know about Mars—its size and mass. "Combining these three things with our understanding of how iron and rock behave inside a planet will allow us to set limits on the size and density of the Martian core. And the density will tell us what elements must be mixed with iron to make up the core."

"This research has implications that reverberate through all kinds of basic questions about the formation of the solar system and its planets. I have to tip my hat to Spirit. It keeps coming up with new tricks." But first the rover has to survive the long, hard winter. Baseball great Rogers Hornsby summed it up: "People ask me what I do in winter when there's no baseball. I'll tell you what I do. I stare out the window and wait for spring."

Make that Martian spring

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Chilean Quake May Have Shortened Earth Days- March 1/10 credit JPL NASA.com

The Feb. 27 magnitude 8.8 earthquake in Chile may have shortened the length of each Earth day.

JPL research scientist Richard Gross computed how Earth's rotation should have changed as a result of the Feb. 27 quake. Using a complex model, he and fellow scientists came up with a preliminary calculation that the quake should have shortened the



length of an Earth day by about 1.26 microseconds (a microsecond is one millionth of a second).

Perhaps more impressive is how much the quake shifted Earth's axis. Gross calculates the quake should have moved Earth's figure axis (the axis about which Earth's mass is balanced) by 2.7 milliarseconds (about 8 centimeters, or 3 inches). Earth's figure axis is not the same as its north-south axis; they are offset by about 10 meters (about 33 feet).

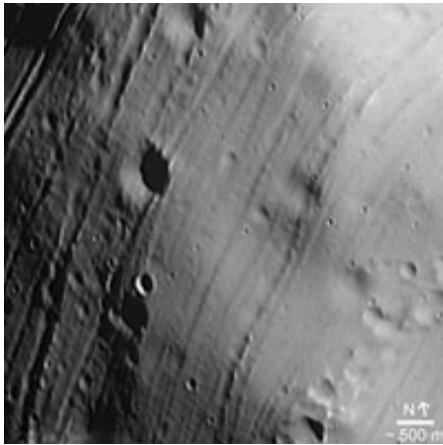
By comparison, Gross said the same model estimated the 2004 magnitude 9.1 Sumatran earthquake should have shortened the length of day by 6.8 microseconds and shifted Earth's axis by 2.32 milliarseconds (about 7 centimeters, or 2.76 inches).

Gross said that even though the Chilean earthquake is much smaller than the Sumatran quake, it is predicted to have changed the position of the figure axis by a bit more for two reasons. First, unlike the 2004 Sumatran earthquake, which was located near the equator, the 2010 Chilean earthquake was located in Earth's mid-latitudes, which makes it more effective in shifting Earth's figure axis. Second, the fault responsible for the 2010 Chilean earthquake dips into Earth at a slightly steeper angle than does the fault responsible for the 2004 Sumatran earthquake. This makes the Chile fault more effective in moving Earth's mass vertically and hence more effective in shifting Earth's figure axis.

Gross said the Chile predictions will likely change as data on the quake are further refined.

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Phobos Flyby Success – March 4/10 credit ESA



Mars Express encountered Phobos last night, smoothly skimming past at just 67 km, the closest any manmade object has ever approached Mars' enigmatic moon. The data collected could help unlock the origin of not just Phobos but other 'second generation' moons.

Something is not right about Phobos. It looks like a solid object but previous flybys have shown that it is not dense enough to be solid all the way through. Instead, it must be 25-35% porous. This has led planetary scientists to believe that it is little more than a 'rubble pile' circling Mars. Such a rubble pile would be composed of blocks both large and small resting together, with possibly large spaces between them where they do not fit easily together.

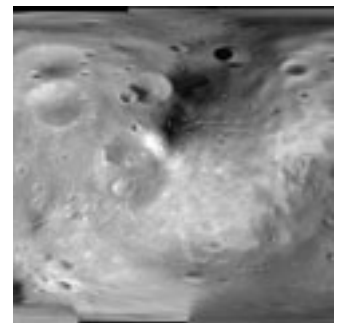
Last night's flyby was close enough to give scientists their most exquisite data yet about the gravitational field of Phobos. Mars Express locked onto the radio signal from Earth at around 21:20 CET (20:20 UT). The radio frequency oscillators on the ground are 100 000 times more stable than those on the spacecraft, so for this experiment, which required the best precision possible, the signal was sent up to Mars Express and then returned by the spacecraft to the ground.

The radio waves travel at the speed of light and took 6 minutes 34 seconds to travel from Earth to the spacecraft last night. So the round trip time was 13 minutes 8 seconds. Once the signal was received back at Earth, it was clearly strong and good. So strong that radio amateurs were also able to lock onto the signal, although their equipment would not be able to detect the subtle variations induced by the gravity of Phobos.

Now that the data are all collected, the analysis can begin. First will be an estimate of the density variation across the moon. This will tell scientists just how much of Phobos' interior is likely to be composed of voids.

"Phobos is probably a second-generation Solar System object," says Martin Pätzold, Universität Köln, Cologne, Germany, and Principal Investigator of the Mars Radio Science (MaRS) experiment. Second generation means that it coalesced in orbit after Mars formed, rather than forming concurrently out of the same birth cloud as the Red Planet. There are other moons around other planets where this is thought to have been the case too, such as Amalthea around Jupiter.

Whatever the precise origin, Phobos will eventually crumble back into

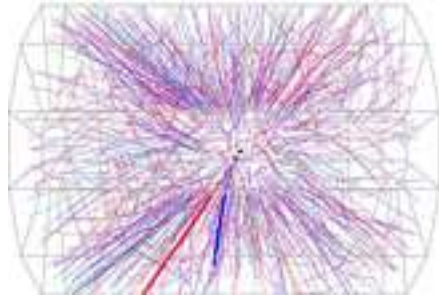


this disrupted state. It is gradually spiralling towards Mars and will eventually be pulled apart. "It came from debris, it will return to debris," says Pätzold. In the meantime, it is there to be studied and explored.

Last night's flyby was just one of a campaign of 12 Mars Express flybys taking place in February and March 2010. For the previous two, the radar was working, attempting to probe beneath the surface of the moon, looking for reflections from structures inside. In the coming flybys, the Mars Express camera will take over, providing high resolution pictures of the moon's surface.

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Exotic Antimatter Created on Earth – March 5/10 credit *Space.com*



Scientists have created a never-before seen type of exotic matter that is thought to have been present at the earliest stages of the universe, right after the Big Bang.

The new matter is a particularly weird form of antimatter, which is like a mirror-image of regular matter. Every normal particle is thought to have an antimatter partner, and if the two come into contact, they annihilate.

The recent feat of matter-finkering was accomplished by smashing charged gold atoms at each other at super-high speeds in a particle accelerator called the Relativistic Heavy Ion Collider at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory in Upton, N.Y.

Among the many particles that resulted from this crash were bizarre objects called anti-hypertritons. Not only are these things antimatter, but they're also what's called strange matter. Where normal atomic nuclei are made of protons and neutrons (which are made of "up" quarks and "down" quarks), strange nuclei also have so-called Lambda particles that contain another flavor of quark called "strange" as well. These Lambda particles orbit around the protons and neutrons.

If all that is a little much to straighten out, just think of anti-hypertritons as several kinds of weird. Though they normally don't exist on Earth, these particles may be hiding in the universe in very hot, dense places like the centers of some stars, and most likely were around when the universe was extremely young and energetic, and all the matter was packed into a very small, sweltering space. "This is the first time they've ever been created in a laboratory or a situation where they can be studied," said researcher Carl Gagliardi of Texas A&M University. "We don't have anti-nuclei sitting around on a shelf that we can use to put anti-strangeness into. Only a few anti-nuclei have been observed so far."

These particles weren't around for too long, though – in fact, they didn't last long enough to collide with normal matter and annihilate. Instead they just decayed after a fraction of a billionth of a second. "That sounds like a really short time, but in fact on the nuclear clock it's actually a long time," Gagliardi told SPACE.com. "In that fraction of a billionth of a second that Lambda particle has already gone around the nucleus as many times as the Earth has gone around the sun since the solar system was created."

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NASA Uses Fish to Fight Space Sickness – March 5/10 credit *Space.com*

Astronauts love doing zero-G stunts on the International Space Station, but only after the urge to vomit from space sickness has faded. Now fish, snails and other animals could help understand whether living in space can create long-term or even permanent damage in the inner ear.

Scientists found that the inner ears of toadfish have high sensitivity to even the slightest movements, and that the toadfish brain can both boost and reduce signals from the sensitive inner ear. Because humans have very similar ear structures to these and other animals, toadfish could provide clues about how astronauts' inner ears adapt to spaceflight. "You can drop a fish's inner ear right into a human and it fits right in there," said Richard Boyle, a biologist at the NASA Ames Research Center in Moffett Field, Calif.

Humans do eventually adjust to living in a weightless environment. But their inner ears have to go

through a second round of readjustment to full Earth gravity once they return — and scientists still don't know how easily the inner ear can make that switch after longer space missions.

Boyle's work is detailed in a study published in the February issue of the journal *Proceedings of the National Academy of Science*. His co-researchers included lead author Stephen Highstein, a marine biologist at the Marine Biological Laboratory in Woods Hole, Mass., and Richard Rabbitt, a bioengineer at the University of Utah in Salt Lake City.

Getting your space bearings

Living beings evolved inner ears with hair cell sensory organs that can detect sounds as well as movements of the head. The balance sensory organs include tiny ear stones made of calcium carbonate that act as small weights because of gravity.

When the head moves, the inertial lag of such stones creates force on the hair cells — not unlike how car passengers will feel the press of inertial lag when their vehicle jerks forward from a standstill. That signal gets amplified so that the brain automatically registers even the smallest head movements. The inner ear similarly detects bigger events such as the sudden drop when a person steps off a curb. The system works beautifully on Earth, but quickly leads to disorientation and nausea for spaceflyers who first experience weightlessness in space. "When you're up in space, you still have mass but no weight," Boyle told SPACE.com. "So you can't detect gravity, and the structures sensitive to inertial acceleration and orientation with respect to gravity lose their properties." Inner ears go haywire for a few days before the brain takes charge to regain a sense of balance. The nervous system also begins boosting the signal strength from the inner ear, so that the human or animal becomes hypersensitive to movement.

To adapt or not adapt

That works until astronauts return to Earth and become incredibly sensitive when just taking a step or turning their heads. Boyle has seen a similar hypersensitivity in snails that have returned to Earth after launching aboard Russian space missions.

Humans' ability to adapt quickly to the feeling of zero-G has proved a blessing for now, even if it baffles scientists. Our species has necessarily adapted to changes in predators and climate throughout history, but there's no obvious reason for why it should adapt so quickly to changes in gravity. "The brain probably begins right away," Boyle said. "It's amazing when you think that for all of human history on Earth, gravity has always remained the constant."

Boyle also noted the darker possibility that the brain's eagerness to adapt to the lack of Earth's gravity may prove harmful in the long run. Perhaps a point of no return exists where the inner ear and brain adjusts permanently to zero-G, and the body simply breaks down and absorbs the ear stones. Some human patients on Earth already suffer from dizziness and other conditions because their ear stones begin breaking down. But scientists remain uncertain whether astronauts could suffer the same fate from living in space too long. The current record for living in space goes to cosmonaut Valeri Polyakov, who spent almost 438 days aboard the Russian Mir space station. Yet Boyle noted that scientists often lack access to astronauts after they return to Earth, and so it's difficult to carry out long-term health studies on space travelers.

Living long and prospering in space

The recent study on toadfish necessarily took place on Earth because of its complexity in monitoring the animals' brain signals. But scientists hope to someday see similar experiments take place in space. "The experiment I'd like to do right now is a short-duration launch profile done on a suborbital flight, where you record neural activity during the acceleration of launch, the initial periods of microgravity, and during the return," Boyle explained.

Fish might also prove a good candidate for longer studies that send animals to Mars or beyond, given that they can live for 40 or 50 years. Lab rats or mice would have long since died. Doing such studies before sending humans on longer-duration space missions would seem prudent at the very least, according to Boyle. "When something goes wrong [with the inner ear], patients in the clinic are on the ground and they don't know if they're up or down or swimming or flying," Boyle said. "In the wild, an animal would be dead."

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7. Buy and Sell

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

For Sale : Telescope and mount package “offers on \$1800 Cdn “
Please contact [Gail Roberson 250-715-1116](#)

DETAILS:

Telescope Optical Tube

- Celestron 8" Schmidt Cassigrain Telescope with XLT coating model year 2002?)
 - Tube rings and vixen style dovetail bar to fit scope
 - Celestron 25mm Modified Achromat eyepiece
 - Celestron 10mm Modified Achromat eyepiece Antares 8x50mm - Finder scope with illuminated reticule and quick release bracket
 - Celestron Radial Guider (off axis), model 94176
 - Celestron f/6.3 Reducer/Corrector (focal reducer)
 - 12.5mm Illuminated Reticule eyepiece (Skywatcher ?)
- * Some scratches on scope, but overall in good condition.

EQ6 Mount

- Sky Watch EQ-6 Heavy Duty Mount, (black) with EQ-6 SynScan GOTO Upgrade kit
 - Steel tripod with 2" legs.
 - Two counterweights
 - Home made wheel cart (mount sits on top, not attached)
 - All cables, chargers and adapters
- * Some paint chips, ran well as of last use. Used for astrophotography

Software and Manuals

- The Sky Level 1, v.5
- NextStar Observer List, v.2.0.2c
- Imaginovia
- Starry Night Skytheater (DVD)
- Starry Night v. 6 Users Guide
- Starry Night v.6 Companion

Additional

- USB to Serial adapter (Hap Griffin) for Nikon T-adapter for Nikon
- The Backyard Astronomer, Dickinson and Dyer
- A Guide to the Night Sky, Burnham, Dyer et tel
- Voyages to the Stars and Galaxies, Fraknoi, Morrison, Wolff

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8. Ask an Expert

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

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

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

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9. Kids Korner

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

Amazing Liquid Light – Credit WWW.WONDERVILLE.CA

When light doesn't travel in a straight line.

What you need

- a tall, slim glass jar with a screw on lid
- newspaper
- flashlight
- hammer
- large nail and a thin nail
- sink or container
- duct tape

What to do

1. Ask for help to make two holes in the jar lid.
2. Using the hammer and nails, make a large hole near one edge and a smaller hole near the opposite edge.
3. Tape the flashlight to the bottom of the jar so the light shines into the jar.
4. Wrap newspaper around the jar and the flashlight so no light escapes. Do not cover the lid of the jar.
5. Pour water into the jar until it is full.
6. Put the lid on tightly.
7. Now you can "pour" light. In a very dark room, turn on the flashlight and pour water out through the largest hole into a sink or container (the small hole allows air to be replaced in the jar).

Observation

- Does the light beam shine straight ahead through the hole in the lid, or does it stay inside the stream of water?
- What happens to the light if you put your finger in different parts of the stream?

Why?

Light does travel in a straight line but there are times when it doesn't. Water bends light. The path of the light is bent in the water. Then it reflects back and forth off the inside surface of the water in the stream.

Did you know?

Light is a sequence of vibrations, sort of like sound vibrations. Scientists discovered how to control light vibrations to send information. So, when you talk on the telephone, the vibrations of your voice are changed into laser light. Lasers are used because they produce light vibrations that can travel along in a narrow beam of light through optical fibres, which are strands of material that allow light to travel in the same sort of way that the light traveled through the water in the activity.

The person you are talking to hears your voice when the light beams are changed back into sound vibrations.

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10. The Sky This Month

By Bryon Thompson

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

The sky this month March 2010-03-06

With spring peaking just over the horizon we can look forward to more and more clear skies now as the evenings get a little warmer and clearer.

Venus is bright at magnitude -3.9 but lies so very close to the horizon that it is lost to most of us out here in tall tree land. We will have to wait until the end of the month to see it a little better. It sets 30 minutes after the sun does in the beginning of the month and almost an hour after the sun nearer the end of March. If you have a good vantage point, watch for a thin crescent moon only 1% lit join the inner planet on **March 16** just 7° above it. The thin crescent grows slowly as the moon climbs higher and higher each night and on the 20th a much larger crescent sits in the sky among the new stars of the Pleiades. When Venus reaches its high point near the end of March try to see if you can find little Mercury just 3° below it and almost lost in the early evening twilight.

Mars continues to fade from magnitude -0.6 to 0.1 throughout March. Mars' westward motion will stop this month and start to move eastward near the middle of March. The little red planet's best views were in January but it still gives up some good sights to those with moderate sized telescopes, 10" or better.

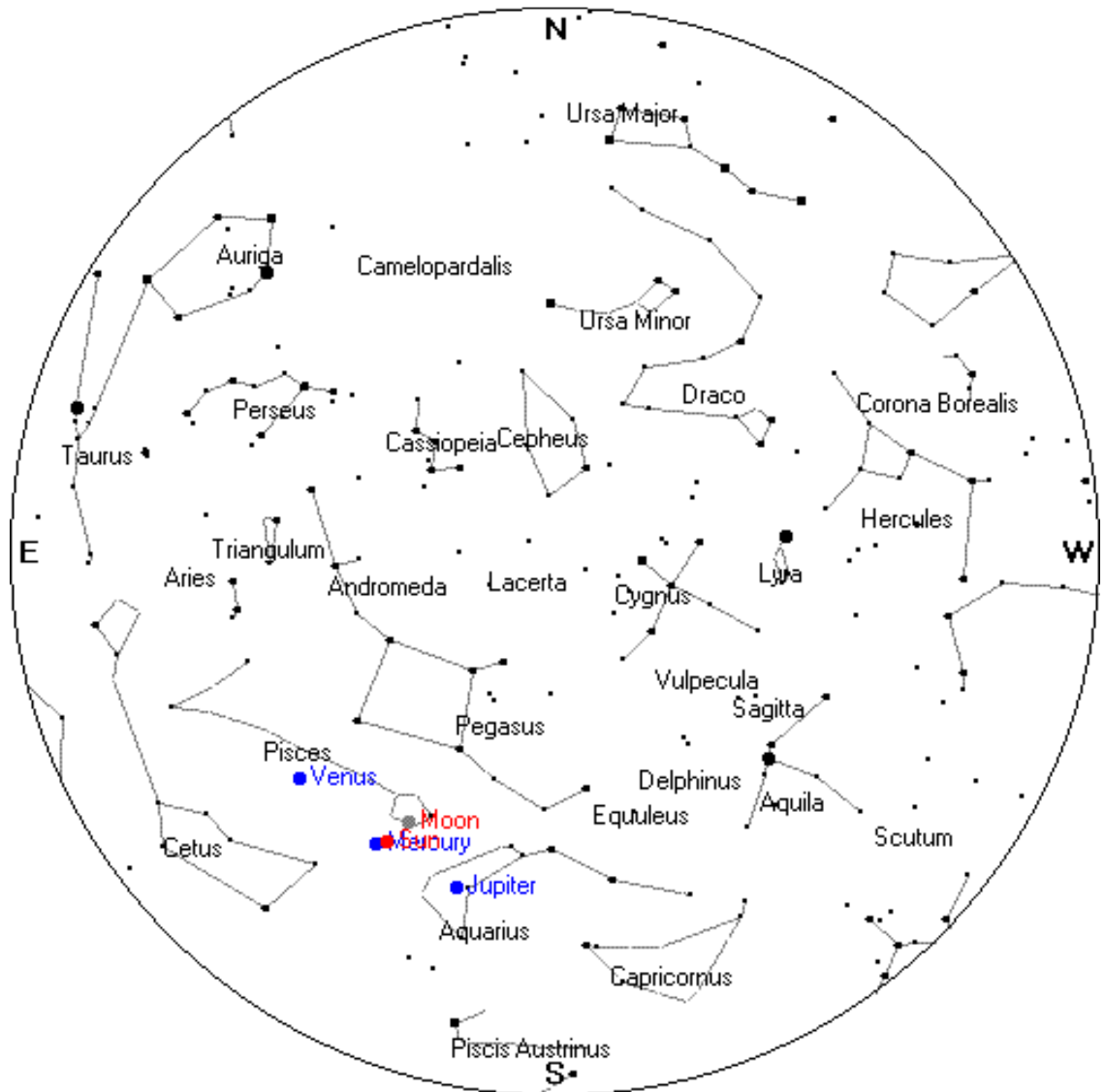
The big player this month is the returning giant, Saturn. Moving toward opposition (opposite the sun) on the **21st**. The large ring system that reached an "edge on" appearance late last year is back to only 3°, but is showing us the northern face of the rings. We haven't seen this side of them for the last 15 years. Although the ring system is usually the target of most Saturn observers, the big planet's moons present a good alternate while the rings are less pronounced. The ones to look for are Titan of course at 8th magnitude and Tethys, Dione and Rhea, all at 10th magnitude. These last three require at least a 6 inch scope. If you have a 10 inch or better on **March 9th** try to see little two toned Iapetus at magnitude 11 and the two smaller inner moons Mimas and Enceladus.

Jupiter is all but lost to western viewers as it rises late in the morning sky just 50 minutes before sunrise and at magnitude -2.0 is bright and hides in the early morning glow.

If you are able to get out and do a little looking around in March keep your eyes peeled for those pesky sporadics. March has no regular meteor shower but on average there are about 5 sporadic meteors on just about any night. A good view of a meteor or a look at the ISS is always a highlight when you're out viewing. Also there is one truth about viewing outside with a companion or two; you can be sure you've missed a sporadic if you hear that standard statement "Wow! Did you see that one?"...because if they have to ask, then you missed it! Happy viewing everyone. Remember, Astronomy is looking up.

Mar 7	07:42 AM PST	Last Quarter Moon
Mar 11	01:00 Am PST	Mars is stationary
Mar 15	02:01 PM PST	New Moon
Mar 20	10:32 AM PST	Vernal Equinox (officially spring) ☺
Mar 21	06:00 PM PST	Saturn at Opposition
Mar 23	04:00 AM PST	First Quarter Moon
Mar 29	04:25 PM PST	Full Moon

Sky Chart —Here's your mid-March 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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