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Greetings!

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

February has always struck me as a kind of strange month, first of all there's that extra day thrown in usually every four years known as a leap year. The extra day is needed in order to keep the calendar year synchronised with the astronomical or seasonal year because the earth does not orbit around the sun in precisely 365 days.

Then of course, we have groundhog day on February 2nd and that age old myth that "If the Groundhog sees his shadow, it means six more weeks of winter. If he doesn't see his shadow, it means spring is just around the corner." Not only do we base our weather predictions on the groundhog we actually rely on two of these meteorological phenomenas. We have "Punxsutawney Phil" who made his first official weather predication on February 2, 1887 in the town of Punxsutawney, Pennsylvania. Then we have the Canadian "Warton Willie" who is based in the town of Warton in Bruce County, Ontario where in 1956 Warton Willie began making his "weather predicitons". Well here's hoping they "don't see their shadows, I've had enough of winter!

Now if you stuck inside for the next six weeks lets hope you there with your sweetheart, because Valentines is just around the corner on February 14th. I know your probably saying "bah humbug" its another attempt at comercialism. You know I figure there is just not enough people telling each other how much they mean to them and if some of us need a special day to remind us of those special people then who am I to "rain on their parade". So, I've did some research to help you out this Valentines and here's what I came up with:

DID YOU KNOW?

Watermelon May Have Viagra-effect

ScienceDaily (July 1, 2008) — A slice of watermelon has long been a summer picnic staple. But according to recent studies, the juicy fruit may be better suited for Valentine's Day. That's because scientists say watermelon has ingredients that deliver Viagra-like effects to the body's blood vessels and may even increase libido.

Red Enhances Men's Attraction To Women,

ScienceDaily (Oct. 28, 2008) — A Psychological Study Reveals groundbreaking study by two University of Rochester psychologists which demonstrates a parallel in the way that human and nonhuman male primates respond to "red," Our findings confirm that men act like animals in the sexual realm. As much as men might like to think that they respond to women in a thoughtful, sophisticated manner, it appears that at least to some degree, their preferences and predilections are, in a word, "primitive."

Amethyst is the gemstone for February

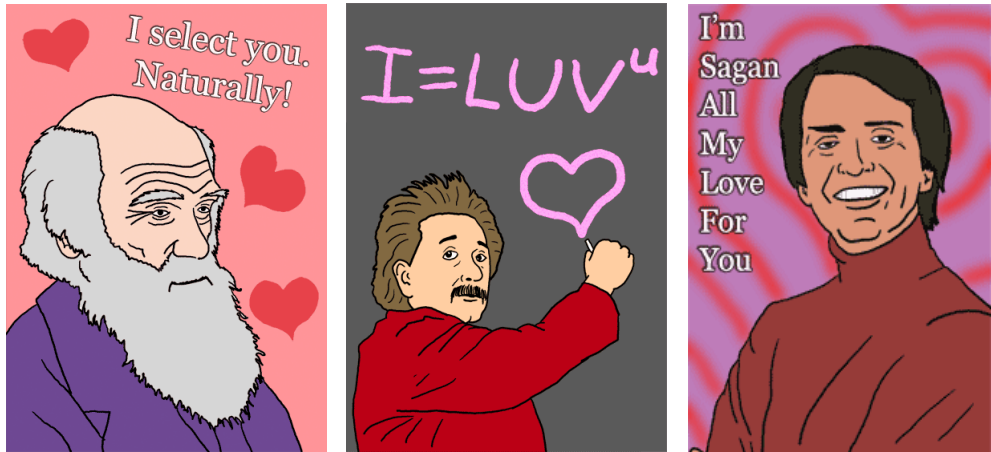
Primary hues from a light pinkish violet to a deep purple. The Greeks believed

amethyst gems could prevent intoxication, while medieval European soldiers wore² amethyst amulets as protection in battle), It is a symbol of heavenly understanding, and of the pioneer in thought and action on the philosophical, religious, spiritual, and material planes.

Brotherly love is the constellation for February

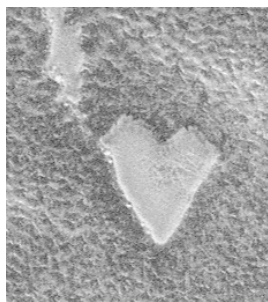
This constellation Gemini dates from ancient times, representing a pair of twins, the sons of Leda, holding hands. We know these twins as Castor and Pollux, members of the Argonaut's crew. They are half brothers since their fathers were King Tyndareus of Sparta and Zeus, respectively. The twins were the patron saints of mariners, appearing in the ship's rigging as St. Elmo's Fire.

Samples of Cool cards for the scientist type from [Ironic Sans](#)



Island Eyepiece and Science Emporium is Outta This World!

With an ever changing inventory of goodies, its always worth the trip to Island Eyepiece and Science Emporium in Mill Bay for even more great ideas to woo your sweetheart or to just please yourself. PH# 250-743-6633



It is always a pleasure to thank this month's contributors: Moe Raven and Bryon Thompson for all their input and enthusiasm.

Happy Valentine's Day from the Red Planet! The Mars Global Surveyor (MGS) Mars Orbiter Camera (MOC) captured this unique view of a bright, heart-shaped mesa in the south polar region on November 26, 1999.

Freda Eckstein

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

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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 February social will be held at **7:30 on WEDNESDAY February 25th**

Our feature is "**Toward Nature's Heart of Darkness: New Technologies for Precision Astrophysics and Cosmology**" presented by **Dr. Justin Albert**.

Dr. Albert is the Assistant Professor of Physics in the Department of Physics and

Astronomy at UVIC. His Research interests are: Fundamental physics; new technologies and techniques for answering mankind's ultimate questions about nature, and the basic principles that govern its behavior, from the very smallest to the very largest scales.

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Hope to see you all there.

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Highlights - January

By Freda Eckstein

Our January feature "A Glimpse into a Solar Eclipse" by Michael Webb was very entertaining and informative. The "live footage" of the solar eclipse was my favourite, especially the "whooping and cheering" by Donna ☺. The event is spectacular in itself but listening to Michael and Donna's travelling adventures with "kamikaze Ken", the required stops to "Sing a Song", camel riding, boats and the footwear requirements for desert trekking was fun. In July they are off to another adventure to see a solar eclipse again in China. Hopefully we can have them back again to tell us their experiences. Thank you Michael and Donna for also donating your Honorarium for further club activities. We appreciate it.

Join us for our next social on Wednesday, Feb 25th/09. For more information about upcoming Socials go to [Starfinders Socials](#)

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Upcoming Events

January 1 to April 30, Astronomy open house from 8:00pm – 10:00pm

5th floor of the Bob Wright Centre for Ocean, Earth and Atmosphere — Victoria, BC. Open house with the University of Victoria's telescopes - come see the stars and planets every clear Wednesday evening. Admission: Free

February 1 to 28, From Earth to the Universe

Location: The Bay Centre and the Victoria Airport. Exhibition of space photographs created by international and Canadian astronomers, both professional and amateur, works by visual artists who have been inspired by the cosmos and artwork by Greater Victoria school children. Admission: Free

February 8th – Mission to Mars – Dr Alain Berinstain at Bob Wright Centre (SCI) B150, UVIC from 2:30 – 4:30pm Admission: Free

Director of Planetary Exploration and Space Astronomy of the Space Science Branch. He is responsible for such projects as the Canadian involvement in the Phoenix Mars mission, the Canadian involvement in the James Webb Space Telescope, and participates in the effort for putting together plans for Canada's role in the exploration of the Solar System. More info visit the link:

http://www.phys.uvic.ca/office/Colloquium/Berinstain_02_08_09.pdf

February 25-27 Music of the Spheres University Centre — Victoria, BC

Did you know that it was once believed that each planet had its own harmony? Join Tania Miller as she brings together the exciting discoveries of astronomy and music as we go on a journey to explore the Music of the Spheres! This concert will teach the audience about Galileo and the exciting world of astronomy while exploring the wonderful music that was inspired by the Universe. These concerts are booked through the school system, but offer opportunities for interactions with amateur astronomers * Victoria, University Centre: Feb. 25, 11 am and 1 pm Grades 4-7 Feb. 26, 11 am and 1 pm Grades 4-7 Feb. 27, 9:30 and 11 am Grades K-3.

NASA Launches:

Date: Feb. 4

Mission: NOAA-N Prime

Launch Vehicle: United Launch Alliance Delta II

Launch Site: Vandenberg AFB - Launch Pad SLC-2

Location: Vandenberg AFB

NOAA-N Prime is the latest polar-orbiting satellite developed by NASA/Goddard Spaceflight Center for the National Oceanic and Atmospheric Administration (NOAA). NOAA uses two satellites, a morning and afternoon satellite, to ensure every part of the Earth is observed at least twice every 12 hours. NOAA-N will collect information about Earth's atmosphere and environment to improve weather prediction and climate research across the globe.

Date: Feb. 12 +

Mission: STS-119

Launch Vehicle: Space Shuttle Discovery

Launch Site: Kennedy Space Center - Launch Pad 39A

Location: Kennedy Space Center

Description: Space shuttle Discovery launching on assembly flight 15A, will deliver the fourth starboard truss segment to the International Space Station

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This Month In History

Courtesy of: Nick Greene, About.com

Feb 1: 2003 - Shortly after 9:00AM EST, the [Space Shuttle Columbia](#) (STS-107) disintegrated in the skies above Texas, killing all crew members aboard.

Feb 4: 1906 - Clyde Tombaugh, discoverer of Pluto, born.

Feb 5: 1971 - Apollo 14 landed on the moon.

Feb 14: 1950 - Karl Guthe Jansky, inventor of radio astronomy, died.

Feb 19: 1473 - [Nicolaus Copernicus](#) born in Torun, Poland.

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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".

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

NASA Television is now on YouTube. View Mission updates, news briefings, history, 'This Week @NASA' and more at <http://ca.youtube.com/NASATelevision>.

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Featured Articles

Astronomers Crack Lunar Mystery – January 14/09 credit MIT, Cambridge, Maryland

The collection of rocks that the Apollo astronauts brought back from the Moon carried with it a riddle that has puzzled scientists since the early 1970s: What produced the magnetization found in many of those rocks?

Researchers at Massachusetts Institute of Technology (MIT) carried out the most detailed analysis of the oldest pristine rock from the Apollo collection and have solved the longstanding puzzle. Magnetic traces recorded in the rock provide strong evidence that 4.2 billion years ago the Moon had a liquid core with a dynamo, like Earth's core today, that produced a strong magnetic field.

The Moon rock that produced the new evidence was long known to be a very special one. It is the oldest of all the Moon rocks that have not been subjected to major shocks from later impacts - something that tends to erase all evidence of earlier magnetic fields. In fact, it's older than any known rocks from Mars or even from Earth. "Many people think that it's the most interesting lunar rock," said Ben

Articles

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6. 'Star Trek' Duo Destined For Space

Weiss, the Victor P. Starr assistant professor of planetary sciences in MIT's Department of Earth, Atmospheric and Planetary Sciences. The rock was collected during the last lunar landing mission, Apollo 17, by Harrison "Jack" Schmidt, the only geologist to walk on the Moon. "It is one of the oldest and most pristine samples known," said graduate student Ian Garrick-Bethell. "If that wasn't enough, it is also perhaps the most beautiful lunar rock, displaying a mixture of bright green and milky white crystals."

The team studied faint magnetic traces in a small sample of the rock in great detail. Using a commercial rock magnetometer that was specially fitted with an automated robotic system to take many readings "allowed us to make an order of magnitude more measurements than previous studies of lunar samples," Garrick-Bethell said. "This permitted us to study the magnetization of the rock in much greater detail than previously possible." And the data enabled them to rule out the other possible sources of the magnetic traces, such as magnetic fields briefly generated by huge impacts on the Moon. Those magnetic fields are short lived, ranging from just seconds for small impacts up to one day for the most massive strikes. But the evidence written in the lunar rock showed it must have remained in a magnetic environment for a long period of time - millions of years - and thus the field had to have come from a long-lasting magnetic dynamo.

That's not a new idea, but it has been "one of the most controversial issues in lunar science," Weiss said. Until the Apollo missions, many prominent scientists were convinced that the Moon was born cold and stayed cold, never melting enough to form a liquid core. Apollo proved that there had been massive flows of lava on the Moon's surface, but the idea that it has, or ever had, a molten core remained controversial. "People have been vociferously debating this for 30 years," Weiss said.

The magnetic field necessary to have magnetized this rock would have been about one-fiftieth as strong as Earth's is today. Weiss said, "This is consistent with dynamo theory," and also fits in with the prevailing theory that the Moon was born when a Mars-sized body crashed into Earth and blasted much of its crust into space, where it clumped together to form the Moon. The new finding underscores how much we still don't know about our nearest neighbor in space, which will soon be visited by humans once again under current NASA plans. "While humans have visited the Moon six times, we have really only scratched the surface when it comes to our understanding of this world," said Garrick-Bethell.

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Giant Rockets Could Revolutionize Astronomy – January 14/09
credit Science@NASA

In the game of astronomy, size matters. To get crisp, clear images of things billions of light years away, a telescope needs to be big. "The bigger the better," says astronomer Harley Thronson, who leads advanced concept studies in astronomy at the Goddard Space Flight Center. And he thinks "NASA's new Ares V rocket is going to completely change the rules of the game."

Ares V is the rocket that will deliver NASA's next manned lunar lander to the moon as well as all the cargo needed for a lunar base. Its roomy shroud could hold about eight school buses, and the rocket will pack enough power to boost almost 180,000 kg (396,000 lbs -- about 16 or 17 school buses) into low Earth orbit. Ares V can haul six times more mass and three times the volume the space shuttle can. "Imagine the kind of telescope a rocket like that could launch," says Thronson. "It could revolutionize astronomy."



Right: The roomy shroud of the Ares V could hold

Optical engineer Phil Stahl of the Marshall Space Flight Center offers this example: "Ares V could carry an 8-meter diameter monolithic telescope, something that we already have the technology to build. The risk would be relatively low, and there are some big cost advantages in not having to cram a large telescope into a smaller launcher."

For comparison, he points out that Hubble is only 2.4 meters wide. An 8-meter monolithic telescope would see things more than three times as sharply as Hubble can. More importantly, in the same amount of observing time, the larger mirror would see objects that are about 11 times fainter than Hubble sees because the 8-meter telescope has 11 times the light collecting area. But Ares V can go yet bigger. It could transport a huge segmented telescope – one with several separate mirror panels that are folded up for transport like the James Webb Space Telescope--but three times the size!

The Space Telescope Science Institute's Marc Postman has been planning a 16-meter segmented optical/ultraviolet telescope called ATLAST, short for Advanced Technology Large-Aperture Space Telescope. The science from an aperture its size would be spectacular. "ATLAST would be nearly 2000 times more sensitive than the Hubble Telescope and would provide images about seven times sharper than either Hubble or James Webb," says Postman. "It could help us find the long sought answer to a very compelling question -- 'Is there life elsewhere in the galaxy?'"

ATLAST's superior sensitivity would allow astronomers to hugely increase their sample size of stars for observation. Then, discovery of planets hospitable to life could be just around the corner!

"With our space-based telescope, we could obtain the spectrum of Earth-mass planets orbiting a huge number of nearby [60 - 70 light years from Earth] stars," says Postman. "We could detect any oxygen and water in the planets' spectral signatures. ATLAST could also precisely determine the birth dates of stars in nearby galaxies, giving us an accurate description of how galaxies assemble their stars."



Left: Even the smallest space telescope envisioned for launch onboard the Ares V would dwarf Hubble. Image credit: NASA.

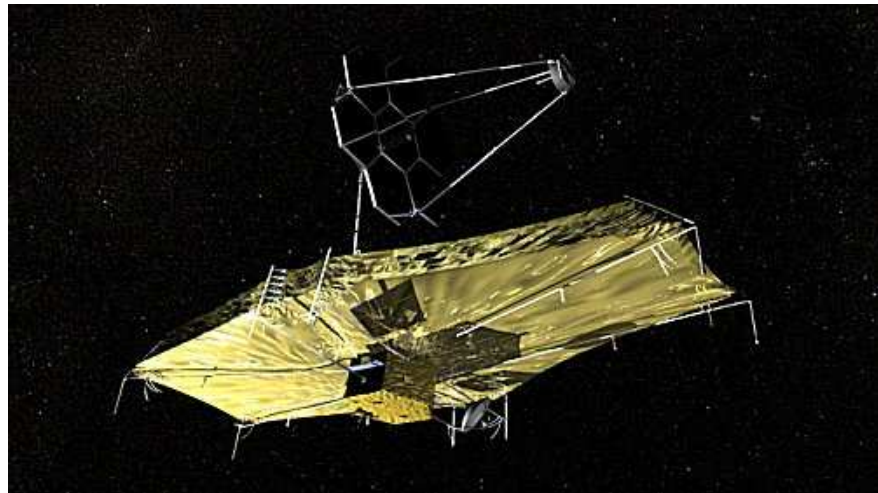
This telescope could also probe the link between galaxies and black holes.

Scientists know that almost all modern galaxies have supermassive black holes in their centers. "There must be a fundamental relationship between the formation of supermassive black holes and the formation of galaxies," explains Postman, "but we don't understand the nature of that relationship. Do black holes form first and act as seeds for the growth of galaxies around them? Or do galaxies form first and serve as incubators for supermassive black holes? A large UV/optical telescope could answer this question: If our telescope finds ancient galaxies that do not have supermassive black holes in their centers, it will mean galaxies can exist without them."

Dan Lester of the University of Texas at Austin envisions another 16-meter telescope, this one for detecting far-infrared wavelengths. "The far-infrared telescope is quite different from, and quite complementary to, the optical telescopes of Stahl and Postman," says Lester. "In the far-infrared part of the spectrum, we generally aren't looking at starlight itself, but at the glow of warm dust and gas that surrounds the stars. In the very early stages of star formation, the proto-star is surrounded by layers of dust that visible light can't penetrate. Our telescope will allow us to see down into the innards of these giant dense clouds

that are forming stars deep inside."

Observations in the far-infrared are especially challenging. These long wavelengths are hundreds of times larger than visible light, so it's hard to get a clear picture. "A very big telescope is necessary for good clarity at IR wavelengths," notes Lester.



Above: An artist's concept of the Single Aperture Far-Infrared Telescope (SAFIR) that could be launched aboard the Ares V.

Like the telescopes of Stahl and Postman, Lester's Single Aperture Far-Infrared Telescope ('SAFIR' for short), comes in two flavors for the Ares V: an 8-meter monolithic version and a 16-meter segmented version. Lester realized that, with an Ares V, he could launch an 8-meter telescope that didn't need complicated folding and unfolding. "But on the other hand, if we don't mind adding the complexity and cost of folding and still use an Ares V, we could launch a really mammoth telescope," says Lester.

In addition to all the above telescopes, Ares V could boost an 8-meter-class X-ray telescope into space. NASA's highly-successful Chandra X-ray Observatory has a 1 meter diameter mirror, so just imagine what an 8-meter Chandra might reveal!

Roger Brissenden of the Chandra X-ray Center is excited about the possibility of a future 8-meter-class X-ray telescope called Gen-X. "Gen-X would be an extraordinarily powerful X-ray observatory that could open up new frontiers in astrophysics," he says. "This telescope will observe the very first black holes, stars and galaxies, born just a few hundred million years after the Big Bang, and help us determine how these evolve with time. Right now, the study of the young universe is almost purely in the realm of theory, but with Gen-X's extreme sensitivity (more than 1000 times that of Chandra) these early objects would be revealed."

Indeed, Ares V flings shutters open wide on our view of the cosmos. It shakes off the shackles of mass and volume constraints from science missions and sweeps us into deep space to view "...a hundred things/ You have not dreamed of." "We could get incredible astronomy from this big rocket," says Thronson, a professional dreamer. "I can't wait."

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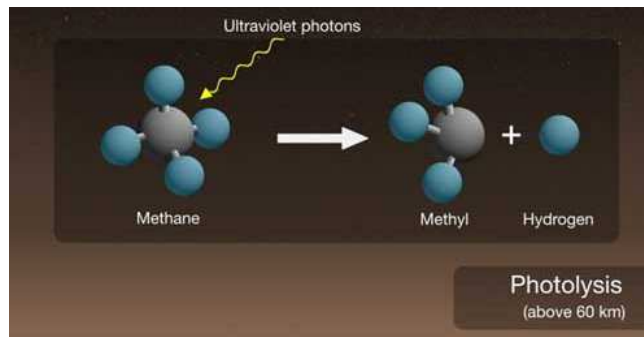
The Red Planet is Not a Dead Planet – January 15/09 Credit Science@NASA

Mars today is a world of cold and lonely deserts, apparently without life of any kind, at least on the surface. Indeed it looks like Mars has been cold and dry for billions of years, with an atmosphere so thin, any liquid water on the surface quickly boils away while the sun's ultraviolet radiation scorches the ground. The situation sounds bleak, but research published today in Science Express reveals new hope for the Red Planet. The first definitive detection of methane in the

atmosphere of Mars indicates that Mars is still alive, in either a biologic or geologic sense, according to a team of NASA and university scientists.

"Methane is quickly destroyed in the Martian atmosphere in a variety of ways, so our discovery of substantial plumes of methane in the northern hemisphere of Mars in 2003 indicates some ongoing process is releasing the gas," says lead author Michael Mumma of NASA's Goddard Space Flight Center. "At northern mid-summer, methane is released at a rate comparable to that of the massive hydrocarbon seep at Coal Oil Point in Santa Barbara, Calif." Methane -- four atoms of hydrogen bound to a carbon atom -- is the main component of natural gas on Earth. It is of interest to astrobiologists because much of Earth's methane come from living organisms digesting their nutrients. However, life is not required to produce the gas. Other purely geological processes, like oxidation of iron, also release methane. "Right now, we don't have enough information to tell if biology or geology -- or both -- is producing the methane on Mars," said Mumma. "But it does tell us that the planet is still alive, at least in a geologic sense. It's as if Mars is challenging us, saying, hey, find out what this means."

If microscopic Martian life is producing the methane, it likely resides far below the surface, where it's still warm enough for liquid water to exist. Liquid water, as well as energy sources and a supply of carbon, are necessary for all known forms of life. "On Earth, microorganisms thrive 2 to 3 kilometers (about 1.2 to 1.9 miles) beneath the Witwatersrand basin of South Africa, where natural radioactivity splits water molecules into molecular hydrogen (H₂) and oxygen (O). The organisms use the hydrogen for energy. It might be possible for similar organisms to survive for billions of years below the permafrost layer on Mars, where water is liquid, radiation supplies energy, and carbon dioxide provides carbon," says Mumma. "Gases, like methane, accumulated in such underground zones might be released into the atmosphere if pores or fissures open during the warm seasons, connecting the deep zones to the atmosphere at crater walls or canyons," he says. "Microbes that produced methane from hydrogen and carbon dioxide were one of the earliest forms of life on Earth," notes Carl Pilcher, Director of the NASA Astrobiology Institute which partially supported the research. "If life ever existed on Mars, it's reasonable to think that its metabolism might have involved making methane from Martian atmospheric carbon dioxide."



Left: This graphic shows one way methane is destroyed in the Martian atmosphere: the molecules are rapidly broken apart by solar ultraviolet radiation. Because methane doesn't last long in the martian environment, any

methane found there must be recently produced.

However, it is possible a geologic process produced the Martian methane, either now or eons ago. On Earth, the conversion of iron oxide (rust) into the serpentine group of minerals creates methane, and on Mars this process could proceed using water, carbon dioxide, and the planet's internal heat. Another possibility is vulcanism: Although there is no evidence of currently active Martian volcanoes, ancient methane trapped in ice "cages" called clathrates might now be released.

The team found methane in the atmosphere of Mars by carefully observing the planet over several Mars years (and all Martian seasons) using spectrometers attached to telescopes at NASA's Infrared Telescope Facility, run by the University of Hawaii, and the W. M. Keck telescope, both at Mauna Kea, Hawaii. "We observed and mapped multiple plumes of methane on Mars, one of which released about 19,000 metric tons of methane," says Geronimo Villanueva of the Catholic University of America in Washington, D.C. Villanueva is stationed at

NASA Goddard and is co-author of the paper. "The plumes were emitted during the warmer seasons -- spring and summer -- perhaps because the permafrost blocking cracks and fissures vaporized, allowing methane to seep into the Martian air. Curiously, some plumes had water vapor while others did not," he says. To view the Methane plumes found in Mars' atmosphere during the northern summer season, view the link courtesy of: Trent Schindler/NASA http://www.nasa.gov/mov/303568main_mjmmma_vid_01.mov

According to the team, the plumes were seen over areas that show evidence of ancient ground ice or flowing water. For example, plumes appeared over northern hemisphere regions such as east of Arabia Terra, the Nili Fossae region, and the south-east quadrant of Syrtis Major, an ancient volcano 1,200 kilometers (about 745 miles) across.

It will take future missions, like NASA's Mars Science Laboratory, to discover the origin of the Martian methane. One way to tell if life is the source of the gas is by measuring isotope ratios. Isotopes are heavier versions of an element; for example, deuterium is a heavier version of hydrogen. In molecules that contain hydrogen, like water and methane, the rare deuterium occasionally replaces a hydrogen atom. Since life prefers to use the lighter isotopes, if the methane has less deuterium than the water released with it on Mars, it's a sign that life is producing the methane. Whatever future research reveals--biology or geology--one thing is already clear: Mars is not so dead, after all.

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NASA Sees The 'Dark Side' of The Sun- January 23/09 Credit Science@NASA

Today, NASA researchers announced an event that will transform our view of the Sun and, in the process, super-charge the field of solar physics for many years to come. "On February 6, 2011," says Chris St. Cyr of the Goddard Space Flight Center, "Super Bowl XLV will be played in Arlington, Texas."

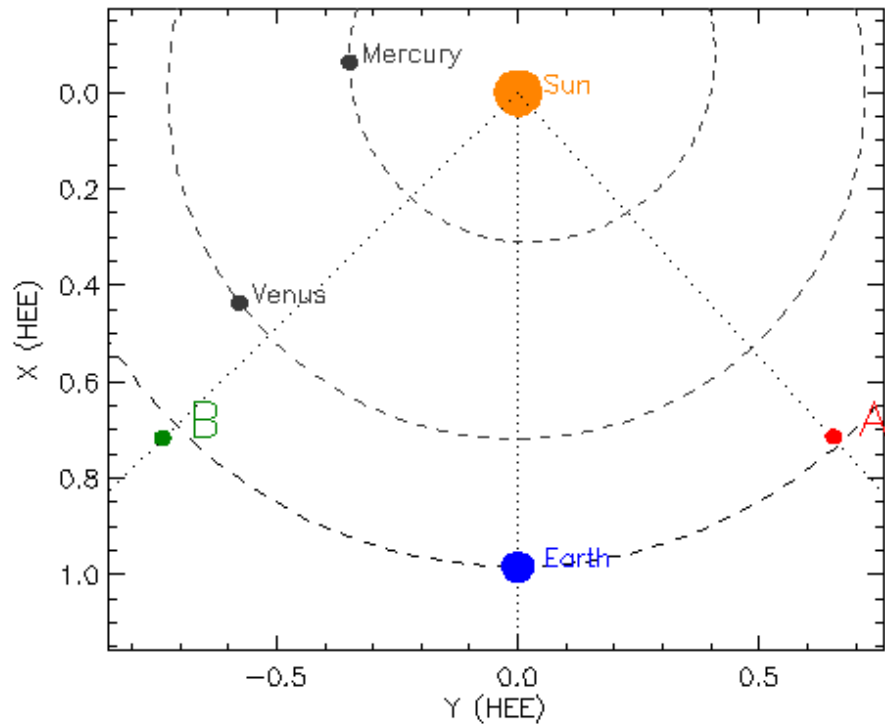
Wait ... that's not it. "And on the same day," he adds, "NASA's two STEREO spacecraft will be 180 degrees apart and will image the entire Sun for the first time in history."

STEREO's deployment on opposite sides of the Sun solves a problem that has vexed astronomers for centuries: At any given moment they can see only half of the stellar surface. The Sun spins on its axis once every 25 days, so over the course of a month the whole Sun does turn to face Earth, but a month is not nearly fast enough to keep track of events. Sunspots can materialize, explode, and regroup in a matter of days; coronal holes open and close; magnetic filaments stretch tight and—snap!—they explode, hurling clouds of hot gas into the solar system. Fully half of this action is hidden from view, a fact which places space weather forecasters in an awkward position. How can you anticipate storms when you can't see them coming? Likewise researchers cannot track the long-term evolution of sunspots or the dynamics of magnetic filaments because they keep ducking over the horizon at inconvenient times. STEREO's global view will put an end to these difficulties.

The global view is still two years away. Already, however, the two spacecraft are beaming back over-the-horizon images that have researchers and forecasters glued to their monitors. "This is a perspective we've never had before," says STEREO mission scientist Lika Guhathakurta of NASA headquarters. "We're now monitoring more than 270 degrees of solar longitude—that's 3/4ths of the star."

"After all these years," she laughs, "we're finally getting to see the dark side of the Sun." (Editor's note: The Sun has no dark side. That was a solar physics joke.)

STEREO's journey to the "dark side" began on Oct. 25, 2006, when the twin probes left Earth together onboard a Delta II rocket. High above the atmosphere, they separated and headed for the Moon. What happened next was a first in space navigation. The Moon acted as a gravitational slingshot, flinging the two probes in opposite directions—STEREO-A ahead of Earth and STEREO-B behind. They've



Above: The current positions of the STEREO Ahead (red) and Behind (green) spacecraft relative to the Sun (orange) and Earth (blue). The dotted lines show the angular displacement from the Earth. Because of the way the Sun spins (counterclockwise in the diagram above), STEREO-B gets a sneak preview of sunspots and coronal holes before they turn to face Earth—a boon for forecasters. "I know forecasters at NOAA's Space Weather Prediction Center monitor STEREO-B very closely," says St Cyr. "It lets them know what's coming."

At the moment, STEREO-B enjoys a 3-day look-ahead advantage over Earth-based observatories. This has allowed researchers to predict geomagnetic storms as much as 72 hours earlier than ever before. On several occasions in late 2008, STEREO-B spotted a coronal hole spewing solar wind before any other spacecraft did. When the solar wind hit Earth, STEREO-B's long-range forecast was validated by auroras like these:



Left: Photographer Brian Whittaker took this picture from the window of an airplane flying over Greenland on Nov. 9, 2008. The auroras were sparked by a solar wind impact anticipated by STEREO-B. Credit: Spaceweather.com.

St. Cyr notes that experienced ham radio operators can participate in this historic mission by helping NASA capture STEREO's images. The busy Deep Space Network downloads data from STEREO only three hours a day. That's plenty of time to capture all of the previous day's data, but NASA would like to monitor the transmissions around the clock.

"So we're putting together a 'mini-Deep Space Network' to stay in constant contact with STEREO," says Bill Thompson, director of the STEREO Science Center at Goddard. The two spacecraft beam their data back to Earth via an X-band radio beacon. Anyone with a 10-meter dish antenna and a suitable receiver can pick up the signals. The data rate is low, 500 bits per second, and it takes 3 to 5

minutes to download a complete image. So far, the mini-Network includes stations in the United Kingdom, France and Japan—and Thompson is looking for more: "NASA encourages people with X-band antennas to contact the STEREO team. We would gladly work with them and figure out how they can join our network." The two STEREO spacecraft rank among most sophisticated solar observatories launched by NASA to date. They are equipped with sensors that measure the speed, direction and composition of the solar wind; receivers that pick up radio emissions from explosions and shock waves in the sun's atmosphere; telescopes that image the solar surface and all the tempests that rage there; and coronagraphs to monitor events in the sun's outer atmosphere.

"So, really," says Guhathakurta, "we're not only seeing the sun's dark side, we're feeling, tasting and listening to it as well." Super Bowl Sunday may never be the same...

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NASA Invites Public To Choose Hubble's Next Discovery—

January 28/09 Credit Provided by NASA, Washington, DC.

NASA is giving everyone the opportunity to use the world's most celebrated telescope to explore the heavens and boldly look where the Hubble Space Telescope has never looked before.

NASA is inviting the public to vote for one of six astronomical objects for Hubble to observe in honor of the International Year of Astronomy. The options, which Hubble has not previously photographed, range from far-flung galaxies to dying stars. Votes can be cast until March 1, 2009. Hubble's camera will make a high-resolution image revealing new details about the object that receives the most votes. The image will be released during the International Year of Astronomy's "100 Hours of Astronomy" from April 2-5, 2009.

Space enthusiasts can cast their vote at: <http://YouDecide.Hubblesite.org>

Everyone who votes also will be entered into a random drawing to receive one of 100 copies of the Hubble photograph made of the winning celestial body.

NASA also invites teachers and students to participate in an accompanying Hubble Space Telescope classroom collage activity that integrates art, science, and language arts. Students in participating classes will select their favorite Hubble images and assemble them in a collage. Students in each class also will choose their favorite object from the image-voting contest and write essays about why they made their selections.

The Hubble Space Telescope, launched in 1990, was designed so that astronauts can repair it in space. The next servicing mission to the telescope is targeted to launch on space shuttle Atlantis May 12, 2009. Mission objectives include extending Hubble's operational life by 5 years, repairing its out-of-commission instruments, and enhancing its scientific power. To do so, astronauts will replace gyroscopes and batteries on the telescope, repair the Space Telescope Imaging Spectrograph and the Advanced Camera for Surveys, and install two new instruments - the Wide Field Camera 3 and the Cosmic Origins Spectrograph.

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'Star Trek' Duo Destined For Space – January 26/09 Credit Associated Press

LOS ANGELES - The creator of "Star Trek" and his wife will spend eternity together in space.

Celestis Inc., a company that specializes in "memorial spaceflights," said Monday that it will ship the remains of Gene Roddenberry and Majel Barrett-Roddenberry into space next year.

The couple's cremated remains will be sealed into specially made capsules designed to withstand the rigors of space travel. A rocket-launched spacecraft

will carry the capsules, along with digitized tributes from fans. The Roddenberrys' 12 remains — and the spacecraft — will travel ever deeper into space and will not return to earth, company spokeswoman Susan Schonfeld said. After Gene Roddenberry died in 1991, his wife commissioned Celestis to launch a part of his remains into space in 1997. She died Dec. 18, 2008.

Barrett-Roddenberry played Number One and Nurse Christine Chapel in the original "Star Trek" series, and played Deanna Troi's mother on "Star Trek: The Next Generation." And prior to her death, she was the voice of the Enterprise in the forthcoming "Star Trek" movie, due out in May.

(Editor note) Note of interest *the same company also launched the cremated remains of actor James Doohan, who portrayed the engineer Scotty on "Star Trek," and of NASA astronaut Gordon Cooper on April 30, 2007.*

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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.

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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 Robillard](#) 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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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.

SCIENCE FICTION – SCIENCE FACT

Hey do you ever wonder if what you see on TV Sci-Fi shows is real? Whether it's Star Trek's USS Enterprise, or the iconic space station from 2001: A Space Odyssey, science fiction has always provided inspiration and ideas for the scientists and engineers that design and build real spacecraft.

'Science fiction – science fact' is part of a series of [short video lessons](#) called Space-in-Bytes developed by ESA's Directorate of Human Spaceflight. Aimed at upper secondary school students and their teachers, the Space-in-Bytes series presents 'bite-sized' scientific information, offering a starting point for further individual or classroom investigation.

The video is accompanied by lesson notes which include scientific explanations of some of the concepts illustrated in the video. The lesson is intended to provide teachers, and their students, with more information about the topics covered in the video, and to suggest curriculum-relevant exercises which can be carried out in class.

'Science fiction – science fact', and the previous Space-in-Bytes videos, are available for download from ESA.

Visit: [Science Fiction – Science Fact](#) and test your knowledge.

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RASC News

Royal Astronomical Society of Canada, Victoria Centre <http://victoria.rasc.ca>

Meetings

Meetings are held on the second Wednesday of each month except July and August downstairs in the Elliot Bldg at U of Vic.

Astronomy Café

The Astronomy Café Meets on Monday evenings at Sir James Douglas School on Fairfield Road.

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The Sky This Month

By Bryon Thompson

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

February opens with Venus high in the Southwest reaching a spotlight brightness of magnitude -4.8. Compare its brilliance to the brightest star in the sky, Sirius, to see if you can spot the difference. Sirius is a full twenty times dimmer than Venus. Venus' angular distance from the Sun remains at roughly 40° for most of this month so it will be high in the sky throughout February. Even though its phase (crescent shape) is diminishing, its brightness does not. This is partially due to its closing distance to the Earth. The two sister planets reach their closest approach on **February 28th**. This will cause Venus' apparent disc to grow from 30" to 44" and hence increase its brightness.

As Venus sets 3 hours after the Sun, Saturn can be found rising in the East in Leo. Although the Earth will not pass through the ring plane until August, an event that will sadly take place when Saturn is on the far side of the Sun, the nearly edge on rings allow us an excellent view of Saturn's disc. An opportunity to witness a rare event will present itself this month due to the almost full view of Saturn's disc. Saturn's largest moon Titan (the second largest moon in the solar system) orbits its gas giant once every 16 Earth days. Without the glare produced from the rings that would normally wash out this event, you should be able to spot Titan's shadow transit the face of Saturn. This rare sight is short lived but if you are graced with a clear sky on the **24th of February** at 3:00am PST; through a telescope, you should be able to see Titan's shadow cross the Northern half of Saturn's disc.

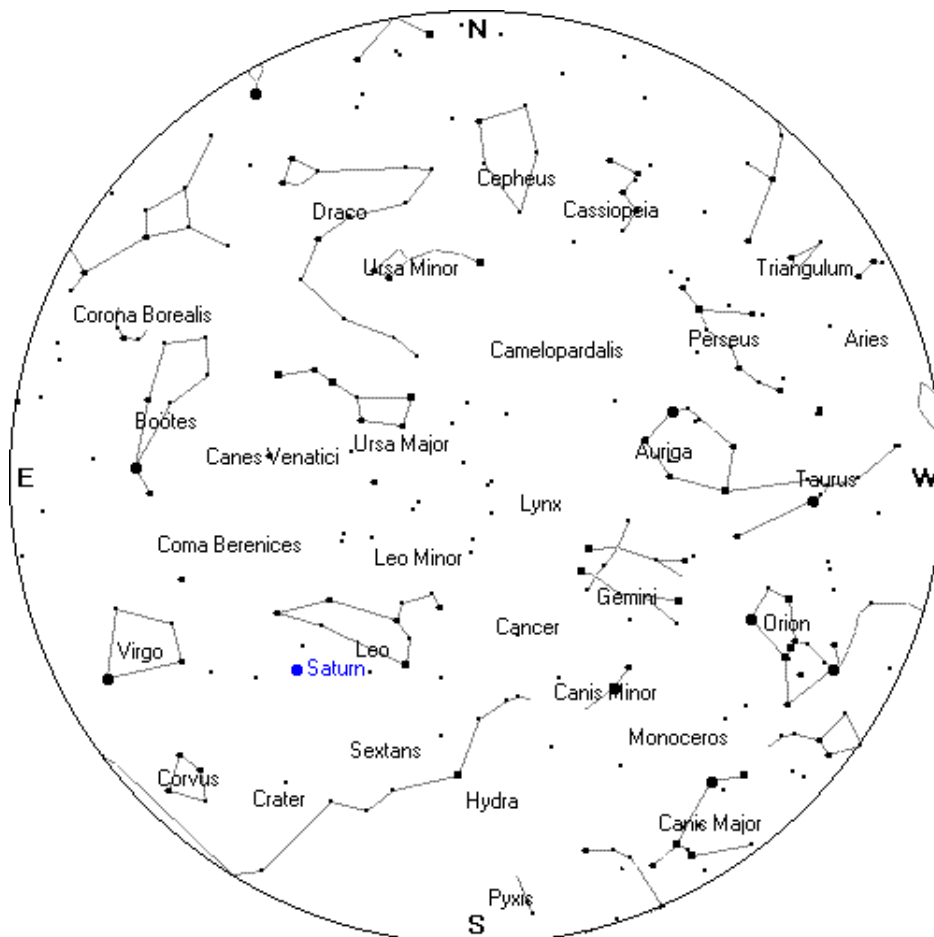
A couple of unlikely targets for us mountain-filled coastal viewers happens ½ hour before sunrise in the middle of the month. Mercury and Jupiter are low pre-dawn objects with Mercury at only 8° above the horizon and Jupiter at a mere 3°. If you are lucky enough to have an unobstructed view of the Eastern horizon have a look for this trio on **February 22nd**: Mercury, Jupiter and one moon widths below Jupiter, faint little Mars. The waning crescent Moon tops off the other three this morning and will make a great photo op. If you do happen to grab a shot of the four of them together please send it in and we will post it in next month's newsletter.

February does not have any major meteor showers to speak of but there is a chance of seeing some sporadics. Sporadic meteors are wanderers that are not part of other regular showers; still they can occur at about the rate of 7 per hour. Once in awhile if they fall with a brightness that exceeds a magnitude of -4 they are officially classed as fireballs.

Here's hoping your February is filled with clear dark skies, shadow transits and fireballs of fun, all in all a great start to the International Year of Astronomy. Remember Astronomy is looking up

February 2	03:13pmPST	First Quarter Moon
February 9	06:49amPST	Full Moon
February 16	01:37pmPST	Last quarter Moon
February 19	07:00amPST	Venus reaches greatest brilliance mag. -4.8
February 22	½ hr before sunrise	Mars, Jupiter, Mercury and crescent Moon align
February 24	03:00amPST	Titan's shadow transits Saturn's Northern disc
February 24	05:45pmPST	New Moon

Sky Chart—Here's your mid-February 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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