



Clear Skies

Volume 15, Issue 9

February 2010

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. [KIDS KORNER](#)
10. [THE SKY THIS MONTH](#)

Quick Links

[ABOUT THE CLUB](#)

[NEWSLETTER ARCHIVES](#)

[MONTHLY SOCIALS](#)

[BECOME A MEMBER](#)

1. Greetings!

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

While other folks in most parts of Canada are still shovelling out or bundling up to go outside. Here on the Island we have had the most mildest winter (so far) that I can remember. Not as many starry nights, as I would hope, but I guess we can't have everything. I still can't believe we are into February and what an interesting month it proves to be.

For one thing, it offers up two of the strangest rituals. From waiting for a "rat like rodent" to tell us what the next six weeks will bring (groundhog day) to St. Valentine. The stories which, at best are murky, do emphasize his appeal as a sympathetic, heroic, and, romantic figure from the middle ages. So to commemorate the anniversary of Valentine's death or burial, we give and receive tokens of affection or valentines to tell that special someone how much we care. Ok maybe it's me; but I don't see the correlation.

Also we have this month, three well known contributors to Astronomy who were born in February and who share the spotlight this month. Nicolas Copernicus (February 19 1473), Galileo Galilei (February 15, 1564) and Clyde Tombaugh (February 4, 1906) discoverer of the planet (or dwarf-Planet) Pluto. February is also "Black History Month", check "This Month in History" section to view the achievements of African-Americans in the fields of astronomy and space.

And of course, let's not forget the winter Olympics. Interestingly enough, but even more so since we have no snow. Thank goodness I wasn't the Project Manager for this one! But to do my part, since I'm still having a bit of trouble BELIVING, be sure to check out the article on "An Olympic Test of Your Vision" featured this month.

Thanks to Melissa Graham and Alex Parker who did the double feature at last month's social. Read Nancy's Social Highlights for more details. Plus a thanks to Rod and Mike who came to see what our club was about. Hope to see you again.

Many thanks to this month's contributors Moe Raven, Nancy Kirshfelt and Bryon Thompson.

By Freda Eckstein

"Astronomers, like burglars and jazz musicians, operate best at night"- Miles Kington [back](#)

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 February 24th**
Featuring: "Amateur Contributions to Astronomical Science: A brief look at some stellar findings" by Christina Martens

Christina has been attending star parties for over 10 years and her claim to fame is setting off a car alarm, complete with flashing lights, during one of them. Currently she and her partner, Gerry, are on a quest to survey some of the northern sky for Exo-planets and maybe join the list of non-professional astronomers that have made real contributions to our understanding of the Universe.

[back](#)

Highlights – Jan 24/10

By Nancy Kirshfelt

At our January meeting there was a good turnout of members as well as a few new people...and of course lots of cookies, tea, coffee and good conversation.

Our amazing guest speakers were Melissa Graham and Alex Parker.

Just to re-cap her bio, Melissa is inspired by the writings of Dr. Carl Sagan, and obtained a B.Sc.H. in Physics & Astrophysics from Queens University in Kingston ON. On September 2004 Melissa became a graduate student at the University of Victoria where she studies the rates of type Ia supernovae in exotic elliptical galaxies with Dr. Chris Pritchet. She shared information about her thesis which focuses on identifying and quantifying correlations between the rates and properties of type Ia supernovae, and their host galaxy characteristics such as mass, star formation rate, radio power, infrared luminosity, and the galaxy number density in its local environment. She has a great website at <http://www.astro.uvic.ca/~melissa/Site/Welcome.html> with lots of info about her research and education.

Alex Parker spoke next. His bio is as follows: after completing his Bachelors in Astronomy and Physics at the University of Washington, he is now attending his 3rd year in Astronomy as a graduate student at the University of Victoria with Dr. JJ Kavelaars. He spoke on his research interests which include the formation and evolution of planetary systems. He studies asteroid and Kuiper-Belt Object dynamics and surface processes as well as detection of extrasolar planetary systems and protoplanetary disks, and planetary geology.

Together, Alex and Melissa collaborate on the Plaskett Spectroscopic Supernova Survey at the Dominion Astrophysical Observatory. This survey provides rapid follow-up and classification of newly discovered supernovae in the nearby Universe. Their main goals are to spectroscopically classify new supernovae and transient objects and to build a database of supernova spectra. The PSSS has been awarded on average two nights per week on the 1.8-meter Plaskett Telescope since it began in July of 2007.

They are both passionate and enthusiastic speakers who kept us all spell-bound for a few hours. Thank you to both of them for an exciting and informative evening.

[back](#)

3. 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.

NASA Launches credit NASA.Com:

Date: Feb. 7 +

Mission: STS-130

Launch Vehicle: Space Shuttle Endeavour

Launch Site: Kennedy Space Center - Launch Pad 39A

Launch Time: 4:39 a.m. EST

Description: Space shuttle Endeavour will deliver the final connecting node, Tranquility Node 3, and the Cupola, a robotic control station with six windows around its sides and another in the center that provides a 360-degree view around the International Space Station.

Date: Feb. 9

Mission: Solar Dynamics Observatory (SDO)

Launch Vehicle: United Launch Alliance Atlas V

Launch Site: Cape Canaveral Air Force Station - Launch Complex 41

Launch Time: 10:30 – 11:30 a.m. EST

Description: The first Space Weather Research Network mission in the Living With a Star, or LWS Program of NASA

[back](#)

4. This Month In History

Courtesy of: Nick Greene, About.com

Black History Month

Black History Month began as "Negro History Week" first celebrated in 1926. Later evolving into "Black History Month," it was the brainchild of Dr. Carter Woodson. Until that time, very little emphasis was placed on the study of African-American history. Disturbed by the lack of history of African-Americans, Dr. Woodson established the Assn. for the Study of Negro Life and History (now called the Assn. for the Study of Afro-American Life and History) in 1915. In 1916, he founded the widely respected Journal of Negro History. The second week of February was chosen for Negro History Week because of the birthdays of two men with great influence on the history of African-Americans, Frederick Douglass and Abraham Lincoln.

African-Americans have played a major role in the history of the United States of America and have much to be proud of. Here, we would like to celebrate just a few of the achievements of African-Americans in the fields of astronomy and space. This list is but a drop in the bucket and while it will continue to expand will never be complete.

- * Benjamin Baneker - 1st African-American Astronomer.
- * Doctor Arthur Bertram Cuthbert Walker II - Famed solar physicist and x-ray astronomer. Chaired Challenger disaster commission.
- * Doctor Harvey Washington Banks - 1st African-American to Receive a PhD. in Astronomy.
- * Doctor Neil deGrasse Tyson - Frederick Rose Director of the Hayden Planetarium in New York City.
- * Doctor Beth A. Brown - NASA Astrophysicist.
- * Robert Henry Lawrence - 1st African-American Astronaut.
- * Guion "Guy" Bluford - 1st African-American in Space.
- * Doctor Bernard Harris, Jr. - 1st African-American to walk in space.
- * Frederick Gregory - 1st African American to pilot a spacecraft, 1st African-American to command a spacecraft.
- * Doctor Mae Jemison - 1st African-American Woman in space.
- * Doctor Ronald E. McNair - Hero lost aboard Challenger.
- * Michael P. Anderson - Hero lost aboard Columbia.
- * Leland Melvin - Former pro football player with a winning game plan.

[back](#)

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".

Space Exploration Series -- Space, the final frontier, comes into focus for the armchair astronaut with

Hubble's Canvas and Cosmic Vistas. This set of four DVDs includes 12 half-hour programs that reveal the artistry and explains the science of outer space. These programs are hosted by noted astronomy columnist Ivan Semeniuk. [More info](#)

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](#)

6. Featured Articles

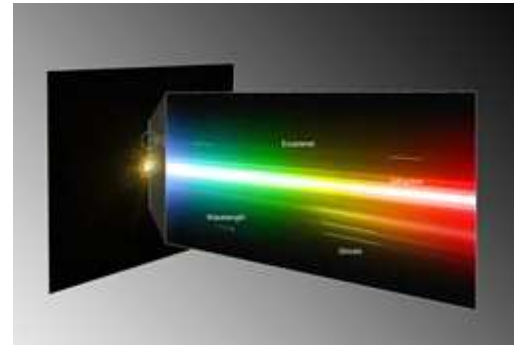
Articles

[RETURN TO CATEGORIES](#)

1. [VLT Captures First Direct Spectrum of an Exoplanet](#)
2. [An Olympic Test For Your Vision](#)
3. [NSF Selects NSO to Build Largest Solar Telescope](#)
4. [MSU Contributes to New Research on Star Formation](#)
5. [Live Long and Prosper, Xanthoria Elegans](#)
6. [Obama Budget Scraps NASA Moon Plan for '21st Century Space Program](#)

VLT Captures First Direct Spectrum of an Exoplanet— January 13/10
credit ESO, Garching, Germany

By studying a triple planetary system that resembles a scaled-up version of our own Sun's family of planets, astronomers have obtained the first direct spectrum — the chemical fingerprint — of a planet orbiting a distant star. The result is new insights into the planet's formation and composition and represents a milestone in the search for life elsewhere in the universe.



Right: Spectrum of the planet around HR 8799. ESO/M. Janson

"The spectrum of a planet provides key information about the chemical elements in the planet's atmosphere," said Markus Janson, lead author of the paper reporting the new findings. "With this information, we can better understand how the planet formed and, in the future, we might even be able to find tell-tale signs of the presence of life."

The researchers obtained the spectrum of a giant exoplanet that orbits the bright, young star HR 8799. The system is at about 130 light-years from Earth. The star has 1.5 times the mass of the Sun, and it hosts a planetary system that resembles a scaled-up model of our own solar system. Another team detected giant companion planets in 2008 with masses between seven and 10 times that of Jupiter. These planets are between 20 and 70 times as far from their host star as Earth is from the Sun; the system also features two belts of smaller objects, similar to our solar system's asteroid and Kuiper belts.

"Our target was the middle planet of the three, which is roughly 10 times more massive than Jupiter and has a temperature of about 800° Celsius," said team member Carolina Bergfors. "After more than 5 hours of exposure time, we were able to tease out the planet's spectrum from the host star's much brighter light."

This is the first time the spectrum of an exoplanet orbiting a normal, almost Sun-like star has been obtained directly. Previously, the only spectra to be obtained required a space telescope to watch an exoplanet pass directly behind its host star in an "exoplanetary eclipse," and then the spectrum could be extracted by comparing the light of the star before and after. However, this method can only be applied if the orientation of the exoplanet's orbit is exactly right, which is true for only a small fraction of all exoplanetary systems. The present spectrum, on the other hand, was obtained from the ground, using European Southern Observatory's (ESO) Very Large Telescope (VLT), in direct observations that do not depend on the orbit's orientation.

As the host star is several thousand times brighter than the planet, this is a remarkable achievement. "It's like trying to see what a candle is made of, by

observing it from a distance of about 1.2 miles (2 kilometers) when it's next to a blindingly bright 300 Watt lamp," said Janson.

The discovery was made possible by the infrared instrument NACO, mounted on the VLT, and relied heavily on the capabilities of the instrument's adaptive optics system. Even more precise images and spectra of giant exoplanets are expected both from the next generation Spectro-Polarimetric High-contrast Exoplanet REsearch (SPHERE) instrument, to be installed on the VLT in 2011, and from the European Extremely Large Telescope.

The newly collected data show the atmosphere enclosing the planet is still poorly understood. "The features observed in the spectrum are not compatible with current theoretical models," explained co-author Wolfgang Brandner. "We need to take into account a more detailed description of the atmospheric dust clouds, or accept that the atmosphere has a different chemical composition from that previously assumed."

The astronomers hope to soon get their hands on the fingerprints of the other two giant planets so they can compare, for the first time, the spectra of three planets belonging to the same system. "This will surely shed new light on the processes that lead to the formation of planetary systems like our own," concluded Janson

[back](#)

An Olympic Test for Your Vision – January 13/10 credit *OneMinuteAstronomer.com*



In the spirit of this month's Olympic Winter Games in Vancouver, we present three pairs of stars in the Hyades to test your visual acuity. Give these pairs a try on an upcoming clear night. And if you can resolve them with your unaided eye, then, well, give yourself a medal!

Left: A map of the Hyades star cluster, adapted from *Stargazing for Beginners: A Binocular Tour of the Night Sky*. The Hyades is the V-shaped group of stars halfway between the Pleiades and the bright star Betelgeuse in Orion. You need no telescope to observe them. The cluster is spread out over a patch of sky as large as your fist extended at arms length, and 11 stars shine at magnitude 4.5 or brighter. A modest pair of binoculars reveals dozens more stars, and the whole cluster is quite dazzling.

Preliminaries

Before you go to the medal round, see if you can resolve the pair called the "Deltas" in the northern branch of the "V" of the Hyades. There are two stars here, and a third a little further away. With average eyesight (or a pair of prescription glasses), most observers can resolve the Deltas with the unaided eye in reasonably dark sky. If you succeed, then congratulate yourself. You've qualified for the finals.

Bronze

You get a bronze medal if you can split the "Sigmata", just 1 degree southeast of Aldebaran. These stars are magnitude 4.7 and 5.1, and separated by 7.2'. If you can split the Double-Double in Lyra, you can probably handle the Sigmata. If so, try for the silver...

Silver

If you can split the "Kappas", you get the silver. These stars are north of the "V" (see the map above). These stars are 5.6' apart, but are made more challenging by their difference in brightness. One star is magnitude 4.2, the other, 5.3. That's a factor of 2.8. If you can split these, you've earned your silver medal. Think you can do better? Then try for the gold

Gold

The gold medal goes to you if you can resolve 80 and 81 Tauri. You need dark skies for these: they're

just on the edge of visual detection at magnitudes 5.6 and 5.5, and they're separated by just 8'.

If you have trouble with even the bronze pair of stars, or if your sky is a little too bright to see these stars at all, don't worry. Just grab a pair of binoculars and enjoy the view of the Hyades, the Pleiades, and the nearby sights in Orion and Canis Major. This is a great region for taking astrophotographs with a digital camera (no telescope required).

Note: These gold-silver-bronze pairs of optical doubles were suggested in Steven James O'Meara's lyrical survey of the Caldwell objects.

[back](#)

NSF Selects National Solar Observatory to Build World's Largest Solar Telescope— January 22/10 credit NSO, Sunspot, New Mexico

The National Science Foundation has awarded a \$298 million cooperative support agreement to the Association of Universities for Research in Astronomy (AURA) to build the 4-meter Advanced Technology Solar Telescope (ATST).

"I want to congratulate everyone who has helped make this happen," said Stephen L. Keil, director of the National Solar Observatory (NSO) and AURA's principal investigator for ATST. "It should be an exciting next several years as we bring ATST to reality."

ATST will be the largest and most capable solar telescope. No comparable facility exists or is planned. ATST will be the world's flagship facility for the study of magnetic phenomena in the solar atmosphere and will be the first large, ground-based, open-access solar telescope in the United States in more than 40 years.

"This is an exciting opportunity for the NSO to lead the community," said William Smith, president of AURA. "We look forward to achieving a first-rate, cutting-edge facility."

ATST is to be built atop Haleakala, Maui, Hawaii, pending completion of a Conservation District Use Agreement and other permits. Haleakala was selected after considering 72 sites and then narrowing those down to six for additional consideration through on-site testing. Of those six sites, only the Haleakala site met all of ATST's requirements — the least atmospheric blurring, the most annual hours of low sky brightness, the lowest dust levels, and the smallest temperature extremes. The site is next to the existing Mees Solar Observatory that is owned and operated by the University of Hawaii's Institute for Astronomy, a principal partner in the project.

Understanding the role of magnetic fields in the outer regions of the Sun is crucial to understanding the solar dynamo, solar variability, and solar activity, including flares and mass ejections, which can significantly affect life on Earth. ATST research will investigate solar variability and its impact on terrestrial climate — the conditions responsible for solar flares, coronal mass ejections, and other activities that can impact terrestrial communications and power systems, disrupt satellite communications, and endanger astronauts and air travelers.

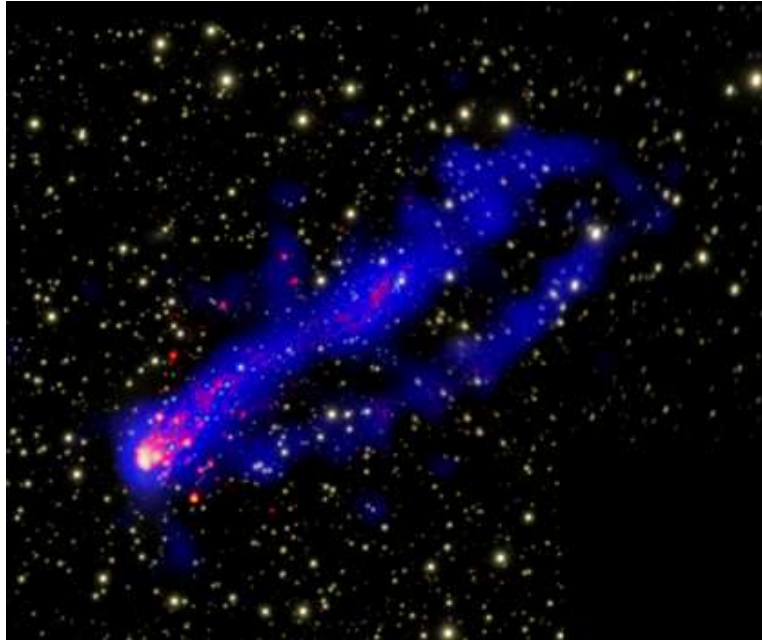
ATST's 4-meter primary mirror will feed an advanced array of instruments designed to study the Sun in light ranging from near ultraviolet (350 nm) into the far infrared (28,000 nm, or 28 microns). High-order adaptive optics, pioneered by the NSO and its partners at NSO's Dunn Solar Telescope at Sunspot, New Mexico, will correct blurring of solar images caused by Earth's atmosphere, thus allowing ATST to observe features in the solar atmosphere with unprecedented sharpness, down to structures only a few tens of kilometers in size.

ATST will observe both on the bright solar disk and in the ultra-faint corona. ATST will accurately measure magnetic fields in the ultra-faint corona, which is only a few parts in a million as bright as the solar disk



[back](#)

MSU Contributes to New Research on Star Formation - January 21/10 credit Chandra



EAST LANSING, Mich. - "Crazy" and "cool" are two of the words Michigan State University astronomer Megan Donahue uses to describe the two distinct "tails" found on a long tail of gas that is believed to be forming stars where few stars have been formed before.

Donahue was part of an international team of astronomers that viewed the gas tail with a very long, new observation made by the Chandra X-ray Observatory and detailed it in a paper published this month in the publication *Astrophysical Journal*.

"The double tail is very cool - that is, interesting - and ridiculously hard to explain," said Donahue, a

professor in MSU's Department of Physics and Astronomy. "It could be two different sources of gas or something to do with magnetic fields. We just don't know."

What is also unusual is the gas tail, which is more than 200,000 light years in length, extends well outside any galaxy. It is within objects such as this that new stars are formed, but usually within the confines of a galaxy. "This system is really crazy because where we're seeing the star formation is well away from any galaxy," Donahue said. "Star formation happens primarily in the disks of galaxies. What we're seeing here is very unexpected." This gas tail was originally spotted by astronomers three years ago using a multitude of telescopes, including NASA's Chandra X-ray Observatory and the SOUTHERN Astrophysical Research telescope, a Chilean-based observatory in which MSU is one of the partners. The new observations show a second tail, and a fellow galaxy, ESO 137-002, that also has a tail of hot X-ray-emitting gas.

How these newly formed stars came to be in this particular place remains a mystery as well. Astronomers theorize this gas tail might have "pulled" star-making material from nearby gases, creating what some have called "orphan stars." "This system continues to surprise us as we get better observations of it," Donahue said. The gas tail is located in the southern hemisphere near a constellation called Triangulum Australe, in a giant cluster of galaxies called Abell 3627. It is associated with a galaxy known as ESO 137-001 which is about 219 million light years from our own Milky Way Galaxy.

Star formation is a continuous process throughout the universe, where there are estimated to be billions of galaxies, each of which contains billions of stars. Stars are formed from clouds of dusty, cool, dense molecular gas. Molecular gas clouds prefer to inhabit galaxies, particularly the disks of galaxies like the Milky Way. Our sun, a star located within the Milky Way Galaxy, is an average-size star estimated to be about 4.6 billion years old.

###

Michigan State University has been advancing knowledge and transforming lives through innovative teaching, research and outreach for more than 150 years. MSU is known internationally as a major public university with global reach and extraordinary impact. Its 17 degree-granting colleges attract scholars worldwide who are interested in combining education with practical problem solving.

[back](#)

Live Long and Prosper, Xanthoria Elegans— February 1/10 credit ESA

Space is a hostile environment for living things, but small organisms on the Expose-E experiment unit outside Europe's Columbus ISS laboratory module have resisted the solar UV radiation, cosmic rays, vacuum and varying temperatures for 18 months. A certain lichen seems to be particularly happy in

open space!

Here on Earth, living organisms can be found almost everywhere, from the abysses of the oceans to the highest mountain peaks. Even extremely dry deserts and cold glaciers support some kind of life.



Recent findings from martian meteorite samples provide stronger evidence that life might have existed within our neighbouring planet too, so perhaps there is also some kind of life on the red surface of Mars.

To find out how our terrestrial organisms survive in space conditions, ESA has backed astrobiological research for more than 20 years. "The purpose is to increase our knowledge on the origin, evolution and adaptations of life and also provide an

experimental basis for recommendations for planetary protection," says René Demets, a biologist working in ESA.

Expose it



The most recent experiment carrier was Expose-E, launched to the International Space Station (ISS) in February 2008 aboard Space Shuttle Atlantis and carried back to Earth by Space Shuttle Discovery last September. A total of 664 biological and biochemical samples were exposed to open space for 18 months.

Expose-E is a suitcase-sized box divided into two layers of three experiment trays, each holding four squared recesses. All but two of these 12 boxes hold a suite of biological or biochemical samples in small compartments. Two of the three trays were directly exposed to the vacuum of space and the third has gas inside, simulating the thin martian atmosphere consisting mainly of carbon dioxide. The window protecting the 'martian samples' also had an optical filter

imitating the solar spectrum on the martian surface. Two layers of similar experiment trays were used, to have one layer on top exposed to solar light and another underneath in shadow.

An almost identical experiment carrier, Expose-R, remains at the ISS, where it is installed on the Russian part of the station.

Right: Xanthoria Elegans on Expose-E was collected in the mountains of Spain



It's better to be dry

Expose-E samples were provided by eight international scientific groups and the project is coordinated by the Microgravity User Support Centre (MUSC) at the German Aerospace Center (DLR) under the European programme for Life and Physical sciences and applications using the International Space Station (ELIPS) of ESA's Directorate of Human Spaceflight. The research groups are now examining the samples and have released some preliminary scientific results.

"These Xanthoria elegans lichens were flown on Expose-E and they are the best survivors we know," explains Demets. Lichen is a sort of macroscopic composite organism of a fungus and a

photosynthetic partner that is typically alga or cyanobacterium.

"These can be found typically in the most extreme places on Earth.

When they are put in an environment they don't like, they put themselves in off-mode and wait for better conditions. Once you put them back in a suitable environment and give them some water, they just carry on living as before."



Right: René Demets with Biopan container at the surface of Foton-M3 capsule

The key issue is water: it is almost immediately vaporised in the vacuum of space. Only anhydrobiotic organisms, which are dry and capable of sustaining long periods in extremely dry conditions, can survive space vacuum. Apart from lichens, only a few animals and plants can resist the vacuum: water-bears, brine shrimp and larvae of the African midge *Polypedilum vanderplank* are the only animals known to survive open space. Some dried plant seeds are also dry enough.

Other space hazards are the repeated extreme temperature changes and radiation. "Radiation is a big danger for life in space", says Demets. "Cosmic rays are very energetic and ionising, but the most damaging is the hard UV radiation from the Sun. Here on the ground, UV-C is used mainly in applications where you need to kill bacteria." Over time the effects of high-energy particles, X-rays and gamma radiation are more important, because they destroy DNA and cause genetic mutations.

Space-travelling bugs?



MUSC is conducting a parallel ground simulation exposing similar samples to the same environmental parameters as in space, with the exception of low gravity and ionising radiation. "This simulation will last throughout the whole mission and after this we will have the final results," says Demets. "I can't wait for that moment, because we already know that we'll have interesting results."

The fact that living organisms do survive in open space seems to support the idea of panspermia – life spreading from planet to another, or even between solar systems. "The loose end in this theory is now arrival at a planet, because no living thing can survive the fiery entry through an atmosphere," Demets says. "But possibly deep inside a space rock the conditions are better. Therefore we're now thinking of an astrobiology experiment involving a return to Earth".

[back](#)

Obama Budget Scraps NASA Moon Plan for '21st Century Space Program'

February 1/10 *credit Space.com*

President Barack Obama's 2011 budget request has effectively shut down NASA's five-year effort to return astronauts to the moon, leaving the U.S. space agency with lofty goals – but no firm deadlines – to once again send humans beyond Earth orbit.

The budget request, released today, would scrap NASA's Constellation program to build the Orion spacecraft and Ares rockets for new manned moon missions – a \$9 billion investment to date. The request calls for \$19 billion in funding for NASA in 2011, a slight increase from the \$18.3 billion it spent in 2010.

The request does, however, pledge extra funding to extend the life of the International Space Station through at least 2020 and offers \$6 billion over five years to support commercially built spaceships to launch NASA astronauts into space. The space agency's three remaining space shuttles are due to retire later this year.

The budget announcement occurred on the seventh anniversary of NASA's Columbia shuttle disaster on Feb. 1, 2003, in which seven astronauts were killed during re-entry due to wing heat shield damage. It came just days after the 24th anniversary of the Challenger shuttle accident that killed seven astronauts on Jan. 28, 1986.

NASA Administrator Charles Bolden, a former space shuttle commander, said that while the budget cancels the program building the agency's space shuttle replacement – the Orion crew vehicle – it is not trading away safety to embrace new, privately built spaceships to fly astronauts. It also paves the way for a "21st Century space program," he said.

"No one cares about safety more than I. I flew on the space shuttle four times. I lost friends in the two space shuttle tragedies. So I give you my word these vehicles will be safe," Bolden said. "They will fulfill a critical NASA need, spur industrial innovation, and free up NASA to do the bold, forward-leaning work that we need to do to explore beyond Earth."

Bolden said NASA has already made new agreements with several commercial spaceflight companies to spur their efforts. NASA and the White House Office of Science and Technology plan to make an announcement related to commercial spaceflight providers on Tuesday, NASA officials said.

"This new path is a big change. I realize that," Bolden told reporters in a teleconference. "But it is not a change from the guiding principles of NASA. It makes America stronger. It enables us to draw more strongly on the ingenuity of the commercial sector and create deeper ties with our international partners."

The new plan is not without its opponents, particularly in states that have traditionally been home to

major NASA efforts.

"This is a crippling blow to America's human spaceflight program," said Congressman Pete Olson (R-Texas). "It has taken over 50 years to build and develop America's ascension to its rightful place as the dominant player in human spaceflight. That dominance is apparently no longer desired."

Texas is home to NASA's Johnson Space Center, where astronauts train for space missions and the Mission Controls for the shuttle fleet and International Space Station are headquartered.

Scrapping Constellation

Announced in 2005, NASA's Constellation program aimed at retiring the space shuttle fleet this year and replacing it with new capsule-based vehicles (called Orion) designed to launch on Ares I rockets, with a larger heavy-lift rocket called Ares V launching lunar landers and rocket stages needed for moon-bound missions. The moon plan, announced by former President George W. Bush in 2004, was aimed at returning astronauts to the moon by 2020.

It would cost \$100 billion, roughly the current price tag of the International Space Station. Cancelling the program will cost more than \$2 billion in closing costs, NASA officials said.

Last year, an independent committee led by former Lockheed Martin CEO Norman Augustine reviewed NASA's moon plan and found it hobbled by severe underfunding and delays. NASA wouldn't make it back to the moon until 2028, and even then wouldn't have money to build the lander to set down on it, the committee found.

The committee submitted several options for the president, which included embracing commercially built spacecraft and pushing aside NASA's current spaceflight plan for bolder expeditions to the moon, asteroids or Mars.

"The plan released with the President's FY 2011 budget does appear to respond to the primary concerns highlighted in our committee's report," Augustine said in a statement.

Lori Garver, NASA's deputy administrator, told reporters today that the new budget request provides an overhaul of NASA's spaceflight exploration plan.

The request would set aside \$369 million for vital technology development and test programs, with \$183 million earmarked to support the International Space Station through 2020. The station was slated to be decommissioned in 2016, a year before the Augustine committee believed NASA's new Orion ship would be ready to ferry astronauts to it.

The new budget would set aside \$3.1 billion in funding to develop better heavy-lift rockets and more advanced space propulsion technology to explore faster and farther out into the solar system, NASA officials said.

"What this program does is give us back the solar system," Garver said. Garver and Bolden did not announce details for new vehicles, specific destinations or potential timetables for new manned missions beyond low-Earth orbit. But Garver did say that, if NASA's 2011 budget is approved, the agency could accomplish those goals well before the 2028 timeframe proposed by the Augustine committee. The agency is hoping commercially built space ferries could be ready to fly astronauts by 2016, she added.

Beyond human spaceflight

President Obama's 2011 budget request for NASA also spotlights other areas within the space agency that have suffered in recent years due to the agency's focus on human spaceflight.

The request includes \$170 million to replace NASA's lost Orbiting Carbon Observatory, a probe aimed at studying climate change, which was destroyed during a launch failure last year. About \$3.2 billion is set aside for science research grants and missions, including a potential successor to the Hubble Space Telescope.

About \$146 million – a \$20 million increase – is allocated in the 2011 budget request to support education and public outreach. It is aimed at spurring interest in science, technology, mathematics and space among the American youth and general public, Garver said.

"There are so many wonderful things that can be done with NASA," Garver said. "It is the people's

program and we're giving it back to them."

[back](#)

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.

[back](#)

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.

[back](#)

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.

Astronomy Youth Essay Contest

Astronomy.com is now accepting submissions for the 2010 Youth Essay Contest! The title for submitted essays is "What I love best about astronomy."

Prize: Two (2) round-trip airline tickets and 3-night accommodations for travel from anywhere in North America to the Northeast Astronomy Forum in Suffern, New York. NEAF will run April 17 to 18, 2010. Retail value: \$2,000, Entrants must be 17 years of age or younger on May 1, 2010. The winner must be accompanied on the trip by a parent or guardian.

Hurry! Entries must be postmarked or e-mailed by **February 15, 2010**. Entries must be 300-500 words, submitted in electronic copies in Microsoft Word. E-mail entries must be sent as attachments with the subject "**Youth Essay Contest**." All entries must include the writer's name, address, age, telephone number, and e-mail address. E-mail your entry to: mquandt@kalmbach.com

The Astronomy staff will judge the entries. The winner will be announced on the Astronomy.com Web site on or about March 1.

Give a Hoot for Valentines *Courtesy of FamilyFunMagazine*

Materials:

Card stock or scrapbooking paper
 Scissors
 White paper or card stock
 Glue
 New pencil

Instructions:

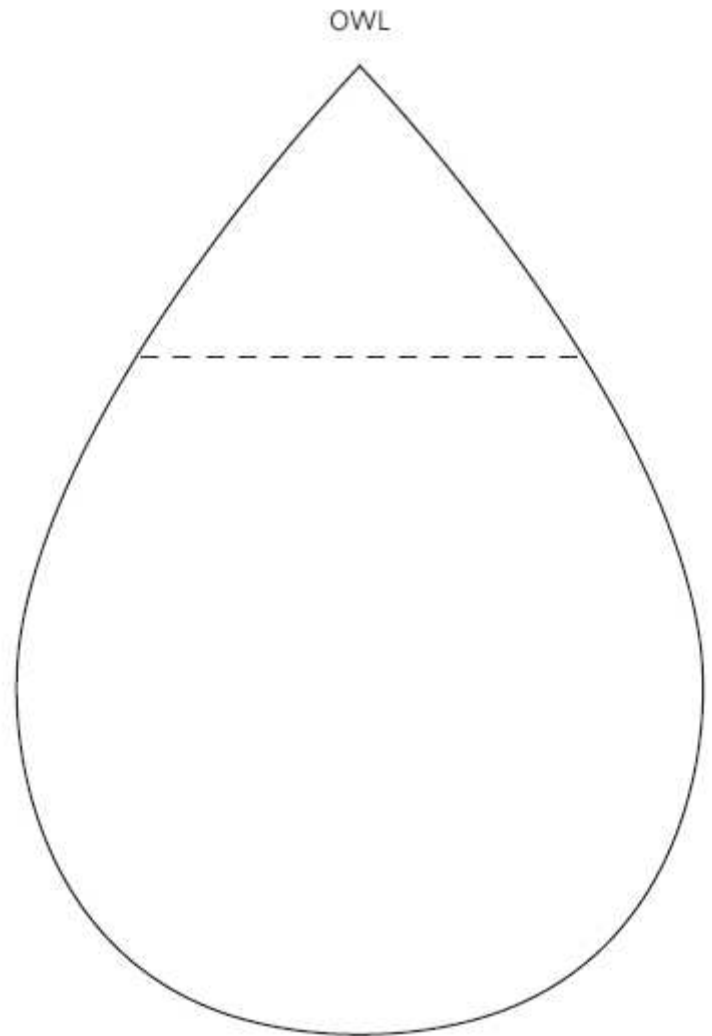
To make an owl, Trace and cut the owl template (the teardrop shape) from card stock or scrapbooking paper.

Fold over the narrow end, then cut the owl's forehead, as shown.

Next, draw and cut eyes from white paper or card stock, then glue them to the card. Cut vertical slits about an inch apart near the bottom of the owl's body and slip a pencil through the slits.

Messages to use:

I will Owl-wise love you,
 I will Owl-ways be your friend,
 You're Owl-right,
 To a real wise guy
 You're a hoot



[back](#)

10. The Sky This Month

By Bryon Thompson

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

Whatever your sleeping pattern, there is something for everyone in the sky this month.

If you're an early to bed "kind of person" "before "counting sheep" grab your binoculars and see if you can spot Venus and Jupiter pass within a single moons-width of each other. The best time to see the show is in the early twilight of **February 16th**. You will need a clear, unobstructed view of the western horizon as it will be low. It won't be easy to see through the twilight, but if you do then pat yourself on the back and go to bed.

If your view is from the east then look for the bright red object at dusk. Mars reached its peak last month and is still performing this month and is almost the brightest nighttime star with exception to Sirius which is to the right of Mars. On **February 6 & 7** during its westward trek, Mars will pass some 3° north of the Beehive Cluster (M44). Your binoculars will provide the best view of this interaction. Watch for the Moon which passes 5° south of Mars on **February 24th**.

Speaking of the Moon, I hope you had the chance on **February 1 & 2nd** to see Atlas and Hercules as

the setting sun illuminated their eastern rims. You have another chance to view these lunar gods on the evening of **February 17 & 18** when their dark shadows and bright rims appear reversed when sunlight comes from the opposite direction.

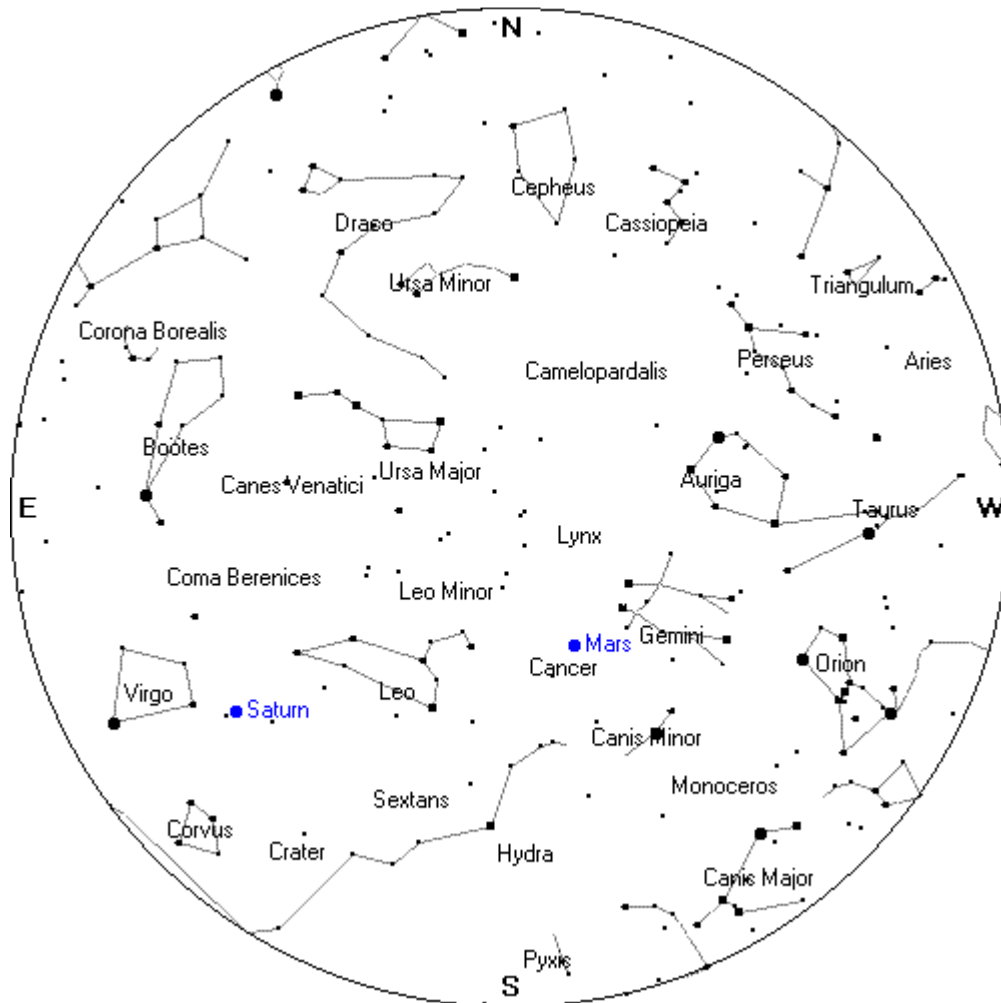
Ok you "nighthawks" you know who you are, there's always something for you to see. Mars offers up some excellent views from your telescope this month if you can wait until it rises at least 40° above the horizon. The most prominent feature will be the northern polar cap which is tilting toward Earth. Take a few minutes in Leo to look for the asteroid Vesta. Vesta is a one of the largest asteroids, with a diameter of 330 miles. It is bright enough all month to see with binoculars but the key is to know where to find it. Vesta reaches its peak on **February 17 & 18**. Look 0.2° south of the star Algieba and .03° west of the star at opposition the following night. Saturn reaches its highest point in the south after midnight. The ringed planet lies in the constellation Virgo the maiden. The planets brightness nearly matches Virgo's brightest star Spica. If you want to experience a 'Wow factor', then look at Saturn through a telescope. The rings are always a show stopper. The good news is that throughout 2010 the rings will continue to open wider to our view. If you're not too sleepy, see if you can catch a view of one of its many moons. For you comet chasers there are two that are viewable with a 4 inch scope under dark skies. On **February 13** during the new moon, comet 81P/Wild is visible a few degrees north of Virgo's star Spica. The second comet C/2007 Q3 (siding spring) usually appears fan shaped, however, this month due to the sun's influence on **February 17th** and the comets path the around the sun, we will look at the fan edge-on and it will appear 'spikey'. Take some time to check out these fuzballs!

If you're one of those early risers or are in the habit of getting up before dawn and can't go back to sleep then instead of turning on the TV, get outside and see if you can spot Mercury low in the southeastern sky. Look up around **February 24th** and if your lucky, you may see a meteor streaking across the sky. The Delta Leonid meteor shower peaks just before dawn and appears to radiate from the tail of Leo. The minor shower produces 5 meteors per hour from a dark site but you never know sporadic meteors are known to occasionally flash to brilliance.

No matter what you're looking for there is something for everyone. Till next month, remember, astronomy is looking up.

Feb 5	03:48 PM PST	Last Quarter Moon
Feb 6&7	Early Evening	Mar 3° North of Beehive Cluster
Feb 13	06:51 PMPST	New Moon
Feb 16	Early Evening	Mars & Jupiter Pass Within 1° of Each Other
Feb 17	10:00 PM PST	Vesa at Opposition
Feb 21	04:42 PM PST	First Quarter Moon
Feb 22	Evening	Comet 81P/Wild Brightest at 9 th Magnitude
Feb 24	Early AM	Delta Leonid Meteor Shower Peaks
Feb 24	09:00 PM PST	Moon is 5° South of Mars
Feb 28	08:38 AM PST	Full 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

[back](#)