

Southwest Florida Astronomical Society

SWFAS



The Eyepiece January 2009

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A MESSAGE FROM THE PRESIDENT

I would like to take this opportunity to wish all of you a very healthy, happy, and safe New Year. During our December 2008 SWFAS meeting, we held our election of officers as is customary at this time. The following individuals were nominated on, and elected, to serve as officers for the 2009 year. Bob Francis was elected President, Alice Mack was elected Vice President, Karen Nichols was elected and will stay on as Secretary, and Stewart Rorer was elected Treasurer.

Carole Holmberg will continue as Newsletter Editor, Tony Heiner and Chuck Pavlick will continue as Viewing Coordinators for the Fakahatchee Strand viewing site, Jon Martin will be the Viewing Coordinator for the Caloosahatchee viewing site, Chuck Pavlick will continue as the Program Coordinator, Maria Dorilag will take over the Librarian position, Danny Secary will continue as Club Historian, Sanders Lewallen will continue as Equipment Coordinator, and Dan Fitzgerald will continue as Web Site Manager.

I would like to personally thank Mike Harden for serving as Vice President during 2008, and Ramona Huddleston for serving as Treasurer for 2007 and 2008. I also want to thank everyone who worked so hard in 2008 to help with the various events SWFAS supported. Our presence in Lee County has received a great deal of visibility as being a group of amateur astronomers who work with schools, and public and private organizations teaching adults and children alike about the night sky and the universe we live in.

We have already been asked to support a number of events in January, February and March, with the first event on January 9th for the Girl Scouts of Gulfcoast Florida, Inc. This event will be held at the Eden Park Elementary School in Immokalee. I will be sending out information and asking for volunteers through email since there is such short notice.

Regarding our January 8th meeting location: We will not be meeting in the Planetarium as the facility is being used by FGCU students for a Lab. We will be meeting at the Calusa Nature Center, but in another building, the Iona House. I have not been able to contact Dr. Michael Fauerbach about our annual meeting at FGCU. I don't know whether he is out of town, as he is not responding to emails or telephone messages. We hope to meet there in a future month.

Planets in the evening sky for January consist of Mercury, Venus, Jupiter, and Uranus (in the southwest). Saturn (in the east) can be viewed around Midnight, and then in the morning sky (in the southwest).

Please remember to pay your dues for 2009.

January Meeting

Our December meeting will be at the Calusa Nature Center in the Iona House at 7:30 pm on Thursday, January 8th. We will not be meeting in the planetarium. Iona House is a separate building. When you pull into the Calusa Nature Center parking lot, instead of parking where you normally would, continue to the back of the parking lot. Iona House is the last building that you will see. January's program will be a DVD video: ***Journey to Mt. Palomar***.

Dates Set For Caloosahatchee Regional Park Viewing

They are Jan 24, Feb 21 and Mar 21. These dates should have no moon.

Also, there are new changes for the viewing sites. Namely, if anyone is going to meet Jon Martin at the CRP, or Chuck at the FAK, they have to call or email by 5:00 on the day of the proposed viewing. This is necessary for Jon and Chuck so they won't be sitting around waiting for someone to show up, and then end up being there alone.

Shhh! Gadget Racket Threatens Pulsar Research

Of all the threats to scientific research Wesley Sizemore has stymied over the years, satellites and cell phone towers don't stick in his memory quite like the possessive old hound and its treasured heating pad.

Sizemore is an interference hunter, vigilantly pursuing stray electromagnetic signals that bedevil researchers at the National Radio Astronomy Observatory, which sits on 13,000 square miles tucked away in the nation's only radio-free quiet zone.

Radio observatories need interference-free zones like optical observatories need clear night skies.

Though buffered by ridgetops in a West Virginia mountain valley, 50 miles from the nearest town of any size, the Green Bank observatory is under an audio assault unlike any it's faced in the 50 years since Congress created the quiet zone. Wireless computers and other gadgets are cluttering the same frequencies occupied by signals from neutron stars.

Researchers, mostly looking at pulsar waves that have traveled through space for billions of years, pursue signals so weak they can be easily foiled by anything from power locks on cars to a broken wire inside a heating pad that kept a nearby dog warm in the winter.

"There was enough arcing inside the heating pad that it caught our attention," Sizemore said, again telling what he affectionately calls "that damn dog story."

Over several days, Sizemore - who has a specially equipped truck and gear that can pinpoint an interference source the size of a 50-cent piece - tracked it to a doghouse about 10 miles from the observatory. He bought a new heating pad and all was resolved.

Astronomer Scott Ranson, whose ongoing study of neutron stars has been destroyed more than once by bursts of interference, said collecting data in today's technology-dependent world is like trying to look at stars while a neighbor is shooting fireworks.

"We were completely swamped and our data was useless," he said of one particularly frustrating episode. "We didn't know where it came from. It was there for several hours over a course of a few days."

The observatory's origins hail from the 1950s when Congress and the West Virginia Legislature created national and state radio quiet zones to protect and promote the relatively new science of radio astronomy.

While Green Bank is one of many radio telescope observatories around the world, it's unique because it features the world's largest steerable radio telescope. Completed in 2000, the ultra-sensitive scope is taller than the Statue of Liberty and heavier than a fleet of Boeing 747s, with a reflective dish that could hold 60,000 people.

Visitors must walk, bike or ride to the giant telescope in a diesel-powered bus because diesel motors rely on compression instead of spark plugs to ignite. Guests must turn off digital cameras and use film to take pictures.

Even the signals from space received by the telescope are sent to computers via fiber-optic cable rather than wirelessly to prevent interference. Inside the observatory, walls are lined with copper, and computer equipment is housed in metallic cages that block radiation and protect the telescope.

- by Tom Breen, <http://apnews.myway.com/article/20081231/D95DOIG00.html>

Paper Plate Astronomy

The Paper Plate Education website (<http://analyzer.depaul.edu/paperplate/>) serves the Universe on a paper plate. There are many astronomy activities included, such as a simple paper plate activity uses the position of the circumpolar stars to determine their position throughout the year for any given date and time. See the Platisphere activity at <http://analyzer.depaul.edu/paperplate/Platisphere.htm> for an inexpensive activity that works all year long.

- Chuck Bueter, *Astronomy From the Ground Up*

Mars Science Laboratory Launch Delayed to 2011

Launch of NASA's showcase Mars Science Laboratory, a nuclear-powered rover the size of a small car, will be delayed from 2009 to 2011 because of ongoing development problems. The cost of the delay through end of mission will add some \$400 million to the project's price tag, pushing the projected cost from \$1.88 billion to around \$2.2 billion.

Joining NASA Administrator Mike Griffin in announcing the delay, Ed Weiler, NASA's associate administrator for space science, also told reporters that NASA and the European Space Agency have agreed to work together on future Mars missions, including an eventual robotic flight to collect soil and rock samples and return them to Earth for analysis. Such a mission likely would cost between \$6 billion and \$8 billion, Weiler said, and would not be feasible until the 2020s. Mars launch opportunities come around every two years and the delay for the Mars Science Laboratory to 2011 will have downstream impacts on other upcoming Mars missions and possible impacts on flights to other destinations as well. So far, Weiler said, no outright cancellations are expected. But the delay will provide an early window of opportunity for NASA and ESA to begin planning for joint missions in the next decade.

MSL is the flagship of Mars exploration, one of the most complex spacecraft ever built for planetary exploration. Designed to drop to the surface of Mars on elevator-type cables suspended from a rocket-powered descent stage called a "sky crane," the one-ton Mars Science Laboratory will be equipped with the most sophisticated suite of instruments ever placed on the surface of the red planet to help determine if Mars ever did, or still does, support microbial life. MSL dwarfs NASA's solar-powered Spirit and Opportunity rovers, which tipped the scales at 384 pounds each, carried just 35 pounds of science instruments and could only operate in daylight. MSL will weigh 1,929 pounds and include a science payload of 183 pounds. Its radioisotope thermoelectric generator, or RTG, will allow it to operate around the clock for two years or more. But the mission has encountered a steady stream of technical problems that have stretched out development and driven up costs. The latest, the one that triggered the launch delay, involves subtle issues with complex actuators that do everything from driving the rover's six wheels to moving its robot arm.

The actuators at the heart of the current discussion are complex motor-gearbox assemblies, some with more than 500 parts each. MSL is equipped with 31 such actuators and in recent months, engineers have run into workmanship issues, problems with encoders that track motion and as-yet-unresolved questions about the braking mechanism.

The actuators are "absolutely crucial to the success of this mission," said Doug McCuistion, director of Mars exploration at NASA Headquarters. "If we get to the ground, we can't move, we can't put the arm out and we can't sample, we basically have a metric ton of junk on the surface. So actuators are absolutely crucial to any landed mission."

Astronomers Expecting Leonid Outburst in 2009

Astronomers from Caltech and NASA say a strong shower of Leonid meteors is coming in 2009. Their prediction follows an outburst on Nov. 17, 2008, that broke several years of "Leonid quiet" and heralds even more intense activity next November.

"On Nov. 17, 2009, we expect the Leonids to produce upwards of 500 meteors per hour," says Bill Cooke of the NASA Marshall Space Flight Center. "That's a very strong display."

You can get the full story at:

http://science.nasa.gov/headlines/y2008/04dec_leonids2009.htm?list221872

- *NASA News*

Titan's Volcanoes Give Cassini Chilly Reception

Data collected during several recent flybys of Titan by NASA's Cassini spacecraft have put another arrow in the quiver of scientists who think the Saturnian moon contains active cryovolcanoes spewing a super-chilled liquid into its atmosphere.

"Cryovolcanoes are some of the most intriguing features in the solar system," said Rosaly Lopes, a Cassini radar team investigation scientist. "To put them in perspective -- if Mount Vesuvius had been a cryovolcano, its lava would have frozen the residents of Pompeii."

Rather than erupting molten rock, it is theorized that the cryovolcanoes of Titan would erupt volatiles such as water, ammonia and methane. Scientists have suspected cryovolcanoes might inhabit Titan, and the Cassini mission has collected data on several previous passes of the moon that suggest their existence. Imagery of the moon has included a suspect haze hovering over flow-like surface formations. Scientists point to these as signs of cryovolcanism there.

"Cassini data have raised the possibility that Titan's surface is active," said Jonathan Lunine, a Cassini interdisciplinary scientist. "This is based on evidence that changes have occurred on the surface of Titan, between flybys of Cassini, in regions where radar images suggest a kind of volcanism has taken place."

What led some Cassini scientists to believe that things are happening now were changes in brightness and reflectance detected at two separate and distinct regions of Titan. Reflectance is the ratio of light that radiates onto a surface to the amount reflected back. These changes were documented by Visible and Infrared Mapping Spectrometer data collected on Titan flybys from July 2004 to March 2006. In one of the two regions, the reflectance of the surface surged upward and remained higher than expected. In the other region, the reflectance shot up but then trended downward. There is also evidence that ammonia frost is present at one of the two changing sites. The ammonia was evident only at times when the region was inferred to be active.

"Ammonia is widely believed to be present only beneath the surface of Titan," said Robert M. Nelson of JPL. "The fact that we found it appearing at times when the surface brightened strongly suggests that material was being transported from Titan's interior to its surface." Some Cassini scientists indicate that such volcanism could release methane from Titan's interior, which explains Titan's seemingly continuous supply of fresh methane. Without replenishment, scientists say, Titan's original atmospheric methane should have been exhausted long ago. But other scientists familiar with the spectrometer data argue that the ammonia identification is not certain, and that the purported brightness changes might not be associated with changes on Titan's surface. Instead they might result from the transient appearances of ground "fogs" of ethane droplets very near Titan's surface, driven by atmospheric rather than geophysical processes. Nelson has considered the ground fog option, stating, "There remains the possibility that the effect is caused by a local fog, but if so, we would expect it to change in size over time due to wind activity, which is not what we see."

For more information about the Cassini-Huygens mission, visit: <http://saturn.jpl.nasa.gov> and <http://www.nasa.gov/cassini> .

A Giant Breach in Earth's Magnetic Field

NASA's five THEMIS spacecraft have discovered a breach in Earth's magnetic field ten times larger than anything previously thought to exist. Solar wind can flow in through the opening to "load up" the magnetosphere for powerful geomagnetic storms. But the breach itself is not the biggest surprise. Researchers are even more amazed at the strange and unexpected way it forms, overturning long-held ideas of space physics.

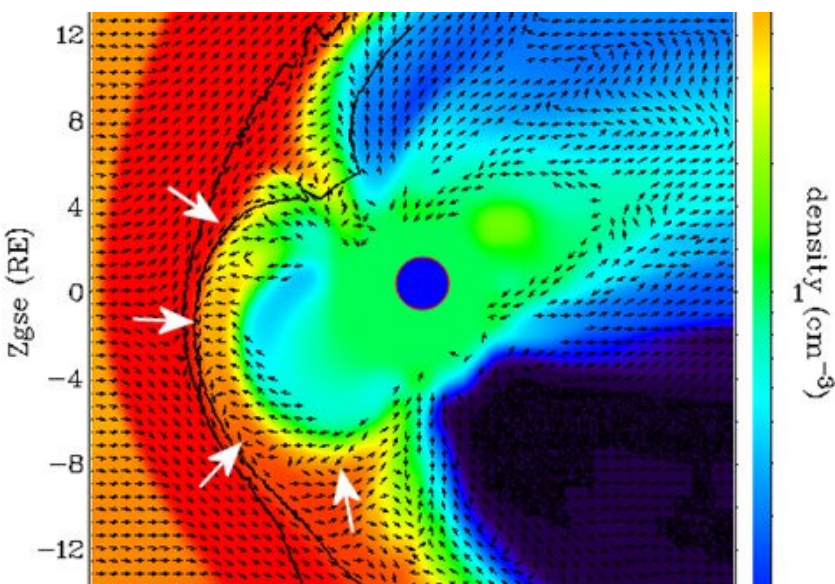
The magnetosphere is a bubble of magnetism that surrounds Earth and protects us from solar wind. Exploring the bubble is a key goal of the THEMIS mission, launched in February 2007. The big discovery came on June 3, 2007, when the five probes serendipitously flew through the breach just as it was opening. Onboard sensors recorded a torrent of solar wind particles streaming into the magnetosphere, signaling an event of unexpected size and importance.

"The opening was huge—four times wider than Earth itself," says Wenhui Li, a space physicist who has been analyzing the data. Li's colleague Jimmy Raeder says " 10^{27} particles per second were flowing into the magnetosphere—that's a 1 followed by 27 zeros. This kind of influx is an order of magnitude greater than what we thought was possible."

The event began with little warning when a gentle gust of solar wind delivered a bundle of magnetic fields from the Sun to Earth. Like an octopus wrapping its tentacles around a big clam, solar magnetic fields draped themselves around the magnetosphere and cracked it open. The cracking was accomplished by means of a process called "magnetic reconnection." High above Earth's poles, solar and terrestrial magnetic fields linked up (reconnected) to form conduits for solar wind. Conduits over the Arctic and Antarctic quickly expanded; within minutes they overlapped over Earth's equator to create the biggest magnetic breach ever recorded by Earth-orbiting spacecraft.

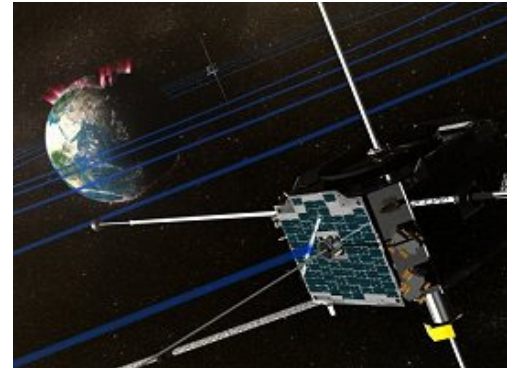
The size of the breach took researchers by surprise. "We've seen things like this before," says Raeder, "but never on such a large scale. The entire day-side of the magnetosphere was open to the solar wind."

The years ahead could be especially lively. Raeder explains: "We're entering Solar Cycle 24. For reasons not fully understood, CMEs in even-numbered solar cycles (like 24) tend to hit Earth with a leading edge that is magnetized north. Such a CME should open a breach and load the magnetosphere with plasma just before the storm gets underway. It's the perfect sequence for a really big event."



Right: A computer model of solar wind flowing around Earth's magnetic field on June 3, 2007. Background colors represent solar wind density; red is high density, blue is low. Solid black lines trace the outer boundaries of Earth's magnetic field. Note the layer of relatively dense material beneath the tips of the white arrows; that is solar wind entering Earth's magnetic field through the breach. Credit: Jimmy Raeder/UNH.

- from Science@NASA



365 Days of Astronomy

365 Days of Astronomy is a daily podcast about space, recorded and produced by people around the world; there will be one podcast for each day of 2009. It is organized by the New Media Working Group of the International Year of Astronomy. 365 Days of Astronomy is looking for individuals, schools, companies and clubs to provide around eight minutes of audio for the daily podcast. You can do as few as one episode or up to 12 episodes (one per month, subject, of course, to the project's editorial discretion). The podcasts can be about virtually any astronomical topic, from simple concepts or how-tos to more in-depth discussions of complex concepts. The 365 Days of Astronomy project will do post-production on all submissions, so knowledge of audio editing may not be necessary. If you can't record your own audio,

you may also just provide a script, and we'll take it from there.

To join in, send an email to (signup at 365daysofastronomy.org) indicating your interest and your preferred broadcast date (or a range of dates).

To learn more: <http://365daysofastronomy.org>

- *Emily Lakdawalla, The IYA New Media Working Group, <http://365daysofastronomy.org>*

NASA Unveils Post-Columbia Crew Study

NASA has released a detailed engineering study outlining lessons learned about astronaut survival based on an analysis of the 2003 Columbia disaster. The study does not provide any significant new details about the fate of Columbia's crew - investigators earlier concluded the seven astronauts died of sudden oxygen loss and blunt force trauma as the crew module broke up - but a new timeline shows the pilots attempted to troubleshoot a cascade of problems in the final moments before the spacecraft's computers lost control. The timeline also shows, in grim detail, the forces acting on the shuttle's crew module in the final minute or so before it broke apart, subjecting the astronauts to a sudden loss of air pressure that occurred so rapidly they did not have time to close their helmet visors.

The study, the most detailed astronaut survival study ever conducted, includes 30 recommendations for improving crew safety on future flights based on a review of the safety equipment and procedures used during Columbia's mission.

The Columbia breakup was not survivable, but the new report sheds light on how various shuttle safety systems performed and what sort of changes may be needed to improve safety in future spacecraft like the Orion capsules that will replace the shuttle after the fleet is retired in 2010.

The 400-page report is posted on line at: <http://www.nasa.gov/reports>

Saturn's Rings Disappear

As Saturn goes around the sun, once every 14 to 15 years it turns its rings edge-on to Earth. Because the rings are so thin, they can actually disappear when viewed through a backyard telescope. The best time to look is now. The 0.8-degree opening angle of Christmas 2008 was the minimum for some time to come. In January 2009 the rings begin to open up again, a temporary reversal caused by the relative orbital motions of Earth and Saturn. By the time narrowing resumes in summer 2009, Saturn's position in the sky will be approaching the sun, so looking at it through a telescope then could actually be dangerous. The next ring plane crossing that's easy to watch won't come until 2038.

For the full story link to: http://science.nasa.gov/headlines/y2008/22dec_crazytilt.htm

Control a Telescope Online

Check out <http://microobservatory.org> . The MicroObservatory online telescope network lets you explore the universe using working telescopes that YOU control via the Internet free of charge, and have access to your image within 48 hours!

Each of the easy-to-follow activities allows you to investigate different aspects of the universe just like a professional astronomer. You select your target, choose exposure times or filters, then sit back and hope for clear skies!

Rare Eclipse of EE Cephei Is Set To Begin

Every 5.6 years, an unseen companion crosses in front of a 10.8-magnitude star in the constellation Cepheus, making it dim for a few weeks. The next eclipse of this star, known as EE Cephei, is expected in mid-January 2009. But because these dimmings are leisurely affairs, the American Association of Variable Star Observers (AAVSO) urges experienced amateurs to start monitoring the star right now, and to continue through the end of February.

An interval of years between minima is unusually long for a star system of this type. But more intriguing is the fact that successive fadings of EE Cephei over the past half century have not been carbon copies of one another. Sometimes the star becomes just half as bright as normal, and other times it fades by a factor of five! And the light curve sometimes has kinks in it, hinting the companion may not even be round.

What could the mystery companion be? "It's probably a small, cool star or close binary surrounded by a dust torus, kind of a cosmic doughnut," says the AAVSO's Mike Simonsen. In his blog at <http://simostronomy.blogspot.com/2008/12/mystery-star.html>, he tells the history of this star and suggests models that could explain the light-curve changes. But there's a chance the light curve in early 2009 will deviate in some new way, upsetting the apple cart again.

EE Cephei lies 1.5° southwest of 4.2-magnitude Epsilon (ϵ) Cephei, where it marks the easternmost corner of a distinctive trapezoid of 11th-magnitude stars spanning less than 4 arcminutes. The variable lies at right ascension 22h 09m 22.8s, declination +55° 45' 24" (equinox 2000.0).

Simonsen's blog includes a link to AAVSO finder charts for EE Cephei. Once there, enter "EE CEP" (without quotes) in the box for the name of the star.

- *AstroAlert from Sky & Telescope*



The Space Place

Superstar Hide and Seek

by Dr. Tony Phillips

It sounds like an impossible task: Take a star a hundred times larger in diameter and millions of times more luminous than the Sun and hide it in our own galaxy where the most powerful optical telescopes on Earth cannot find it.

But it is not impossible. In fact, there could be dozens to hundreds of such stars hiding in the Milky Way right now. Furiously burning their inner stores of hydrogen, these hidden superstars are like ticking bombs poised to 'go supernova' at any moment, possibly unleashing powerful gamma-ray bursts. No wonder astronomers are hunting for them.

Earlier this year, they found one.

"It's called the Peony nebula star," says Lidia Oskinova of Potsdam University in Germany. "It shines like 3.2 million suns and weighs in at about 90 solar masses."

The star lies behind a dense veil of dust near the center of the Milky Way galaxy. Starlight traveling through the dust is attenuated so much that the Peony star, at first glance, looks rather dim and ordinary. Oskinova's team set the record straight using NASA's Spitzer Space Telescope. Clouds of dust can hide a star from visible-light telescopes, but Spitzer is an infrared telescope able to penetrate the dusty gloom.

"Using data from Spitzer, along with infrared observations from the ESO's New Technology Telescope in Chile, we calculated the Peony star's true luminosity," she explains. "In the Milky Way galaxy, it is second only to another known superstar, Eta Carina, which shines like 4.7 million suns."

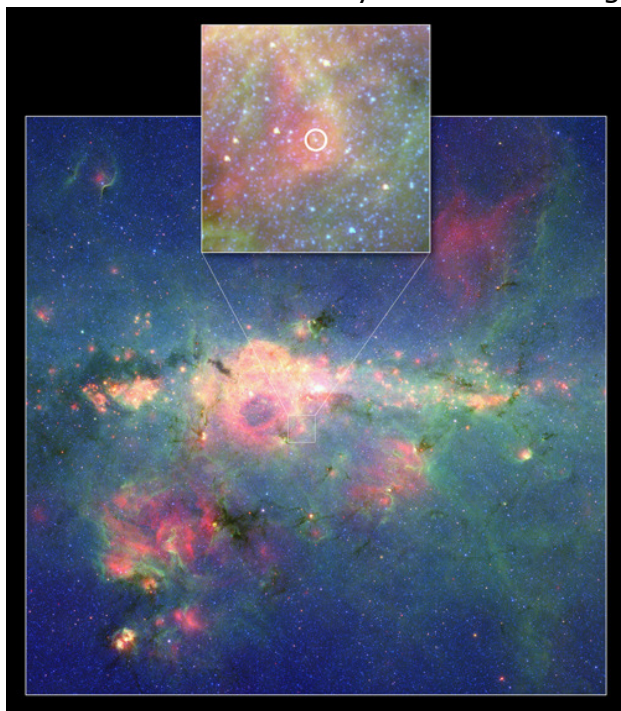
Oskinova believes this is just the tip of the iceberg. Theoretical models of star formation suggest that one Peony-type star is born in our galaxy every 10,000 years. Given that the lifetime of such a star is about one million years, there should be 100 of them in the Milky Way at any given moment.

Could that be a hundred deadly gamma-ray bursts waiting to happen? Oskinova is not worried. "There's no threat to Earth," she believes. "Gamma-ray bursts produce tightly focused jets of radiation and we would be extremely unlucky to be in the way of one. Furthermore, there don't appear to be any supermassive stars within a thousand light years of our planet."

Nevertheless, the hunt continues. Mapping and studying supermassive stars will help researchers understand the inner workings of extreme star formation and, moreover, identify stars on the brink of supernova. One day, astronomers monitoring a Peony-type star could witness with their own eyes one of the biggest explosions since the Big Bang itself.

Now that might be hard to hide.

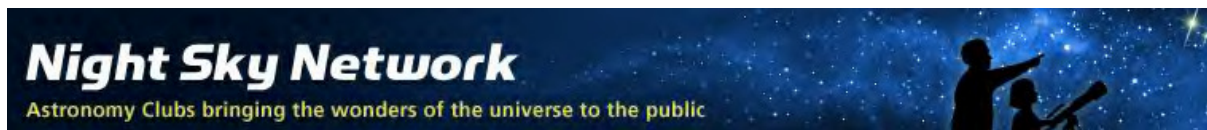
Find out the latest news on discoveries using the Spitzer at www.spitzer.caltech.edu. Kids (of all ages) can read about "Lucy's Planet Hunt" using the Spitzer Space Telescope at spaceplace.nasa.gov/en/kids/spitzer/lucy.



Caption:

The "Peony Nebula" star is the second-brightest found in the Milky Way Galaxy, after Eta Carina. The Peony star blazes with the light of 3.2 million suns.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Dear Night Sky Network members:

January 15th is just around the corner. Get ready for the Telecon.

We want you to enjoy our exciting IYA 2009 telecon series given by Dr. Mark Showalter a SETI Institute planetary astronomer. Dr. Showalter will speak about our Solar System.

Join the Teleconference on Thursday, January 15th at 9:00 pm Eastern.

Dr. Showalter is a specialist in the moons and rings of our Solar System and has even discovered a few moons himself.

To log into the Telecon on Thursday, January 15th, between 8:45 - 9:00pm:

Use the toll-free conference call line: 1-888-455-9236

An operator will answer and:

- You will be asked for the passcode: NIGHT SKY NETWORK
- You will be asked to give your NAME and the CLUB you belong to, and number of people listening with you.

The PowerPoint will be available a few days before the telecon here:

http://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=359

If you have any questions, please contact the Night Sky Network Administrators at: nightskyinfo@astrosociety.org

Mark your calendars for Thursday, February 19th for the February telecon with Dr. Connie Walker on Dark Sky Awareness:

<http://www.darks skiesawareness.org/>

We look forward to hearing from you. Happy IYA 2009!

- *Marni Berendsen, Kenneth Frank and Vivian White, Night Sky Network Administrators*

SWFAS Minutes – December 4, 2008

8:00 – Meeting called into session by President Bob Francis
Introduction and welcome to new members and visitors

Financial audit performed by Stuart and Ramona. Audit report read.

Election of officers.

There are four Officer positions available for 2009 along with several other volunteer positions.

Nominations for 2009:

President - Bob Francis

Vice President – Alice Mack

Secretary – Karen Nichols

Treasurer – Stewart Rorer

Program Coordinator - Chuck Pavlick

Newsletter – Carole Holmsberg

FAK coordinator – Tony Heiner & Chuck Pavlick

Website Coordinator – Dan Fitzgerald

Caloosahatchee Regional Coordinator – John Martin

Librarian – Jaime Knaub

Club Historian – Danny Secary

Equipment coordinator – Sanders Lewallan

We are accepting 2009 membership dues - \$20 January to January

SWFAS is getting to be known throughout the community. Several activities are planned this coming year. SWFAS has commitments with Gulf Elementary school, the Rotary Club, & Lee County Recreational Park,

2009 – 2010, SWFAS will be supporting Lee County Library for a NASA Award – Universe presentation. This event is one of 40 in the country.

There will be no meeting on Thursday, January 1st, 2009. The meeting will possibly be held on January 8th, 2009. Please refer to the newsletter or email for the exact location and date.

Bob Francis is waiting to hear from FGCU for observing at the University.

Carole Holmberg: Saturday, March 28th – There will be One Hour set for everyone to turn off their lights.

There will be Naked Eye and Telescope observing in Feldom, FL. Feldom is north of Immokalee. Carole will send out more details about this event.

Secretary – Karen Nichols – Minutes are in the newsletter.

Treasurer – Ramona Huddleston – Treasurers report read.

Librarian – Jaime – not present.

Equipment coordinator – Sanders – not present. Telescopes are available to club members to sign out and use for a 2 week period. An extension on using the equipment is possible if it is available.

Website – Dan Fitzgerald – not present.

Bob Francis – Open discussion.

Evening Program: Ms. Sabatini presented a discussion on Archeoastronomy

Meeting adjourned at 8:50.

Calendar of Events

Thursday, January 8th, 7:30 pm, **Meeting at the Calusa Nature Center, in the Iona House**

Friday, January 9th, dusk, **Observing at Eden Park Elementary in Immokalee**

Saturday, January 24, dusk, **Observing at Caloosahatchee Regional Park**

Friday, January 30th, 6-10 pm, **Observing at Christa McAuliff Elementary in Cape Coral**

Thursday, February 5th, **Meeting at the Calusa Nature Center Planetarium**

Saturday, February 21, dusk, **Observing at Caloosahatchee Regional Park**

Friday, March 6th, **Observing at Cape Coral Rotary Club**

Saturday, March 21, dusk, **Observing at Caloosahatchee Regional Park**

Southwest Florida Astronomical Society, Inc.
P.O. Box 100127
Cape Coral, FL 33910

www.theeyepiece.org