

Southwest Florida Astronomical Society SWFAS



The Eyepiece November 2008

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A MESSAGE FROM THE PRESIDENT

Mother Nature is still not providing clear skies for telescope observing. Trips down to the FAK have been far from good, but we did manage to get in an hour or so on our last trip. However, even though we did not get to do much observing, we did have a number of members from our club and also from the Naples club who came down. This made for an enjoyable evening talking to everyone and getting caught up on what everyone has been doing, and who is planning on going to the Winter Star Party next year.

It seems that the people at the Southern Cross Astronomical Society who put on the Winter Star Party are having some problems cashing checks and sending out the tickets that everyone is waiting for. Apparantly they can only deposit 100 checks each month, and after that their bank charges them additional fees. They are going to post on their web site (SCAS.org) a list of names for everyone who has, or will, receive tickets. This should enable people to make additional travel arrangements once their name appears on the list.

Planets in the evening sky for November consist of Venus (in the southwest), Jupiter (in the south), and Uranus (in the southeast). Mercury (in the east), and Saturn (in the southeast) can be viewed in the morning sky. We can look for the Southern Taurid meteor shower on November 5th, and the Leonids meteor shower on November 17th. The Leonids are usually a top meteor shower, but this year observers will have to deal with a bright gibbous moon.

I would like to extend our sincere sympathy and condolences to our Secretary, Karen Nichols and her family. Karen's brother recently passed away.

November Meeting

Our November meeting will be at the Calusa Nature Center Planetarium at 7:30 pm on Thursday, November 6th. For our program, we will be watching a DVD about the 2008 Winter Star Party. We will also be setting up telescopes in the back of the Planetarium for some observing, weather permitting. Any member who would like to bring a telescope to help out with the observing would be appreciated.

What's Up? From the Saturn Observation Campaign



The full moons of September, October and November are well represented in mythology and folklore for good reason. The full moons of the autumn helped the farmers and the hunters, providing extra light right after sunset. Usually the moon rises about 45 minutes later each night, but in the fall, the time of moonrise each night near the full moon is shorter - about 30 minutes later each night. This is due to where the ecliptic's angle is with respect to the horizon. In November, look for the full pumpkin moon rising on the 13th, and then enjoy the view for a few nights to follow.

Speaking of pumpkins reminds me of Halloween, and there is a very special view of the moon on October 31st. You can show your trick or treaters a slender crescent moon below brilliant Venus early in the evening. Look low in the west just as soon as the sun sets. Above and to the left of the moon and Venus is Jupiter, King of the planets. Jupiter will be visible for several hours, long enough to wow the kids.

You can download a star chart for Halloween Night here, along with this month's What's Up Podcast: <http://education.jpl.nasa.gov/amateurastronomy/>

The newly designed JPL website features a great Multimedia page where you'll find not only video, but images, podcasts, interactives and audio:

www.jpl.nasa.gov/video/index.cfm

- Jane Houston Jones, Senior Outreach Specialist, Cassini Program

Free November Sky Calendar Available Online

Several weeks before Venus and Jupiter have their spectacular conjunction of November 30-December 1, some casual sky watchers will begin to take notice by early November. To encourage sky watchers to follow the progress of the two planets, Abrams Planetarium at Michigan State University has put its November 2008 Sky Calendar online. The calendar features illustrations of Venus and Jupiter and surrounding stars in the southwestern sky for the evenings of November 1-3 (when the Moon passes through the same part of the sky), November 10, 15, 18, 20, 22, 26, 28-30, as well as the planets' spectacular compact gathering with the Moon on December 1. The web address for downloading the November 2008 Sky Calendar is:
www.pa.msu.edu/abrams/skycalendar

Also accessible on that page are links to an evening sky map for November, and to a summary of sky events for unaided eye and telescope during the rest of 2008 and the International Year of Astronomy 2009.

If you would like to distribute copies, at public skywatching sessions for example, all three pages may be freely reprinted.

- Robert Victor, Editor of Sky Calendar, rvictormi@earthlink.net

Celestial Highlights 2008 -2009

Following is a brief description of a several visually attractive events as well as scenarios that Galileo witnessed.

During November 2008, you won't fail to notice two brilliant "stars," actually Venus and Jupiter, in the southwestern sky at dusk. As the month progresses, the gap between the two planets will narrow until they appear closest to each other on Sunday, November 30, the close of Thanksgiving weekend. And on the next evening, Monday, December 1, the crescent Moon will join Venus and Jupiter in a spectacular compact gathering of the three brightest objects in the night sky.

Jupiter and elusive Mercury team up during Dec. 27-Jan. 5, with the crescent Moon nearby on the 29th and 30th. New Year's Eve is good too, with the Moon again near Venus, and Mercury-Jupiter forming a close pair to their lower right.

Feb. 25 and Apr. 25 at dusk will provide opportunities to see a very thin young crescent Moon, about one day past New. At dusk on Feb. 27 and at dawn on Apr. 22, the Moon will appear exceptionally close to Venus, even covering it on the morning of April 22. Sky watchers will note Venus dropping quickly in the west in March 2009, departing after Saturn has appeared in the eastern sky, so both planets will be seen simultaneously. Mercury has a good evening appearance in late April. Jupiter appears at opposition (away from the Sun from Earth's vantage point) in the ESE at dusk in August, before Saturn disappears in the west. Saturn's rings are then nearly edgewise, similar to what puzzled Galileo in 1613.

Other telescopic observations that connect us to Galileo include the satellites of Jupiter (evenings in autumn 2008, and beginning again in summer 2009) and the phases of Venus (most impressive when Venus is a crescent, in the evening sky from January well into March 2009, and mornings, even in daylight, from April until mid-June).

- Robert Victor, Editor of Sky Calendar, rvictormi@earthlink.net

NASA Working to Make Remotes on Hubble Space Telescope

Plans are under way at NASA to restart and repair the stream of scientific data being received from the Hubble Space Telescope.

Three weeks ago, circuitry problems occurred in the world's best known space observatory. This revival plan has been hailed by NASA officials as an unprecedented switch-over, and work began on Oct. 15. NASA had hoped to have the space telescope operational on Oct. 17. However, glitches occurred in the revival plan and the sending of images from the telescope back to Earth hasn't resumed. Hubble's Science Instrument Control and Data Handling (SIC&DH) system went down Sept. 27. This is the telescope's on-board computer that coordinates commands to the various instruments, and then downlinks the scientific data to the ground.



The revival plan was planned to be conducted by remote control, from Hubble's operations center on the Goddard campus in Maryland. Operators there will switch the telescope's command and data handling system from the present channel, known as Side A, to a backup channel, named Side B. NASA estimated that it would take 40 to 50 people to work on the process.

As of press time, NASA has released no further details, except to say that last month's glitch aboard the telescope has forced the postponement of the shuttle

Atlantis' servicing mission to space observatory. They had originally scheduled the Atlantis' mission for Oct. 14. However, it has now been postponed until next February at the earliest date.

Officials are thankful that the system was built with a fully repeating backup channel, which was designed to come online in the event that the original side ever failed to operate. It is now just a logistical session to switch to the backup channel, involving sending comprehensive software commands up to the telescope to essentially take control of Hubble's suite of telescopes and other sensors through the backup channel. When Hubble's on-board control system went down, many of the instruments went into safe mode and team members must now downlink data and check it with older Side A samples to make sure that the backup channel is performing according to expectations. The electronic components on the backup channel have never been used in Hubble's 18 years of operation. Officials were uncertain if the components would even work and return the telescope to operating condition. The Atlantis upgrade will involve the installation of two new instruments and officials are hoping to be able to repair two other instruments onboard the telescope at that time. The plan is for the telescope to continue to operate via Side B.

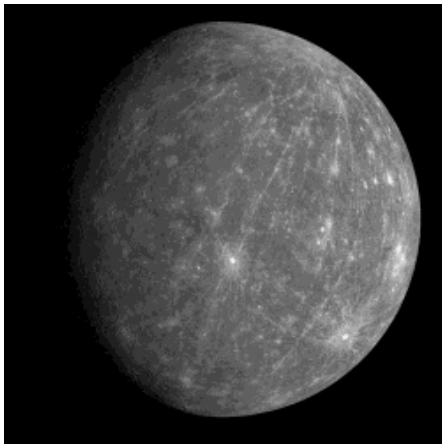
If the switch-over to the backup channel fails, the original design team built a SIC&DH system. The backup system has been housed at Goddard for the past 20 years.

– *By Nicholas W. Inman, Published: October 27, 2008, Marshfieldmail.com*

MESSENGER Reveals Mercury as Never Seen Before

When Mariner 10 flew past Mercury three times in 1974 and 1975, the probe imaged less than half the planet. In January, during MESSENGER's first flyby, its cameras returned images of about 20 percent of the planet's surface missed by Mariner 10. In October, MESSENGER successfully completed its second flyby of Mercury, and its cameras captured more than 1,200 high-resolution and color images of the planet – unveiling another 30 percent of Mercury's surface that had never before been seen by spacecraft.

"The MESSENGER team is extremely pleased by the superb performance of the spacecraft and the payload," said MESSENGER Principal Investigator Sean Solomon. "We are now on the correct trajectory for eventual insertion into orbit around Mercury, and all of our instruments returned data as planned from the side of the planet opposite to the one we viewed during our first flyby. When these data have been digested and compared, we will have a global perspective of Mercury for the first time."



This spectacular image – one of the first to be returned – was snapped by the Wide Angle Camera (WAC), part of the Mercury Dual Imaging System (MDIS) instrument, about 90 minutes after MESSENGER's closest approach to Mercury, when the spacecraft was at a distance of about 17,000 miles.

The bright crater just south of the center of the image is Kuiper, identified on images from the Mariner 10 mission in the 1970s. For most of the terrain east of Kuiper, toward the edge of the planet, the departing images are the first spacecraft views of that portion of Mercury's surface. A striking characteristic of this newly imaged area is the large pattern of rays that extend from the northern region of Mercury to regions south of Kuiper.

This WAC image is one in a sequence of 55: a five-frame mosaic with each frame in the mosaic acquired in all 11 of the WAC filters. This portion of Mercury's surface was previously imaged under different lighting conditions by Mariner 10, but this new MESSENGER image mosaic is the highest-resolution color imaging ever acquired of any portion of Mercury's surface.



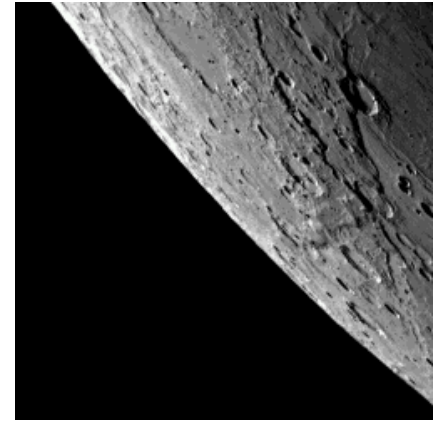
Additionally, some of the images in this mosaic overlap with flyby data acquired by the Mercury Atmospheric and Surface Composition Spectrometer and Mercury Laser Altimeter instruments, resulting in the first time that these three instruments have gathered data of the same area of Mercury. The combination of these three datasets will enable unprecedented studies of this region of Mercury's surface.



This image, acquired about 89 minutes before the craft's closest approach to Mercury, resembles the optical navigation images taken leading up to the flyby. The resolution of this image is somewhat better than that obtained by the final optical navigation image set, and the surface visible is newly imaged terrain that was not previously seen by either Mariner 10 or during MESSENGER's first flyby.

However, the added resolution is not the main scientific advancement that will be provided by this image. The image was one of 11 viewed through different narrow-band color filters, the set of which will enable detailed color studies of this newly imaged area. In addition, the Narrow Angle Camera (NAC) acquired a high-resolution mosaic of most of this thin crescent view of Mercury at a resolution better than 0.3 miles/pixel that will enable the MESSENGER team to explore this newly imaged region of Mercury's surface in more detail.

About 58 minutes before MESSENGER's closest approach to Mercury, the NAC captured this close-up image of a portion of Mercury's surface imaged by spacecraft for the first time. It is one of 44 in a high-resolution NAC mosaic taken of the approaching crescent-shaped Mercury, as seen at lower resolution in the optical navigation images and the approach WAC color image set.



As the MESSENGER examines this newly obtained view, data from the flyby continue to stream down to Earth, including higher resolution close-up images of this previously unseen terrain. Collectively, these images and measurements made by other MESSENGER instruments will soon provide a broad range of information for understanding the formation and geologic history of the innermost planet.

Additional information and features from this encounter will be available online at http://messenger.jhuapl.edu/mer_flyby2.html, so check back frequently to see the latest released images and science results!

- from *MESSENGER E-News*

Some Strange and Mildly Funny Space Stuff

http://www.theonion.com/content/video/astronaut_suspects_nasa_using_him

http://www.theonion.com/content/video/china_launches_first_willing

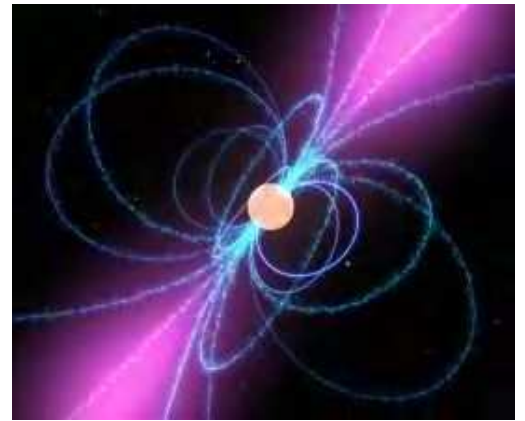
-from *The Onion*

Discovered: A New Kind of Pulsar

About three times a second, a 10,000-year-old stellar corpse sweeps a beam of gamma-rays toward Earth. Just discovered by NASA's Fermi Gamma-ray Space Telescope, the object, called a pulsar, is the first one known that "blinks" in pure gamma rays.

"This is the first example of a new class of pulsars," says Peter Michelson, principal investigator for Fermi's Large Area Telescope. "[We think] it will give us fundamental insights into how these collapsed stars work."

Right: An artist's concept of the newly discovered pulsar. Clouds of charged particles move along the pulsar's magnetic field lines (blue) and create a lighthouse-like beam of gamma rays (purple).



Pulsars were first discovered in 1967 by student radio astronomer Jocelyn Bell and her thesis advisor Tony Hewish. The radio pulses they recorded were uncannily steady--so much so that some astronomers wondered if they were picking up signals from extraterrestrial civilizations. The correct explanation was even stranger: Pulsars are spinning neutron stars packing the mass of the sun into a sphere about 20 km across. Whirling around thousands of times each hour, they beam radio pulses into the cosmos in the style of a rapidfire lighthouse.

Since then, about 1800 pulsars have been discovered mainly via their radio emission. A fraction of pulsars go beyond radio; they also emit pulses of visible light, X-rays, and even high-energy gamma-rays. This discovery by Fermi is different because it is a purely gamma-ray pulsar. The star is silent across parts of electromagnetic spectrum where pulsars are normally found and hints at a whole population of previously unsuspected pulsars waiting to be picked out of the heavens.

The gamma-ray-only pulsar lies within a supernova remnant known as CTA 1 located about 4,600 light-years away in the constellation Cepheus. Its lighthouse-like beam sweeps Earth's way every 316.86 milliseconds. The pulsar, which formed in a supernova explosion about 10,000 years ago, emits 1,000 times the energy of our sun.

"The Large Area Telescope provides us with a unique probe of the galaxy's pulsar population, revealing objects we would not otherwise even know exist," says Fermi project scientist Steve Ritz of the Goddard Space Flight Center.

The pulsar in CTA 1 is not located at the center of the supernova's expanding gaseous shell. Supernova explosions can be asymmetrical, often imparting a "kick" that sends the neutron star careening through space. Based on the remnant's age and the pulsar's distance from its center, astronomers believe the neutron star is moving at about a million miles per hour -- a typical speed for neutron stars.

Fermi's Large Area Telescope scans the entire sky every three hours and detects photons with energies ranging from 20 million to more than 300 billion times the energy of visible light.

"This observation shows the power of the Large Area Telescope," Michelson adds. "It is so sensitive that we can now discover new types of objects just by observing their gamma-ray emissions."

A paper about the new pulsar appears in the Oct. 16 edition of *Science Express*.

- from *Science@NASA*, Editor Dr. Tony Phillips

Our Vanishing Night: Most City Skies Have Become Virtually Empty of Stars

If humans were truly at home under the light of the moon and stars, we would go in darkness happily, the midnight world as visible to us as it is to the vast number of nocturnal species on this planet. Instead, we are diurnal creatures, with eyes adapted to living in the sun's light. This is a basic evolutionary fact, even though most of us don't think of ourselves as diurnal beings any more than we think of ourselves as primates or mammals or Earthlings. Yet it's the only way to explain what we've done to the night: We've engineered it to receive us by filling it with light.

This kind of engineering is no different than damming a river. Its benefits come with consequences—called light pollution—whose effects scientists are only now beginning to study. Light pollution is largely the result of bad lighting design, which allows artificial light to shine outward and upward into the sky, where it's not wanted, instead of focusing it downward, where it is. Ill-designed lighting washes out the darkness of night and radically alters the light levels—and light rhythms—to which many forms of life, including ourselves, have adapted. Wherever human light spills into the natural world, some aspect of life—migration, reproduction, feeding—is affected.

For most of human history, the phrase "light pollution" would have made no sense. Imagine walking toward London on a moonlit night around 1800, when it was Earth's most populous city. Nearly a million people lived there, making do, as they always had, with candles and rushlights and torches and lanterns. Only a few houses were lit by gas, and there would be no public gaslights in the streets or squares for another seven years. From a few miles away, you would have been as likely to smell London as to see its dim collective glow.

Now most of humanity lives under intersecting domes of reflected, refracted light, of scattering rays from overlit cities and suburbs, from light-flooded highways and factories. Nearly all of nighttime Europe is a nebula of light, as is most of the United States and all of Japan. In the south Atlantic the glow from a single fishing fleet—squid fishermen luring their prey with metal halide lamps—can be seen from space, burning brighter, in fact, than Buenos Aires or Rio de Janeiro.

In most cities the sky looks as though it has been emptied of stars, leaving behind a vacant haze that mirrors our fear of the dark and resembles the urban glow of dystopian science fiction. We've grown so used to this pervasive orange haze that the original glory of an unlit night—dark enough for the planet Venus to throw shadows on Earth—is wholly beyond our experience, beyond memory almost. And yet above the city's pale ceiling lies the rest of the universe, utterly undiminished by the light we waste—a bright shoal of stars and planets and galaxies, shining in seemingly infinite darkness.

We've lit up the night as if it were an unoccupied country, when nothing could be further from the truth. Among mammals alone, the number of nocturnal species is astonishing. Light is a powerful biological force, and on many species it acts as a magnet, a process being studied by researchers such as Travis Longcore and Catherine Rich, co-founders of the Los Angeles-based Urban Wildlands Group. The effect is so powerful that scientists speak of songbirds and seabirds being "captured" by searchlights on land or by the light from gas flares on marine oil platforms, circling and circling in the thousands until they drop. Migrating at night, birds are apt to collide with brightly lit tall buildings; immature birds on their first journey suffer disproportionately.

Insects, of course, cluster around streetlights, and feeding at those insect clusters is now ingrained in the lives of many bat species. In some Swiss valleys the European lesser horseshoe bat began to vanish after streetlights were installed, perhaps because those valleys were suddenly filled with light-feeding pipistrelle bats. Other nocturnal mammals—including desert

rodents, fruit bats, opossums, and badgers—forage more cautiously under the permanent full moon of light pollution because they've become easier targets for predators.

Some birds—blackbirds and nightingales, among others—sing at unnatural hours in the presence of artificial light. Scientists have determined that long artificial days—and artificially short nights—induce early breeding in a wide range of birds. And because a longer day allows for longer feeding, it can also affect migration schedules. One population of Bewick's swans wintering in England put on fat more rapidly than usual, priming them to begin their Siberian migration early. The problem, of course, is that migration, like most other aspects of bird behavior, is a precisely timed biological behavior. Leaving early may mean arriving too soon for nesting conditions to be right.

- By Verlyn Klinkenborg

<http://ngm.nationalgeographic.com/2008/11/light-pollution/klinkenborg-text/1>

The Space Place



The Chemical Weather Report

by Dr. Tony Phillips

"Sunny tomorrow with highs in the mid-70s. There's going to be some carbon monoxide blowing in from forest fires, and all that sunshine is predicted to bring a surge in groundlevel ozone by afternoon. Old and young people and anyone with lung conditions are advised to stay indoors between 3 and 5 p.m."

Whoever heard of a weather report like that?

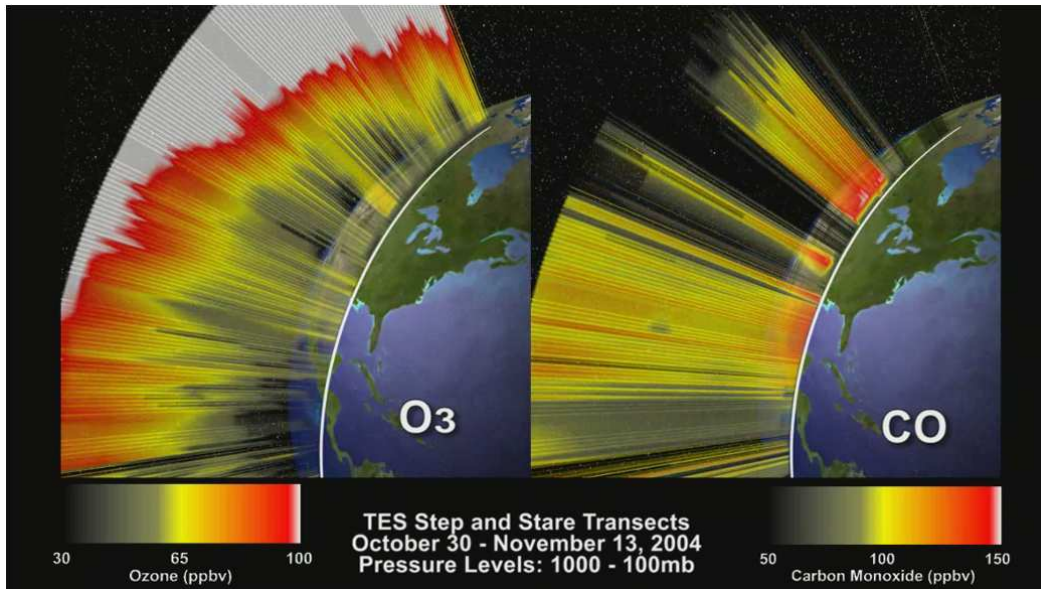
Get used to it. Weather reports of the future are going to tell you a lot more about the atmosphere than just how warm and rainy it is. In the same way that satellite observations of Earth revolutionized basic weather forecasting in the 1970s and 80s, satellite tracking of air pollution is about to revolutionize the forecasting of air quality. Such forecasts could help people plan around high levels of ground-level ozone—a dangerous lung irritant—just as they now plan around bad storms.

"The phrase that people have used is chemical weather forecasting," says Kevin Bowman of NASA's Jet Propulsion Laboratory. Bowman is a senior member of the technical staff for the Tropospheric Emission Spectrometer, one of four scientific sensors on NASA's Aura satellite.

Aura and other NASA satellites track pollution in the same way that astronomers know the chemical composition of stars and distant planetary atmospheres: using spectrometry. By breaking the light from a planet or star into its spectrum of colors, scientists can read off the atmosphere's gases by looking at the "fingerprint" of wavelengths absorbed or emitted by those chemicals. From Earth orbit, pollution-watching satellites use this trick to measure trace gases such as carbon monoxide, nitrogen oxide, and ozone.

However, as Bowman explains, "Polar sun-synchronous satellites such as Aura are limited at best to two overpasses per day." A recent report by the National Research Council recommends putting a pollution-watching satellite into geosynchronous orbit—a special very high-altitude orbit above the equator in which satellites make only one orbit per day, thus seeming to hover over the same spot on the equator below. There, this new satellite, called GEOCAPE (Geostationary Coastal and Air Pollution Events), would give scientists a continuous eye in the sky, allowing them to predict daily pollution levels just as meteorologists predict storms.

"NASA is beginning to investigate what it would take to build an instrument like this," Bowman says. Such a chemical weather satellite could be in orbit as soon as 2013, according to the NRC report. Weather forecasts might never be the same. Learn more about the Tropospheric Emission Spectrometer at tes.jpl.nasa.gov. Kids can learn some elementary smog chemistry while making "Gummy Greenhouse Gases" out of gumdrops at spaceplace.nasa.gov/en/kids/tes/gumdrops.



Caption:
Example of visualization of data from the Tropospheric Emission Spectrometer. These frames are from an animation that steps through transects of the atmosphere profiling vertical ozone and carbon monoxide concentrations, combining all tracks of the Aura satellite during a given two week period.

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



Get ready to join amateur astronomers from all over the world in commemorating the International Year of Astronomy- IYA 2009. The Night Sky Network has a goal of reaching one million people next year! It sounds ambitious, but that works out to just four people a month if all of our club members participate. Together we can do it and here is what we are planning.

Let's show a million people the stars!

The Night Sky Network, ASP, NASA, and the IYA USA committee are teaming up to provide you with:

- Monthly IYA Discovery Guides - complete with articles, activities, and finder charts
- A fully searchable online database of Night Sky Network activities and other astronomy resources, many accompanied by online videos
- A calendar of worldwide and nationwide astronomy events for your club
- Ways to get more of your club members involved
- Free NASA handouts to active NSN clubs
- Monthly telecons for NSN members on the monthly IYA Themes
- And more goodies for your club throughout the year

On October 31st, these resources will be unveiled. Watch for the announcement. You can preview the January IYA Discovery Guide here:

http://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=300

Join amateur astronomers around the globe as together we connect millions with the universe. It has been 400 years since Galileo first pointed his telescope to the sky and opened up a whole

new universe to us. Share the excitement of Galileo's discoveries and engage your visitors in this worldwide celebration. One Earth. One Sky. Share the discovery!

November Telecon with Sue Ann Heatherly

Save Tuesday, November 18th for our next teleconference: "How to make an Itty Bitty (sidewalk) Radio Telescope" with speaker Sue Ann Heatherly. Ms. Heatherly is the Education Officer of the National Radio Astronomy Observatory (NRAO) at Green Bank, West Virginia. Sue Ann has been with the NRAO since 1989.

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

Send Your Name Around the Earth

NASA invites you to submit your name to be included on a microchip that will be rocketed into space as part of NASA's Glory Mission, scheduled to launch in June 2009. Glory is the first mission dedicated to understanding the effects of particles in the atmosphere and the sun's variability on Earth's climate.

The "Send Your Name Around the Earth" Web site enables anyone to take part in the science mission and place his or her name in orbit for years to come. Participants will receive a printable certificate from NASA.

The deadline for submitting names is Nov. 1, 2008.

To submit names, visit <http://polls.nasa.gov/utilities/sendtospace/jsp/sendName.jsp> .

To learn more about the Glory mission, visit <http://glory.gsfc.nasa.gov/>.

SWFAS Minutes – October 2, 2008

7:30 – Bob Francis – President: Bob called the meeting to order.

Welcome to new members and visitors.

Mentioned Steve Nelson and his dedication to SWFAS over the years. His accomplishments include getting SWFAS IRS approval of non-profit organization status. Supported all SWFAS events, was Treasurer for two years, and was Coordinator for SWFAS star parties at Caloosahatchee Regional Park.

SWFAS member Jon Martin volunteered to take over as Coordinator for star parties at Caloosahatchee Regional Park.

Bob reminded everyone that in December we will be holding elections for the four officers to serve in 2009. Bob asked for a volunteer to perform the financial audit that must be done prior to election of new officers.

Stew Rorer volunteered to perform the financial audit.

Bob brought everyone up to date on the restoration of the Calusa Nature Center's 12-inch Newtonian telescope that he and Stewart Rorer are working on.

Mike Harden – Vice President: Not present.

Ramona Huddleston – Treasurer: Not present.

Karen Nichols – Secretary: Not present due to family emergency.

Bob informed everyone that he is working on getting the club insurance. Charlie Paul recommended that we get insurance and he gave Bob information about the insurance company that the Everglades Astronomical Society uses.

Carole Holmberg updated everyone on the new equipment that the Calusa Nature Center and Planetarium has purchased. Equipment should be in after the first of the year.

Charlie Paul & Chuck Pavlick told everyone that viewing at the FAK has been cloudy and bad.

Stewart Rorer informed everyone about the Observer Handbook that is being offered for \$20 instead of \$30. Stewart said he gets the book every year and finds it very convenient. Anyone interested can contact him.

Carole Holmberg held a drawing for two items.

Evening Program: Carole Holmberg presented a program entitled "The Planets".

Meeting adjourned at 9:30 PM.

Calendar of Events

Thursday, November 6th, 7:30 pm, **Meeting at the Calusa Nature Center Planetarium**

Friday, November 7th, **Telescope Observing at Calusa Nature Center and Planetarium**
(SWFAS members are welcome to join us. Contact Carole at 275-3435 for more information)

Friday, November 14th, proposed launch for Space Shuttle Endeavor

Saturday, November 22nd, sunset, **Telescope Observing at Caloosahatchee Regional Park**

Thursday, December 4th, 7:30 pm, **Meeting at the Calusa Nature Center Planetarium**

Southwest Florida Astronomical Society, Inc.
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www.theeyepiece.org