Southwest Florida Astronomical Society
SWFAS

The Eyepiece
January 2013

A MESSAGE FROM THE PRESIDENT

I hope everyone is having a Happy New Year!

At the December meeting we elected the officers for 2013. While most positions remained the same, I would like to thank Lee Kraemer for taking over the Secretary position. I would also like to thank Kathleen Hendrix for her service in that position.

This month's meeting on Jan. 3rd at 7:30 pm will be at the FGCU Observatory, not at the Calusa Nature Center Planetarium. Dr. Fauerbach and crew will be handling the presentation. Please meet outside of the observatory building.

The star party at the CRP on Dec. 15th was a real nice night. We had a great turnout with 3 C-11's and 4 C-8's plus a wide variety of other equipment present!

The Gulf Middle observing night had a good turnout despite the clouds. We had a lucky 20 min window just as the indoor events were winding down and showed Jupiter to a large number of people.

Upcoming Meetings: February 7th – 7:30 pm at the Calusa Nature Center Planetarium. Program to be determined.

Moon: Jan Last Quarter 4th, New 11th, 1st Quarter 18th, Full 26th
Feb Last Quarter 3rd, New 10th, 1st Quarter 17th, Full 25th.

Planets: Mars is very low in the west at sunset. Saturn is high in the predawn sky. Jupiter is high in Taurus at sunset. Venus is still shining bright in the morning sky. By the end of the month, Mercury is too close to the sun to observe. We are rapidly losing the outer planets into the sunset.

Dues for 2013 are now due. If you recently joined after September, your dues were applied to 2013. I will send out email notifications to all members who have not already paid. Please pay at the meetings or events we are holding or send your payment in to SWFAS, P.O. Box 100127, Cape Coral, Florida 33910. If you have any questions about your dues, contact me.

Club Positions

President:
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Vacant

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Upcoming Events

- Thurs Jan 3rd Monthly meeting at FGCU, 7:30 pm Please note the change in location for this meeting!
- Fri Jan 4th "The Night Sky at Big Cypress" Public Observing at Big Cypress National Preserve (Ochopee), 7pm
- Sat Jan 12th Orion Event/Telescope observing at Calusa Nature Center, 7:30 – 9pm (contact Carol Stewart)
- Sat Jan 12th Star Party at Caloosahatchee Regional Park, dusk
- Fri Jan 18th Christa McAuliffe Charter School Evening Observing (1st quarter moon)
- Tues Jan 22nd & Wed Jan 23rd Telescope observing at Pelican Elementary School in Cape Coral, 6:30-8:00pm (contact Carol Stewart)
- Sat Jan 26th Telescope observing at the Calusa Nature Center for CNCP's 'Wine Under the Stars,' 6:30-9:00pm (contact Carol Stewart)
- Sat Feb 2nd Thomas A. Edison Kiwanis Science and Engineering Fair at FGCU, 10am – 4 pm. The Science Fair is now separate from the Edison Day of Discovery.
- Sat Feb 2nd 10th Annual Dark Sky Festival in Harmony, FL (S of Orlando), 5 pm-10pm
- Thurs Feb 7th Monthly meeting at the Calusa Nature Center Planetarium, 7:30pm
- Sat Feb 9th Star Party at Caloosahatchee Regional Park, dusk
- Fri Feb 15th Star Party at Rotary Park, Cape Coral Parks and Rec, dusk
- Sat Feb 23rd Burrowing Owl Festival, Rotary Park Cape Coral, 10am-4pm
- Sat Feb 23rd Edison Festival Day of Discovery, Imaginarium, 10am-4pm

January Meeting

Our January monthly meeting will be held on Thursday January 3rd at 7:30 pm at FGCU. We will gather outside the Egan Observatory. Professor Michael Fauerbach will be our host. Please note that we will not be meeting at the Calusa Nature Center Planetarium in January. Directions and a map of the FGCU campus are located at this website: www.fgcu.edu/Admissions/Prospective/maincampusdirections.html . The observatory

itself is not labeled on the map, but it is a small building just south of Whitaker Hall.

CRP Star Party Schedule

The 2013 Caloosahatchee Regional Park schedule has now been set. Star Parties for 2013 will be January 12, February 9, March 9, April 13, May 11, June 8, July 6, August 3, September 13, October 5, November 2, November 30, and December 28.

Upcoming Big Cypress National Preserve Astronomy Program

My name is Luke Gommermann and I am a Park Ranger in Interpretation and Environmental Education at Big Cypress National Preserve. A fellow intern, Cassie Branstetter and I are developing a program entitled *The Night Sky of Big Cypress*. It will be held at January 4, 2013 at 7 PM behind our Welcome Center. The evening will begin with an interpretive program lasting ~30 minutes where we will discuss historical legends and more recent scientific findings of easily observed sky features, such as Orion, Jupiter, the Big Dipper and Polaris, and possibly a few others depending on time available. We are also hoping to catch the beginnings of the Quadrantids meteor shower. This will be followed (~7:30 pm) by viewing objects through our telescope, an Orion Skyquest XT8.

I would like to invite your organization or any of your members to join us if they are interested. You would be welcome to bring any viewing instruments you like, provided that you allow our visitors to participate in your observations. Feel free to reply if you have any additional questions, comments, or suggestions regarding our event. Thank you for your time.

- Luke Gommermann, luke_gommermann@nps.gov

Opportunities to Assist with Telescopes at Calusa Nature Center

It would be greatly appreciated if you would like to assist with telescope observing on the following nights:

Saturday, January 12th, 7:30-9:00 PM at the planetarium for a program about the constellation Orion. I will present a 'short' program about Orion in the theater and then we'll go outside to look at the Orion Nebula, compare star colors of Rigel and Betelgeuse, and generally just look at what the constellation offers.

Tuesday and Wednesday, January 22nd and 23rd, 6:30-8:00 PM at Pelican Elementary School in Cape Coral—general observing with students and parents.

Saturday, January 26th, 6:30-9:00 PM at the planetarium for CNCP's 'Wine Under the Stars' event. This event is a fundraiser for the Nature Center in collaboration with the North Fort Myers Rotary club.

Thank you so much, in advance, for any assistance you can provide for any of these events.

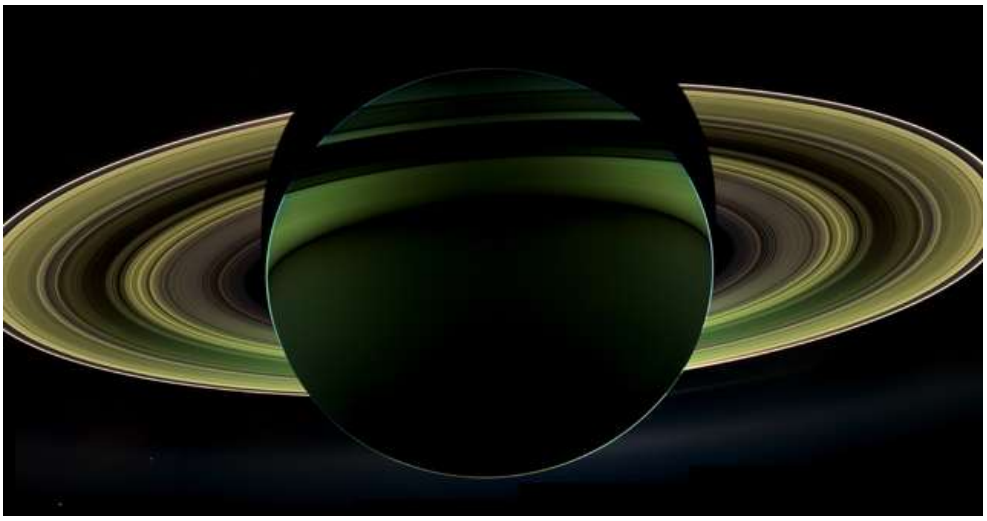
- Carol Stewart, cjstewart@mindspring.com

10th Annual Dark Sky Festival at Harmony

My name is Nick Deacon and I am writing on behalf of the Town of Harmony to inform you of our Dark Sky Festival taking place on February 2nd, 2013. The Dark Sky Festival raises awareness of the importance of dark skies for astronomy and wildlife. We offer a variety of educational sessions and activities on space and science in general. Astronomers of all ages and proficiency have had a great time while learning a thing or two at the Dark Sky Festival in years past. With special guests from NASA, former astronauts, telescopes available to scan the heavens, planetarium shows, and more, this festival has made its mark on the Central Florida area. This 10th year of the Dark Sky

Festival will bring more special guests, lots of surprises and interactive activities like never before.
To make this event successful, we would appreciate your help. If your group would be interested, we would love to have you assist us during the actual event. Each year we set up a telescope field where clubs from around the state bring in their telescopes and allow attendees to view the stars and inform them on how to find specific ones. This year we are expecting around 8,000 attendees and therefore need more clubs to help. We have camping available in our star field for after the event and I'm sure your members would have a blast at the festival.
Date/Time: February 2nd, 2013/5:00pm-10:00pm
Location: Town of Harmony Square (3500 Harmony Square Drive West, Harmony, FL 34773)
- Nick Deacon, ndeacon@harmonyfl.com, 786-239-2590, eventsatharmony.com

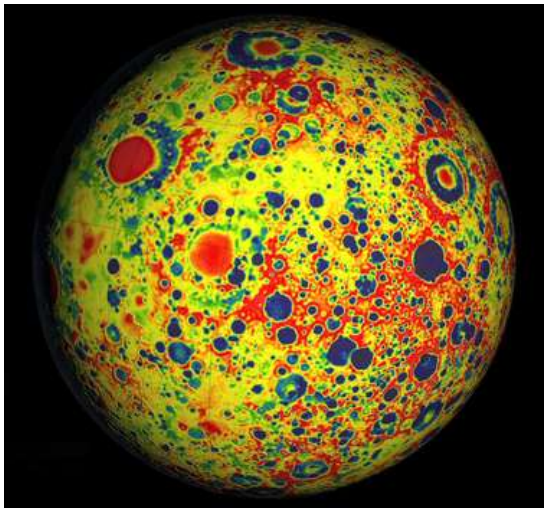
From Cassini for the Holidays: A Splendor Seldom Seen



NASA's Cassini spacecraft, in orbit around Saturn for more than 8 years, has delivered another glorious, backlit view of the planet Saturn and its rings.
On Oct. 17, 2012, during its 174th orbit around the gas giant, Cassini was positioned within Saturn's shadow, a perfect location from which to look in the direction of the sun and take a backlit view of the rings and the dark side of the planet. Looking back towards the sun is a geometry referred to by planetary scientists as *high solar phase*; near the center of your target's shadow is the highest phase possible. This is a very scientifically advantageous and coveted viewing position, as it can reveal details about both the rings and atmosphere that cannot be seen in lower solar phase.
The last time Cassini had such a perspective on Saturn and its rings was in September 2006, when it captured a mosaic, processed to look like natural color, entitled *In Saturn's Shadow* (http://photojournal.jpl.nasa.gov/catalog/?IDNumber=PIA08329). In that mosaic, planet Earth put in a special appearance, making *In Saturn's Shadow* one of the most popular Cassini images to date.
The new mosaic does not contain Earth; along with the sun, our planet is hidden behind Saturn. However, it was taken when Cassini was closer to Saturn and therefore shows more detail in the rings than the one taken in 2006.
The new processed mosaic, composed of 60 images, can be found at www.nasa.gov/cassini.
- www.jpl.nasa.gov/news/news.php?release=2012-402&cid=release_2012-402

GRAIL Creates Most Accurate Moon Gravity Map
Lunar Impact Site Named for Astronaut Sally Ride

Twin NASA probes orbiting Earth's moon have generated the highest resolution gravity

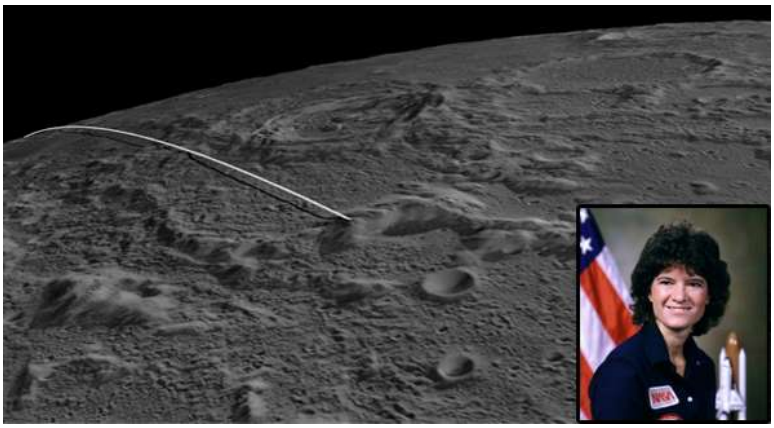


field map of any celestial body. The new map, created by the Gravity Recovery and Interior Laboratory (GRAIL) mission, allows scientists to learn about the moon's internal structure and composition in unprecedented detail. Data from the two washing machine-sized spacecraft also will provide a better understanding of how Earth and other rocky planets in the solar system formed and evolved.

The gravity field map reveals an abundance of features never before seen in detail, such as tectonic structures, volcanic landforms, basin rings, crater central peaks and numerous simple, bowl-shaped craters. Data also show the moon's gravity field is unlike that of any terrestrial planet in our solar system.

The probes revealed the bulk density of the moon's highland crust is substantially lower than generally assumed. This low-bulk crustal density agrees with data obtained during the final Apollo lunar missions in the early 1970s, indicating that local samples returned by astronauts are indicative of global processes.

"With our new crustal bulk density determination, we find that the average thickness of the moon's crust is between 21-27 miles, which is about 6-12 miles thinner than previously thought," said Mark Wieczorek, GRAIL investigator. "With this crustal thickness, the bulk composition of the moon is similar to Earth. This supports models where the moon is derived from Earth materials that were ejected during a giant impact event early in solar system history."



On December 17, the two spacecraft comprising GRAIL impacted on a mountain near the moon's north pole at a speed of 3,760 mph. The probes intentionally were sent into the lunar surface because they did not have sufficient altitude or fuel to continue science operations. The location of the Sally K. Ride Impact Site is on the southern face of an approximately 1.5-mile-tall mountain near a crater named Goldschmidt.

NASA named the site in honor of the late astronaut Sally K. Ride, who was America's first woman in space and a member of the probes' mission team. Ride, who died in July after a 17-month battle with pancreatic cancer, led GRAIL's MoonKAM (Moon Knowledge Acquired by Middle School Students) Program through her company, Sally Ride Science. Along with its primary science instrument, each spacecraft carried a MoonKAM camera that took more than 115,000 total images of the lunar surface. Imaging targets were proposed by middle school students from across the country and the resulting images returned for them to study.

Fifty minutes prior to impact, the spacecraft fired their engines until the propellant was depleted. The maneuver was designed to determine precisely the amount of fuel remaining in the tanks. This will help NASA engineers validate computer models to improve predictions of fuel needs for future missions.

- www.jpl.nasa.gov/news/news.php?release=2012-401&cid=release_2012-401 and www.jpl.nasa.gov/news/news.php?release=2012-385&cid=release_2012-385

Nine Impact Craters on Mercury Recently Named

The International Astronomical Union (IAU) recently assigned names to nine impact craters on Mercury. The IAU has been the arbiter of planetary and satellite nomenclature since its inception in 1919. In keeping with the established naming theme for craters on Mercury, all the newly designated features are named after deceased artists, musicians, authors, or other contributors to the humanities. The newly named craters are:

Catullus for Gaius Valerius Catullus (ca. 84 BC - ca. 54 BC), a Latin poet of the Republican period.

Disney for Walter Elias "Walt" Disney (1901-1966), an American film maker, actor, and animator who co-founded Walt Disney Productions.

Hopper for Edward Hopper (1882-1967), a prominent American realist painter and printmaker, most popularly known for his oil paintings.

Joplin for Scott Joplin (1868-1917), an African-American composer and pianist who wrote 44 original ragtime pieces, one ragtime ballet, and two operas. One of his pieces, the "Maple Leaf Rag," became ragtime's first and most influential hit.

Kobro for Katarzyna Kobro (1898-1951), a Polish sculptor who co-founded the AR ("Revolutionary Artists" or "avant-garde Actual") and revolutionized thinking about sculpture.

Komeda for Krzysztof Komeda (1931-1969), a Polish film music composer and jazz pianist best known for his work in film scores. His album *Astigmatic* is widely regarded as one of the most important European jazz albums.

Kyōsai for Kawanabe Kyōsai (1831-1889), a Japanese caricaturist who also painted pictures and sketches, often choosing subjects from the folklore of his country.

Popova for Lyubov Popova (1889-1924), a Russian painter, graphic artist, theatrical designer, applied artist, and illustrator. She painted in a Cubo-Futurist style and designed fabrics, books, and posters.

Waters for McKinley "Muddy Waters" Morganfield (1915-1983), an African-American blues musician, generally considered the father of modern "Chicago blues."

These nine newly named craters join 86 other craters named since the MESSENGER spacecraft's first Mercury flyby in January 2008. All the newly named craters can be explored interactively on a global map of Mercury, with instructions available online at http://messenger.jhuapl.edu/gallery/sciencePhotos/image.php?image_id=1053. More information about the names of features on Mercury and the other objects in the Solar System can be found at the U.S. Geological Survey's Planetary Nomenclature web site: http://planetarynames.wr.usgs.gov/index.html.

Unprecedented New Images of Earth at Night

On Dec. 5, 2012, scientists unveiled an unprecedented new look at our planet at night. A global composite image, constructed using cloud-free night images from a new National Oceanic and Atmospheric Administration (NOAA) satellite, shows the glow of natural and human-built phenomena across Earth in greater detail than ever before.

"For all the reasons that we need to see Earth during the day, we also need to see Earth at night," said Steve Miller, a researcher at NOAA. "Unlike humans, Earth never sleeps."

Many satellites are equipped to look at Earth during the day, when they can observe our planet fully illuminated by the sun. With a new sensor aboard the National Polar-orbiting Partnership (NPP) satellite, scientists now can observe Earth's atmosphere and surface during nighttime hours. The sensor, called VIIRS (Visible Infrared Imaging Radiometer Suite), is sensitive enough to detect the light from a single ship in the sea.

The day-night band of VIIRS observed Hurricane Sandy, illuminated by moonlight, making landfall over New Jersey on the evening of Oct. 29. Night images showed the widespread power outages that left millions in darkness in the wake of the storm. With its night view, VIIRS is able to detect a more complete view of storms and other weather conditions, such as fog, that are difficult to discern with infrared, or thermal, sensors. Night is also when many types of clouds begin to form.

"The night is nowhere as dark as we might think," Miller said. And with the VIIRS day-night band helping scientists to tease out information from human and natural sources of nighttime light, "we don't have to be in the dark anymore, either."

- Production editor: Dr. Tony Phillips | Credit: Science@NASA, full story at http://science.nasa.gov/science-news/science-at-nasa/2012/05dec_earthatnight/

The House That Comets Built

For many amateur astronomers, money flows in one direction—out—usually to fund acquisitions of new equipment. But at least one former amateur, Edward Emerson Barnard, famously reversed that flow. Born 155 years ago in Nashville, Tennessee, Barnard developed a love for astronomy and, despite receiving little formal schooling, he discovered five comets in the 1880s—each of which netted him a $200 prize offered by a New York philanthropist. Barnard used the money to buy a home in Nashville that became known as The Comet House. Soon thereafter, Barnard became a professional astronomer and compiled a groundbreaking photographic atlas, which conferred upon the Horsehead Nebula a new designation—Barnard 33.

- The Week in Space

Astronaut Scott Kelly Prepared for Yearlong Station Flight

When astronaut Scott Kelly told his nine-year-old daughter he was going to spend a full year aboard the International Space Station, she exclaimed, "Awesome!" When cosmonaut Mikhail Kornienko told his wife the same thing, "She started crying."

But both men said they were looking forward to blasting off in March 2015 and spending a full year in orbit, serving as medical guinea pigs to help scientists learn more about the long-term physical and psychological impacts of extended, confined flights in the weightless environment of space.

"I personally think our ultimate destination, at least for a long time in our planet's future, is getting to Mars," Kelly said. "And I look at this as a step towards that."

Alexey Krasnov, director of manned space operations for Roscosmos, the Russian federal space agency, agreed, saying through a translator, "I hope this one-year duration expedition will help us achieve these tasks."

A flight to Mars, possibly in the 2030s, is expected to take 7 to 10 months, followed by a lengthy stay in the reduced gravity of the red planet and then an equally long trip back. Space station astronauts typically spend up to six months aboard the international lab complex and researchers are eager to find out how the adaptation process might change for longer-duration missions.

The spaceflight duration record holder is cosmonaut Valery Polyakov, who spent 438 days aboard the Russian Mir space station in 1994-95. The U.S. record for the longest single spaceflight is held by astronaut Michael Lopez-Alegria, who spent 215 days aboard the International Space Station in 2006-07.

The upcoming flight with Kelly and Kornienko will set a new record for NASA and it will be the first to employ the full range of modern medical protocols and research procedures over a 12-month period.

Igor Ushakov, a senior medical researcher with the Russian space program, said astronauts already run a 7% risk of having a problem that requires medical care after a six-month flight.

"So the risk will double," he said. "I would like to knock on wood that the worst scenario won't happen. But the risk is increased, that's for sure." Even so, he reassured, "the cosmonauts who were in space for a year or more, they all are alive and well today."

Kelly said was up to the challenge, but he acknowledged it won't be easy. "My greatest concern is missing the people, your loved ones, your family, your friends on a personal level that you're attached to on the ground," he said.

Another issue: the sheer routine of life in a confined space. "You know, in the morning you wake up, you're at work. When you go to sleep, you're also at work," Kelly said. "Imagine being in your office for a year and you never get to leave. That is a challenge, it presents its own set of issues, but I think I'm up for it and I look forward to it."

Kelly spent 180 days in space during three earlier flights: as pilot of a shuttle mission in 1999 and as commander of another in 2007. He then served as a flight engineer aboard the space station during Expedition 25 in 2010 and as commander of Expedition 26 in 2011. His twin brother Mark, married to former congresswoman Gabrielle Giffords, also is a veteran shuttle commander.

Kornienko also is a space station veteran, logging more than 176 days in orbit as a flight engineer during Expeditions 23 and 24 in 2010.

Before, during and after their marathon stint in space, both men will be subjected to a battery of tests to measure their adaptation to weightlessness and what, if any, long-term effects might emerge.

U.S. and Russian researchers are focusing on seven general areas of interest:

-- How weightlessness triggers post-flight vision problems for some astronauts
-- Assessing exercise and nutrition in combating bone loss and muscle atrophy
-- How the immune system responds to long-duration exposure to microgravity
-- Assessing neurovestibular system changes that can affect balance and perception
-- Possible changes in crew behavior, performance and inter-personal relations
-- The effects of radiation exposure
-- Assessing crew training procedures and possible changes
- By William Harwood, CBS News

NASA Has Its Own On-Line Radio Station

It is called *Third Rock from the Sun,* and you can access it at www.rfcmedia.com/thirdrockradio/

Deadliest Space Weather Strikes the Weather Channel

The Weather Channel has greenlit *Deadliest Space Weather*, a new series that reveals extreme weather conditions that occur throughout our solar system, and explores the premise "What would happen if these harsh conditions could ever prevail on Earth?" Produced by Flight 33 (*Life After People*), *Deadliest Space Weather* features six 30-minute episodes and will premiere in January 2013.

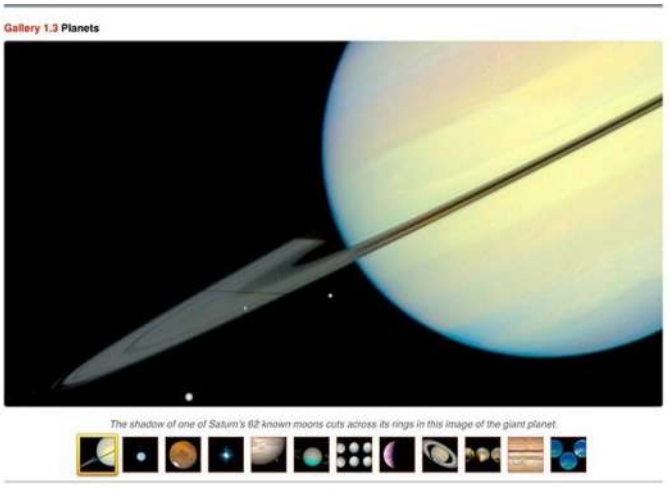
Rainstorms that can eat through solid steel, hurricane winds that blow at 1,600 miles per hour, and lightning bolts 10,000 times more powerful than anything on Earth exist elsewhere in our solar system. *Deadliest Space Weather* – through the use of cutting-edge graphics and vivid explanations from scientists – illustrates not only what these storms are like on other planets, but speculates what these extreme weather conditions would be like if they ever occurred on Earth, with examples such as Venus's deadly acid rain, Saturn's violent winds, and Mars' massive dust storms.

"Exploring these unique weather phenomena in our solar system is a fascinating journey, but one understands the true magnitude of these storms so much more when they are theoretically placed into the familiar context of life on Earth," said Michael Dingley, Sr. VP. "The 'What if?' factor really illustrates the sheer force and awe of these weather events so clearly, and makes them all the more relatable and impactful."

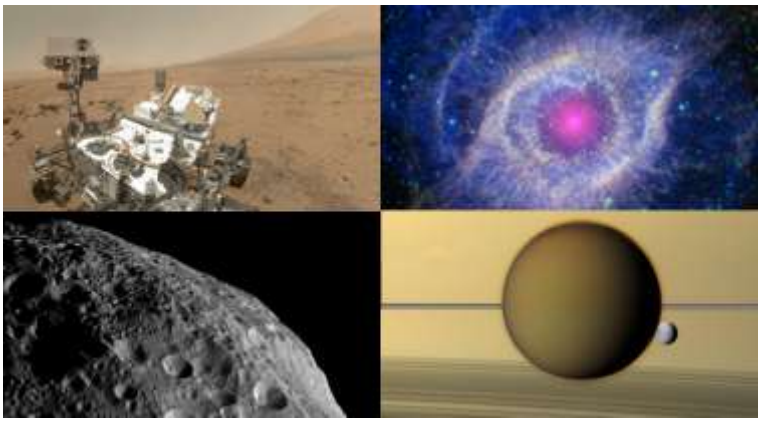
The network also announced another environmental and science-focused series, *Tipping Points*, which premieres Oct. 2013 and will explore Earth's changing climate system.

NASA Makes Interactive Hubble Book Free on iBooks

Apple's iBooks store has become a prime source for interactive books and those rich with multimedia content. It's the perfect platform for NASA to deliver stunning Hubble Space Telescope images and video in book form. One such volume is being made available for free. The book is called *Hubble Space Telescope: Discoveries*, and it's filled with high-resolution images, video, and animations of all manner of stellar wonders relating to the Hubble. This title is part of a series from NASA that will present the discoveries of Hubble and the upcoming Webb space telescope in an easy to consume way.



To check out the free NASA book you need to have an Apple iDevice running iOS 5.1 or higher. You won't be able to read on any other devices. The book clocks in at a whopping 893MB, so give it some time.
- By Ryan Whitwam, www.geek.com/articles/apple/nasa-makes-interactive-hubble-book-free-on-ibooks-20121226/



One Million Downloads for JPL Space Images App

Space Images, the mobile image application from JPL that puts visuals direct from space missions at users' fingertips, has reached 1 million downloads.
Just this year the app amassed exciting images from many of the laboratory's missions including the Mars Curiosity rover, which made a dramatic landing on Mars and has sent back many novel views of the Red Planet. Vibrant explosions from dying stars, the elegant choreography of Saturn's moons, and the scarred and cratered surface of a giant asteroid are just a few of the other scenes users can discover by downloading the app.
Chosen as a Staff Favorite in the Apple App Store shortly after its release in 2010, Space Images is now in Version 2, featuring videos and 3-D image collections and more extensive sharing options. The app is available free on both Android and Apple devices as well as online on the Space Images website at www.jpl.nasa.gov/spaceimages/.
Visit http://bit.ly/Ym9ir1 to download Space Images for Apple devices and http://bit.ly/T85EfG for Android devices. Explore more mobile offerings from JPL at www.jpl.nasa.gov/apps.
- www.jpl.nasa.gov/news/news.php?release=2012-407&cid=release_2012-407

Partnering to Solve Saturn's Mysteries

By Diane K. Fisher

From December 2010 through mid-summer 2011, a giant storm raged in Saturn's northern hemisphere. It was clearly visible not only to the Cassini spacecraft orbiting Saturn, but also astronomers here on Earth—even those watching from their backyards. The storm came as a surprise, since it was about 10 years earlier in Saturn's seasonal cycle than expected from observations of similar storms in the past. Saturn's year is about 30 Earth years. Saturn is tilted on its axis (about 27° to Earth's 23°), causing it to have seasons as Earth does.
But even more surprising than the unseasonal storm was the event that followed.
First, a giant bubble of very warm material broke through the clouds in the region of the now-abated storm, suddenly raising the temperature of Saturn's stratosphere over 150°F. Accompanying this enormous "burp" was a sudden increase in ethylene gas. It took Cassini's Composite Infrared Spectrometer instrument to detect it.
According to Dr. Scott Edgington, Deputy Project Scientist for Cassini, "Ethylene [C_2H_4] is normally present in only very low concentrations in Saturn's atmosphere. Although it is a transitional product of the thermochemical processes that normally occur in Saturn's atmosphere, the concentrations detected concurrent with the big 'burp' were 100 times what we would expect."
So what was going on?

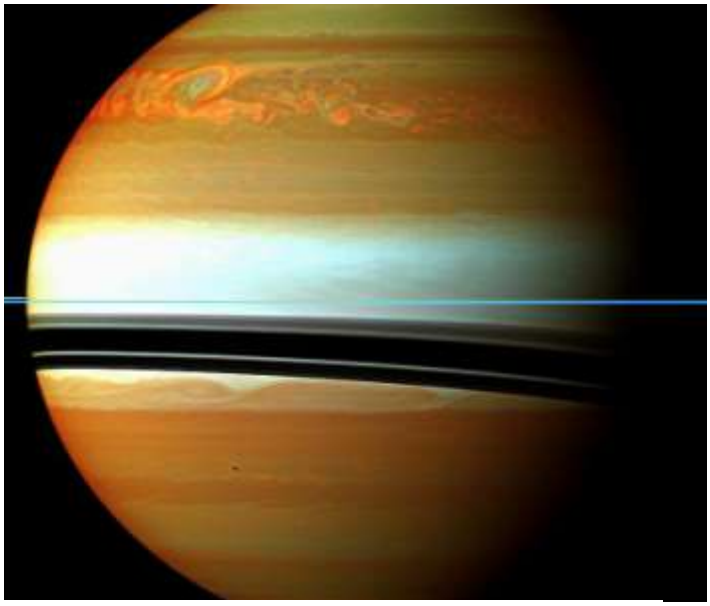
Chemical reaction rates vary greatly with the energy available for the process. Saturn's seasonal changes are exaggerated due to the effect of the rings acting as venetian blinds, throwing the northern hemisphere into shade during winter. So when the Sun again reaches the northern hemisphere, the photochemical reactions that take place in the atmosphere can speed up quickly. If not for its rings, Saturn's seasons would vary as predictably as Earth's.

But there may be another cycle going on besides the seasonal one. Computer models are based on expected reaction rates for the temperatures and pressures in Saturn's atmosphere, explains Edgington. However, it is very difficult to validate those models here on Earth. Setting up a lab to replicate conditions on Saturn is not easy!

Also contributing to the mystery is that haze on Saturn often obscures the view of storms below. Only occasionally do storms punch through the hazes. Astronomers may have previously missed large storms, thus failing to notice any non-seasonal patterns.

As for atmospheric events that are visible to Earth-bound telescopes, Edgington is particularly grateful for non-professional astronomers. While these astronomers are free to watch a planet continuously over long periods and record their finding in photographs, Cassini's science instruments must be shared with other scientists. Observation time on Cassini is planned more than six months in advance, making it difficult to immediately train it on the unexpected. That's where the volunteer astronomers come in, keeping a continuous watch on the changes taking place on Saturn.

Edgington says, "Astronomy is one of those fields where amateurs can contribute as much as professionals."



Caption: *This false-colored Cassini image of Saturn was taken in near-infrared light on January 12, 2011. Red and orange show clouds deep in the atmosphere. Yellow and green are intermediate clouds. White and blue are high clouds and haze. The rings appear as a thin, blue horizontal line.*

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

This has been a record year for stellar outreach - made possible by the dedication of astronomy clubs like yours. Over 2,000 upcoming events have already been posted to the NSN calendar for 2013 - a milestone! To help you get ready for a sparkly 2013, we've got lots of astro outreach goodies listed below:

Reserve Your Free Annual Award Pins for Outreach Stars

Be sure to receive your free NASA Night Sky Network Annual Outreach

Award Pins. One of the best ways to keep volunteers coming back is to thank them for their time and dedication. Take advantage of this opportunity to recognize all of the important work that your club members accomplished over the past year and honor them with a Night Sky Network Star pin. Volunteers will love the 2013 comet theme!

Three unique sky events could make 2013 extra special

- Asteroid flyby on Feb 15, 2013. (http://neo.jpl.nasa.gov/news/news174.html) No, it won't hit earth nor will we be able to see it naked eye. It's roughly the size of half a football field, but it will be 14,000 miles away. That's like trying to see a grain of sand from half a mile away.

Two comets could be VERY visible:

- PAN-STARRS in March 2013 (www.universetoday.com/97208/comet-pan-starrs-how-bright-will-it-get/)
- ISON in Nov/Dec 2013 (http://earthsky.org/space/big-sun-diving-comet-ison-might-be-spectacular-in-2013)

You can use the Cook Up a Comet (http://nightsky.jpl.nasa.gov/download-view.cfm?Doc_ID=258) NSN activity for your outreach. There's also a free iPhone app, CometQuest (http://ow.ly/g1wj5), via @NASAJPL. Photo above: Astronomical Society of the Toms River Area, New Jersey, cooking up a comet.

Travel to a Supernova!

Let's travel to the core of a red supergiant...which is about to go supernova! The education team the Astronomical Society of the Pacific wrote the captions to a NASA video, *SUPERNOVA, Explosion of a Massive Star* (www.youtube.com/watch?v=Q5UEMkvdnAc&feature=share&list=PLjLQn63Cw1ALYmc52HqTK7ndyYZ-uPr8m) that you can share with your audience. Winter is the perfect time to use the SUPERNOVA! ToolKit to view stars likely to go supernova.

Boost your outreach power on Facebook and Twitter

Did you know that we select your outstanding event photos and share them on the NSN Facebook page? Clubs get additional publicity the public sees your fabulous outreach.

If you're not on Facebook or Twitter (on Twitter, add @nightskynetwork to your tweet so we'll see your photo), login to the NSN website and post your photos. Photos are subject to selection. Outstanding astrophotos are always welcome!

"What kind of telescope should I buy?"

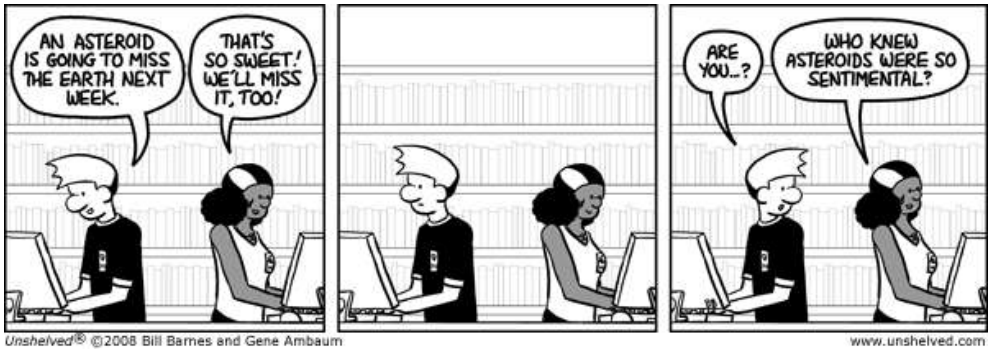
With the holiday season around the corner, many people will ask you about telescopes. A perfect gift is a membership to a Night Sky Network astronomy club. Share our article, What kind of telescope should I buy? (https://nightsky.jpl.nasa.gov/news-display.cfm?News_ID=545) with your audience and promote your astro club.

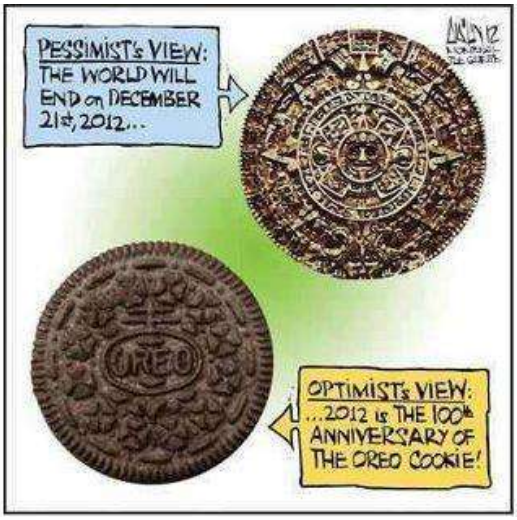
(Hannah of the Colorado Springs Astronomical Society uses her telescope to show visitors the night sky.)

Wishing you clear skies and sparkly outreach in 2013!,
Marni Berendsen, Jessica Santascoy, & Vivian White, The Night Sky Network Team, nightskyinfo@astrosociety.org
The NASA Night Sky Network is a nationwide coalition of nearly 400 amateur astronomy clubs. The NASA Night Sky Network is managed by The Astronomical Society of the Pacific.

SWFAS Minutes

December minutes will be posted in a future newsletter.





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