



Catskills Astronomy Club News

January, 2008

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1/1/08

Club News:

The first “movie and dinner” meeting for the winter season was held at Morgan Outdoors in Livingston Manor on December 8th. The PBS movie entitled “Seeing in the Dark” was shown. The movie was well received and gave a more personal side to amateur astronomy. It was narrated by Timothy Ferris who is an author of many astronomy related books. After the movie the sky was clear enough to hold a brief observation session at the Covered Bridge Park in Livingston Manor. Nine people attended the session. Two telescopes were set up to view a variety of objects. The highlights of the evening were Comet Holmes and Mars. Comet Holmes was easily seen by the naked eye and in a telescope it appeared as a large diffuse cloud. The sky was steady enough to make out some dark surface features on Mars as well as one a hint of one of its polar caps. The Orion Nebula and Andromeda Galaxy were also observed.

The December 15th observation session was canceled due to poor weather.

A future “dinner and a movie” meeting is in the process of being scheduled for sometime in February.

The proposed 2008 observation dates are shown below. Alternate dates will be announced as needed.

The 8/2 session will be held at an alternate location due to a Civil War reenactment at Walnut Mountain that evening.

1/5, 1/12, 2/2, 2/9, 3/1, 3/8, 4/5, 4/12, 5/3, 5/10, 6/7, 6/28, 7/5, 7/26, 8/2, 8/30, 9/6, 9/27, 10/4, 10/25, 11/1, 11/29, 12/20, 12/27

Anyone interested in submitting an astronomical observation or photograph for the newsletter, please contact John at kocis@verizon.net.

The club has selection of astronomy books and DVDs in our library to lend to members. A Meade eight inch reflector and Edmund three inch reflector are also available for members to borrow. Please contact John at 791-5240 or kocis@verizon.net if you are interested in borrowing any of these.

Astronomy News:

Here are some articles from various NASA sources that might be of interest.

NEWS RELEASE: 2007-149

Dec. 12, 2007

Saturn's Rings May be Old Timers

SAN FRANCISCO, Calif. – New observations by NASA's Cassini spacecraft indicate the rings of Saturn, once thought to have formed during the age of the dinosaurs, instead may have been created roughly 4.5 billion years ago, when the solar system was still under construction.

Larry Esposito, principal investigator for Cassini's Ultraviolet Imaging Spectrograph at the University of Colorado, Boulder, said data from NASA's Voyager spacecraft in the 1970s, and later from NASA's Hubble Space Telescope, led scientists to believe Saturn's rings were relatively youthful and likely created by a comet that shattered a large moon, perhaps 100 million years ago.

But ring features seen by instruments on Cassini -- which arrived at Saturn in 2004 -- indicate the rings were not formed by a single cataclysmic event. The ages of the different rings appear to vary significantly, and the ring material is continually being recycled, Esposito said.

"The evidence is consistent with the picture that Saturn has had rings all through its history," said Esposito of the University of Colorado's Laboratory for Atmospheric and Space Physics. "We see extensive, rapid recycling of ring material, in which moons are continually shattered into ring particles, which then gather together and re-form moons."

Esposito and colleague Miodrag Sremcevic, also with the University of Colorado, are presenting these findings today in a news briefing at the meeting of the American Geophysical Union in San Francisco.

"We have discovered that the rings probably were not created just yesterday in cosmic time, and in this scenario, it is not just luck that we are seeing planetary rings now," said Esposito. "They probably were always around but continually changing, and they will be around for many billions of years."

Scientists had previously believed rings as old as Saturn itself should be darker due to ongoing pollution by the "infall" of meteoric dust, leaving telltale spectral signatures, Esposito said. But the new Cassini observations indicate the churning mass of ice and rock within Saturn's gigantic ring system is likely much larger than previously estimated. This helps explain why the rings overall appear relatively bright to ground-based telescopes and spacecraft.

"The more mass there is in the rings, the more raw material there is for recycling, which essentially spreads this cosmic pollution around," he said. "If this pollution is being shared by a much larger volume of ring material, it becomes diluted and helps explain why the rings appear brighter and more pristine than we expected."

Esposito, who discovered Saturn's faint F ring in 1979 using data from NASA's Pioneer 11 spacecraft, said a paper by him and his colleagues appearing in an upcoming issue of the journal *Icarus* supports the theory that Saturn's ring material is being continually recycled. Observing the flickering of starlight passing through the rings in a process known as stellar occultation, the researchers discovered 13 objects in the F ring ranging in size from 27 meters to 10 kilometers (30 yards to six miles) across.

Since most of the objects were translucent -- indicating at least some starlight was passing through them -- the researchers concluded they probably are temporary clumps of icy boulders that are continually collecting and disbanding due to the competing processes of shattering and coming together again. The team tagged the clumpy moonlets with cat names like "Mittens" and "Fluffy" because they appear to come and go unexpectedly over time and have multiple lives, said Esposito.

Esposito stressed that Saturn's rings of the future won't be the same rings we see today, likening them to great cities around the world like San Francisco, Berlin or Beijing. "While the cities themselves will go on for centuries or millennia, the faces of people on the streets will always be changing due to continual birth and aging of new citizens."

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate in Washington, D.C.

For more information about the Cassini-Huygens mission, visit:

<http://www.kintera.org/TR.asp?a=crJNL1ODJfKNL6I&s=ioIPLVPvG8LHJSPBH&m=grLSJZPzHcLXF>

and

<http://www.kintera.org/TR.asp?a=9eIHJSMrGcIJJLZJ&s=ioIPLVPvG8LHJSPBH&m=grLSJZPzHcLXF>

To listen to a podcast of Esposito and view a short video animation of objects in Saturn's F ring shattering and re-forming, visit:

<http://www.kintera.org/TR.asp?a=fuITKaPPLiKXKjL&s=ioIPLVPvG8LHJSPBH&m=grLSJZPzHcLXF>

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NEWS RELEASE: 2007-152

Dec. 21, 2007

Astronomers Monitor Asteroid to Pass Near Mars

WASHINGTON - Astronomers funded by NASA are monitoring the trajectory of an asteroid

estimated to be 50 meters (164 feet) wide that is expected to cross Mars' orbital path early next year. Observations provided by the astronomers and analyzed by NASA's Near-Earth Object Office at the Jet Propulsion Laboratory in Pasadena, Calif., indicate the object may pass within 30,000 miles of Mars at about 6 a.m. EST (3 a.m. PST) on Jan. 30, 2008.

"Right now asteroid 2007 WD5 is about half-way between Earth and Mars and closing the distance at a speed of about 27,900 miles per hour," said Don Yeomans, manager of the Near Earth Object Office at JPL. "Over the next five weeks, we hope to gather more information from observatories so we can further refine the asteroid's trajectory."

NASA detects and tracks asteroids and comets passing close to Earth. The Near Earth Object Observation Program, commonly called "Spaceguard," plots the orbits of these objects to determine if any could be potentially hazardous to our planet.

Asteroid 2007 WD5 was first discovered on Nov. 20, 2007, by the NASA-funded Catalina Sky Survey and put on a "watch list" because its orbit passes near Earth. Further observations from both the NASA-funded Spacewatch at Kitt Peak, Ariz., and the Magdalena Ridge Observatory in New Mexico gave scientists enough data to determine that the asteroid was not a danger to Earth, but could potentially impact Mars. This makes it a member of an interesting class of small objects that are both near Earth objects and "Mars crossers."

Because of current uncertainties about the asteroid's exact orbit, there is a 1-in-75 chance of 2007 WD5 impacting Mars. If this unlikely event were to occur, it would be somewhere within a broad swath across the planet north of where the Opportunity rover is located.

"We estimate such impacts occur on Mars every thousand years or so," said Steve Chesley, a scientist at JPL. "If 2007 WD5 were to thump Mars on Jan. 30, we calculate it would hit at about 30,000 miles per hour and might create a crater more than half-a-mile wide." The Mars Rover Opportunity is exploring a crater approximately this size right now.

Such a collision could release about three megatons of energy. Scientists believe an event of comparable magnitude occurred here on Earth in 1908 in Tunguska, Siberia, but no crater was created. The object was disintegrated by Earth's thicker atmosphere before it hit the ground, although the air blast devastated a large area of unpopulated forest.

NASA and its partners will continue to track asteroid 2007 WD5 and will provide an update in January when further information is available. For more information on the Near Earth Object program, visit: <http://neo.jpl.nasa.gov/> .

An audio interview/podcast regarding 2007 WD5 is available at:
<http://www.jpl.nasa.gov/multimedia/podcast/mars-asteroid-20071221/>

A videofile related to this story is available on NASA TV and the Web. For information and schedules, visit: <http://www.nasa.gov/ntv>.

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10,000 Earths' Worth of Fresh Dust Found Near Star Explosion

Astronomers have at last found definitive evidence that the universe's first dust – the celestial stuff that seeded future generations of stars and planets – was forged in the explosions of massive stars.

The findings, made with NASA's Spitzer Space Telescope, are the most significant clue yet in the longstanding mystery of where the dust in our very young universe came from. Scientists had suspected that exploding stars, or supernovae, were the primary source, but nobody had been able to demonstrate that they can create copious amounts of dust – until now. Spitzer's sensitive infrared detectors have found 10,000 Earth masses worth of dust in the blown-out remains of the well-known supernova remnant Cassiopeia A.

"Now we can say unambiguously that dust – and lots of it – was formed in the ejecta of the Cassiopeia A explosion. This finding was possible because Cassiopeia A is in our own galaxy, where it is close enough to study in detail," said Jeonghee Rho of NASA's Spitzer Science Center at the California Institute of Technology in Pasadena. Rho is the lead author of a new report about the discovery appearing in the Jan. 20 issue of the *Astrophysical Journal*.

Space dust is everywhere in the cosmos, in our own neck of the universe and all the way back billions of light-years away in our infant universe. Developing stars need dust to cool down enough to collapse and ignite, while planets and living creatures consist of the powdery substance. In our nearby universe, dust is pumped out by dying stars like our sun. But back when the universe was young, sun-like stars hadn't been around long enough to die and leave dust.

That's where supernovae come in. These violent explosions occur when the most massive stars in the universe die. Because massive stars don't live very long, theorists reasoned that the very first exploding massive stars could be the suppliers of the unaccounted-for dust. These first stars, called Population III, are the only stars that formed without any dust.

Other objects in addition to supernovae might also contribute to the universe's first dust. Spitzer recently found evidence that highly energetic black holes, called quasars, could, together with supernovae, manufacture some dust in their winds (<http://www.spitzer.caltech.edu/Media/releases/ssc2007-16/index.shtml>) .

Rho and her colleagues analyzed the Cassiopeia A supernova remnant, located about 11,000 light-years away. Though this remnant is not from the early universe, its proximity to us makes it easier to address the question of whether supernovae have the ability to synthesize significant amounts of dust. The astronomers analyzed the infrared light coming from Cassiopeia A using Spitzer's infrared spectrograph, which spreads light apart to reveal the signatures of different elements and molecules. "Because Spitzer is extremely sensitive to dust, we were able to make high-resolution maps of dust in the entire structure," said Rho.

The map reveals the quantity, location and composition of the supernova remnant's dust, which includes proto-silicates, silicon dioxide, iron oxide, pyroxene, carbon, aluminium oxide and other compounds. One of the first things the astronomers noticed was that the dust matches up perfectly with the gas, or ejecta, known to have been expelled in the explosion. This is the smoking gun indicating the dust was freshly made in the ejecta from the stellar blast. "Dust forms a few to several hundred days after these energetic explosions, when the temperature of gas in the ejecta cools down," said Takashi Kozasa, a co-author at the Hokkaido University in Japan.

The team was surprised to find freshly-made dust deeper inside the remnant as well. This cooler dust, mixed in with gas referred to as the unshocked ejecta, had never been seen before.

All the dust around the remnant, both warm and cold, adds up to about three percent of the mass of the sun, or 10,000 Earths. This is just enough to explain where a large fraction, but not all, of the universe's early dust came from. "Perhaps at least some of the unexplained portion is much colder dust, which could be observed with upcoming telescopes, such as Herschel," said Haley Gomez, a co-author at University of Wales, Cardiff. The Herschel Space Observatory, scheduled to launch in 2008, is a European Space Agency mission with significant NASA participation.

Rho also said that more studies of other supernovae from near to far are needed to put this issue to rest. She notes that the rate at which dust is destroyed – a factor in determining how much dust is needed to explain the dusty early universe – is still poorly understood.

The principal investigator of the research program, and a co-author of the paper, is Lawrence Rudnick of the University of Minnesota, Twin Cities. Other co-authors include W.T. Reach of the Spitzer Science Center; J. D. Smith of the Steward Observatory, Tucson, Ariz.; T. Delaney of the Massachusetts Institute of Technology, Cambridge; J.A. Ennis of the University of Minnesota; and A. Tappe of the Spitzer Science Center and the Harvard Smithsonian Center for Astrophysics, Cambridge, Mass.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate, Washington. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology. Caltech manages JPL for NASA. Spitzer's infrared spectrograph was built by Cornell University, Ithaca, N.Y. Its development was led by Jim Houck of Cornell. For more information about Spitzer, visit <http://www.spitzer.caltech.edu/spitzer> and <http://www.nasa.gov/spitzer>.

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NEWS RELEASE: 2007-145

December 11, 2007

New NASA Mission to Reveal Moon's Internal Structure and Evolution

At a Monday, Dec. 10 meeting of the American Geophysical Union, NASA's Associate Administrator for Science Alan Stern announced the selection of a new mission that will peer deep inside the moon to reveal its anatomy and history.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., will manage the Grail mission. The spacecraft will be built by Lockheed Martin Space Systems, Denver.

The Gravity Recovery and Interior Laboratory, or Grail, mission is a part of NASA's Discovery Program. It will cost \$375 million and is scheduled to launch in 2011. Grail will fly twin spacecraft in tandem orbits around the moon for several months to measure its gravity field in unprecedented detail. The mission also will answer longstanding questions about Earth's moon and provide scientists a better understanding of how Earth and other rocky planets in the solar system formed.

"Grail's revolutionary capabilities stood out in this Discovery mission competition owing to its unsurpassed combination of high scientific value and low technical and programmatic risk," Stern said. "Grail also offers to bring innovative Earth studies techniques to the moon as a precursor to their possible later use at Mars and other planets."

Scientists will use the gravity field information from the two satellites to X-ray the moon from crust to core to reveal the moon's subsurface structures and, indirectly, its thermal history.

The study technique Grail will use was pioneered by the joint U.S.-German Earth observing Gravity Recovery and Climate Experiment, or Grace, mission launched in 2002. The Grace satellites measure gravity changes related to the movement of mass within Earth, such as the melting of ice at the poles and changes in ocean circulation. As with Grace, both Grail spacecraft will be launched on a single launch vehicle.

Grail's principal investigator is Maria Zuber of the Massachusetts Institute of Technology in Cambridge. Zuber's team of expert scientists and engineers includes former NASA astronaut Sally Ride, who will lead the mission's public outreach efforts. A camera aboard each spacecraft will allow students and the public to interact with observations from the satellites. Each Grail spacecraft will carry the cameras to document their views from lunar orbits.

Grail will support NASA's exploration goals as the agency returns humans to the moon by 2020. In 2008, the agency will launch the Lunar Reconnaissance Orbiter, to circle the moon for at least a year and take measurements to identify future robotic and human landing sites. The orbiter also will look for potential lunar resources and document aspects of the lunar radiation environment. After a 30-year hiatus, the Lunar Reconnaissance Orbiter represents NASA's first step toward returning humans to the moon. The orbiter will be accompanied by another spacecraft, called the Lunar Crater Observation and Sensing Satellite mission, which will impact the lunar south pole to search for evidence of polar water frost.

"As NASA moves forward with exploration endeavors, our lunar science missions will be the light buoy leading the path for future human activities," said Jim Green, director of the Planetary Division, Science Mission Directorate, Washington.

Created in 1992, NASA's Discovery Program sponsors a series of scientist-led, cost-capped solar system exploration missions with highly focused scientific goals. The Grail proposal was selected

from 24 submissions in response to a 2006 Announcement of Opportunity for the program. Proposals were evaluated for scientific merit, science implementation merit, and technical, management and cost feasibility.

For more information about NASA's Discovery Program, visit: <http://discovery.nasa.gov/> .

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NEWS RELEASE: 2007-141

NASA Mega-Telescope Gears up to Study Cosmos

NASA has selected three teams of scientists to begin studying disks of dust around nearby stars starting in February 2008, using the Keck Interferometer in Mauna Kea, Hawaii. This sophisticated new system combines the observing power of the two large Keck telescopes into a single mega-telescope.

The announcement follows completion of the Keck Interferometer's technology phase, in which its detectors, starlight trackers, active optics and computer control systems were installed, tested and integrated. Testing was conducted on stars, in the first on-sky demonstration of long-baseline nulling interferometry, a technique that "cancels" the bright light from the star to see fainter material around it.

The newly selected teams are led by the following principal investigators:

- Phil Hinz, University of Arizona, Tucson, Ariz.
- Marc Kuchner, Goddard Space Flight Center, Greenbelt, Md.
- Eugene Serabyn, Jet Propulsion Laboratory, Pasadena, Calif.

The teams will study stars with known debris disks and look for signs of dust around other stars. Some debris disks are remnants from planet formation; others contain material kicked up when asteroids collide. Asteroid collisions in our solar system produce a disk of what's called "zodiacal dust." This can be seen when sunlight scatters small dust grains to produce a faint band of light visible against a dark sky just after sunset or before dawn. The Keck Interferometer science teams are looking for comparable, although much brighter, disks in other planetary systems.

The Keck Interferometer links the Keck Observatory's two 10-meter (33-foot) telescopes. It is part of NASA's ongoing quest to search for planets orbiting other stars. JPL, a division of the California Institute of Technology in Pasadena, manages the Keck Interferometer for NASA. The Keck Interferometer was developed by JPL, the W.M. Keck Observatory and the Michelson Science Center at Caltech. The W.M. Keck Observatory is funded by Caltech, the University of California and NASA, and is managed by the California Association for Research

in Astronomy, Kamuela, Hawaii.

More information on the Keck Interferometer is at http://planetquest.jpl.nasa.gov/Keck/keck_index.cfm . Click "Visualizations" for a virtual tour and animation.

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NEWS RELEASE: 2007-150

December 13, 2007

NASA Sends Spacecraft on Mission to Comet Hartley 2

NASA has approved the retargeting of the Epoxi mission for a flyby of comet Hartley 2 on Oct. 11, 2010. Hartley 2 was chosen as Epoxi's destination after the initial target, comet Boethin, could not be found. Scientists theorize comet Boethin may have broken up into pieces too small for detection.

The Epoxi mission melds two compelling science investigations -- the Extrasolar Planet Observation and Characterization and the Deep Impact Extended Investigation. Both investigations will be performed using the Deep Impact spacecraft.

In addition to investigating comet Hartley 2, the spacecraft will point the larger of its two telescopes at nearby previously discovered extrasolar planetary systems in late January 2008. It will study the physical properties of giant planets and search for rings, moons and planets as small as three Earth masses. It also will look at Earth as though it were an extrasolar planet to provide data that could become the standard for characterizing these types of planets.

"The search for exosolar planetary systems is one of the most intriguing explorations of our time," said Drake Deming, Epoxi deputy principal investigator at NASA's Goddard Space Flight Center, Greenbelt, Md. "With Epoxi we have the potential to discover new worlds and even analyze the light they emit to perhaps discover what atmospheres they possess."

The mission's closest approach to the small half-mile-wide comet will be about nearly a thousand kilometers (620 miles). The spacecraft will employ the same suite of two science instruments the Deep Impact spacecraft used during its prime mission to guide an impactor into comet Tempel 1 in July 2005.

If Epoxi's observations of Hartley 2 show it is similar to one of the other comets that have been observed, this new class of comets will be defined for the first time. If the comet displays different characteristics, it would deepen the mystery of cometary diversity.

"When comet Boethin could not be located, we went to our backup, which is every bit as interesting but about two years farther down the road," said Tom Duxbury, Epoxi project manager at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

Mission controllers at JPL began directing Epoxi towards Hartley 2 on Nov. 1. They commanded the spacecraft to perform a three-minute rocket burn that changed the spacecraft's velocity. Epoxi's new trajectory sets the stage for three Earth flybys, the first on Dec. 31, 2007. This places the spacecraft into an orbital "holding pattern" until it's time for the optimal encounter of comet Hartley 2 in 2010.

"Hartley 2 is scientifically just as interesting as comet Boethin because both have relatively small, active nuclei," said Michael A'Hearn, principal investigator for Epoxi at the University of Maryland, College Park.

Epoxi's low mission cost of \$40 million is achieved by taking advantage of the existing Deep Impact spacecraft.

JPL manages Epoxi for NASA's Science Mission Directorate, Washington. The spacecraft was built for NASA by Ball Aerospace & Technologies Corp., Boulder, Colo.

For information about Epoxi, visit [HYPERLINK](#)

"<http://www.kintera.org/TR.asp?a=chJOLXOFJgKKL9I&s=hnKNLSPrF7IFLPPxC&m=hiKUL7MFL8LXE>" \t "_blank" <http://www.nasa.gov/epoxi> .

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NEWS RELEASE: 2007-146

Dec. 11, 2007

Mars Orbiter Examines 'Lace' and 'Lizard Skin' Terrain

SAN FRANCISCO - Scrutiny by NASA's newest Mars orbiter is helping scientists learn the stories of some of the weirdest landscapes on Mars, as well as more familiar-looking parts of the Red Planet.

One type of landscape near Mars' south pole is called "cryptic terrain" because it once defied explanation, but new observations bolster and refine recent interpretations of how springtime outbursts of carbon-dioxide gas there sculpt intricate patterns and paint seasonal splotches.

"A lot of Mars looks like Utah, but this is an area that looks nothing like Planet Earth," said Candice Hansen of NASA's Jet Propulsion Laboratory, Pasadena, Calif., deputy principal investigator for the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter.

In addition to radially branching patterns called "spiders," which had been detected by an earlier Mars orbiter, other intriguing ground textures in the area appear in the new images. "In some places, the channels form patterns more like lace. In others, the texture is reminiscent of lizard skin," Hansen said.

Results from all six instruments on the Mars Reconnaissance Orbiter, which reached Mars last year, are described in dozens of presentations this week by planetary scientists in San Francisco at the fall meeting of the American Geophysical Union.

By taking stereo pictures of a target area from slightly different angles during different orbits, HiRISE can show the surface in three dimensions. Channels found to widen as they run uphill in the cryptic terrain region testify that the channels are cut by a gas, not a liquid.

Earlier evidence for jets of gas active in the region came from fan-shaped blotches appearing seasonally, which scientists interpret as material fallen to the surface downwind of vents where the gas escapes. Some of the fans are dark, others bright. "The dark fans are probably dust, but the exact composition of the brighter fans had remained unknown until now," said Tim Titus of the U.S. Geological Survey's Astrogeology Team, Flagstaff, Ariz.

Observations by the new orbiter's Compact Reconnaissance Imaging Spectrometer for Mars suggest that the bright fans are composed of carbon-dioxide frost. Here's the story researchers now propose: Spring warms the ground under a winter-formed coating of carbon dioxide ice. Thawing at the base of the coating generates carbon-dioxide gas, which carves channels as it pushes its way under the ice to a weak spot where it bursts free. The jet of escaping gas carries dust aloft and also cools so fast from expanding rapidly that a fraction of the carbon dioxide re-freezes and falls back to the surface as frost.

The processes creating the cryptic terrain are current events on Mars. Repeated HiRISE observations of the same target area show the downwind fans can form and grow perceptibly in less than five days.

Other new findings from the Mars Reconnaissance Orbiter reveal processes of Martian environments long ago. A team including Chris Okubo of the University of Arizona, Tucson, used stereo HiRISE images to examine layered deposits inside Mars' Candor Chasma, part of Valles Marineris, the largest canyon system in the solar system.

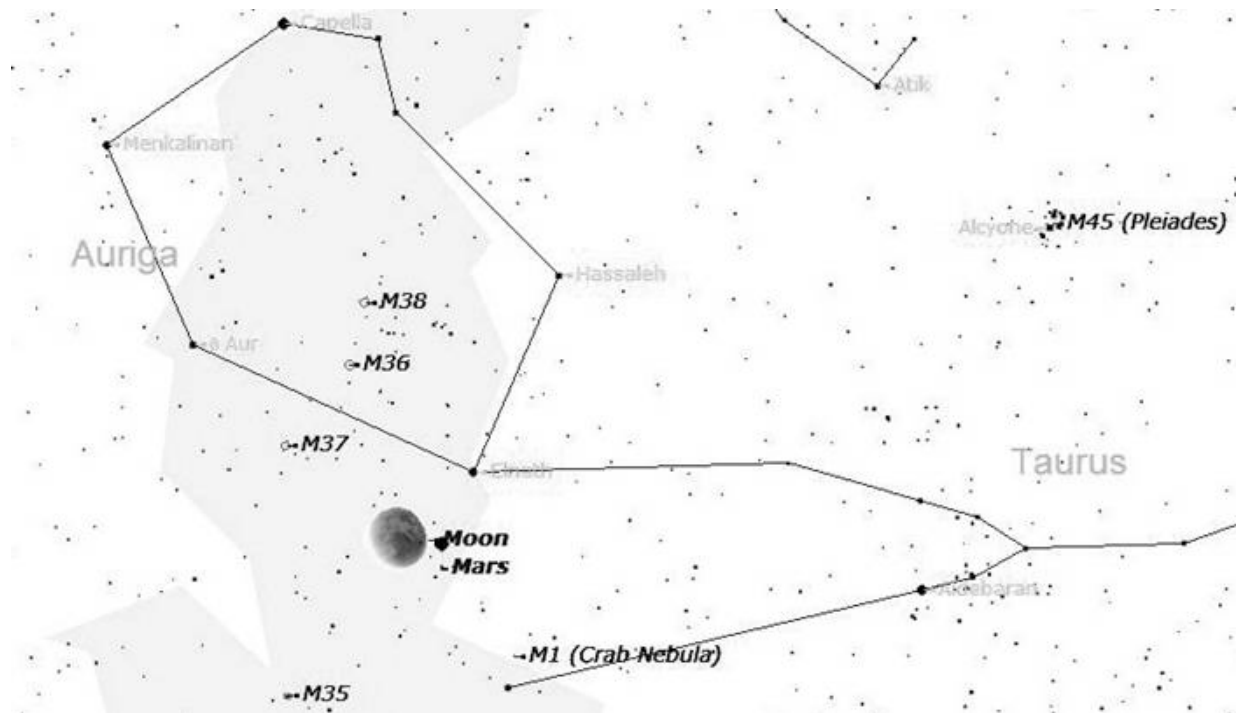
"The high-resolution structural map allowed us to interpret the geological history of the area," Okubo said. "The layers are tilted in a way that tells us they are younger than the canyon." Spectrometer studies of the composition of these deposits had indicated water played a role in their formation, but their age relative to the formation of the canyon had been uncertain. The new findings suggest water was present after the canyon formed.

JPL, a division of the California Institute of Technology in Pasadena, manages the Mars Reconnaissance Orbiter mission for the NASA Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, is the prime contractor for the project and built the spacecraft. The University of Arizona operates the HiRISE camera, which was built by Ball Aerospace and Technology Corp., Boulder, Colo. The Compact Reconnaissance Imaging Spectrometer for Mars team, led by Johns Hopkins University's Applied Physics Laboratory, includes expertise from universities, government agencies and small businesses in the United States and abroad.

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Mid Evening Observing Highlights for January

Mars is high in the eastern sky between Gemini and Auriga. Orion is dominant in the southeastern sky. Below the three stars of “Orion’s Belt” the nebula M42 can be seen. Sirius can be seen rising in the southeastern sky as well. It is the brightest star that can be seen in the night sky in the northern hemisphere. The Andromeda Galaxy (M31) is in the western sky. The Great Square in Pegasus is setting in the western sky. The Double Cluster in Perseus can be found close to the zenith. The Milky Way stretches from the southeast to northwest. Full moon is on January 22nd and new moon is on January 8th. On January 19th the moon and Mars are very close to each other in the early evening sky. The image below shows this conjunction as well as some of the deep sky objects in the same area of the sky.



Member Photos:

The image below shows was taken by John Kocijanski with a Canon S3 IS digital zoom camera and shows the constellation Cassiopeia.



NASA Space Place

Ultraviolet Surprise

by Patrick L. Barry and Tony Phillips

How would you like to visit a universe full of exotic stars and weird galaxies the likes of which astronomers on Earth have never seen before?

Now you can. Just point your web browser to **HYPERLINK** "<http://galex.stsci.edu>" galex.stsci.edu and start exploring.

That's the address of the Galaxy Evolution Explorer image archive, a survey of the whole sky at ultraviolet wavelengths that can't be seen from the ground. Earth's atmosphere blocks far-ultraviolet light, so the only way to see the ultraviolet sky is by using a space telescope such as

NASA's Galaxy Evolution Explorer.

About 65% of the images from the all-sky survey haven't been closely examined by astronomers yet, so there are plenty of surprises waiting to be uncovered.

“The Galaxy Evolution Explorer produces so much data that, beyond basic quality control, we just don't have time to look at it all,” says Mark Seibert, an astronomy postdoc at the Observatories of the Carnegie Institution of Washington in Pasadena, California.

This fresh view of the sky has already revealed striking and unexpected features of familiar celestial objects. Mira is a good example. Occasionally visible to the naked eye, Mira is a pulsating star monitored carefully by astronomers for more than 400 years. Yet until Galaxy Evolution Explorer recently examined Mira, no one would have guessed its secret: Mira possesses a comet-like tail 13 light-years long.

“Mira shows us that even well-observed stars can surprise us if we look at them in a different way and at different frequencies,” Seibert says.

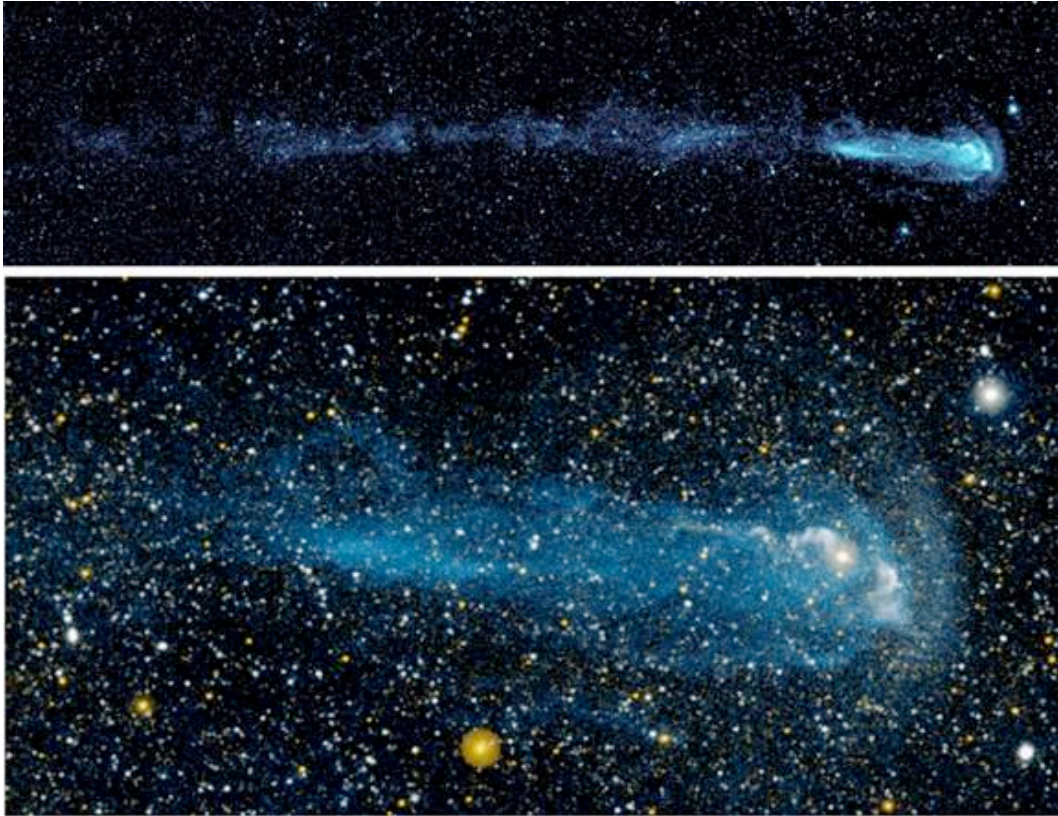
Another example: In April, scientists announced that galaxies such as NGC 1512 have giant ultraviolet spiral arms extending three times farther out into space than the arms that can be seen by visible-light telescopes. It would be like looking at your pet dog through an ultraviolet telescope and discovering his ears are really three times longer than you thought!

The images from the ultraviolet space telescope are ideal for hunting new phenomena. The telescope's small, 20-inch primary mirror (not much bigger than a typical backyard telescope) offers a wide field of view. Each image covers 1.2 degrees of sky—lots of territory for the unexpected.

If someone combing the archives does find something of interest, Seibert advises that she or he should first search astronomy journals to see whether the phenomenon has been observed before. If it hasn't, email a member of the Galaxy Evolution Explorer science team and let them know, Seibert says.

So what are you waiting for? Fire up your web browser and let the discoveries begin!

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



Caption:

Astronomers looking at new ultraviolet images from the Galaxy Evolution Explorer spacecraft were surprised to discover a 13-light-year long tail on Mira, a star that has been extensively studied for 400 years.