



Club News

January, 2006

John Kocijanski, Editor
Jim McKeegan, President
John Kocijanski, Vice President
Lisa Brody, Treasurer
Bud Wertheim, Secretary

The December 10th observation session was held at Walnut Mountain. Two members attended. The drive to the ball field was drifted over so the session was held in the parking area just outside the gate. The view of the sky was more limited there but enough of the sky was viewable to make the session enjoyable. Since the moon was in first gibbous it was the main object for the evening. The sky was fairly steady at times so the lunar surface features along the terminator provided great views. The Hortensius Domes were observed. There are volcanic domes that are a bit southwest of the prominent crater Copernicus. Along the terminator they appear as bumps on the lunar surface. The solitary mountain Mons La Hire was also observed. It cast a long triangular shadow into Mare Imbrium. Double stars like Almach in Andromeda and open clusters like the Pleiades were also observed. The sky was steady enough to get a decent look at Mars too. Dark areas on the surface were seen although it was smaller in size compared to last month. Saturn was in the sky but could not be seen through the trees. When we walked up the drive we saw it well below Gemini in the east.

The December 3rd observation session was canceled due to the predicted cloudy skies. The skies turned out to be clear that evening though.

This month on 1/21 we plan to have our first indoor meeting at Morgan Outdoors in Livingston Manor. Lisa Lyons has graciously allowed us to use her store for the meeting. The meeting will feature a showing of a PBS/Nova documentary film on some aspect of astronomy. We plan the event to be similar to the cable TV show "Dinner and a Movie" on TBS. (<http://www.tbs.com/movies/dinnerandamovie/>) We would like to order in dinner and view the documentary. After that we can discuss the film and possibly do some observing if the sky is clear. At this point the start time, film, and menu are undecided. The dinner could be as simple as ordering out for pizza.

We do need help in finding a large TV for the event. Anyone who is willing to contribute one for the meeting please contact John at kocis@verizon.net or 791-5240.

The proposed 2006 observation dates are shown below. Alternate dates will be announced as needed.

1/21, 1/28, 2/4, 2/25, 3/4, 3/25, 4/1, 4/29, 5/20, 5/27, 6/17, 6/24, 7/22, 7/29, 8/19, 8/26, 9/16, 9/23, 10/14, 10/21, 11/18, 11/25, 12/16, 12/23

The only date that will not be held at Walnut will be 7/29 due to a Civil War reenactment. We may hold that session at The Town of Thompson Park in Monticello.

The club has selection of astronomy books, Stardate audio CDs, a Macintosh computer with astronomy software, and a Meade 8 inch reflector 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 2005-177

Dec. 21, 2005

NASA Prepares for Return of Interstellar Cargo

NASA's Stardust mission is nearing Earth after a 2.88 billion mile round-trip journey to return cometary and interstellar dust particles back to Earth. Scientists believe the cargo will help provide answers to fundamental questions about comets and the origins of the solar system.

The velocity of the sample return capsule, as it enters Earth's atmosphere at 46,440 kilometers per hour (28,860 miles per hour), will be the fastest of any human-made object on record. It surpasses the record set in May 1969 during the return of the Apollo 10 command module. The capsule is scheduled to return on Jan. 15, 2006.

"Comets are some of the most informative occupants of the solar system. The more we can learn from science exploration missions like Stardust, the more we can prepare for human exploration to the moon, Mars and beyond," said Dr. Mary Cleave, associate administrator for NASA's Science Mission Directorate.

Several events must occur before scientists can retrieve cosmic samples from the capsule landing at the U.S. Air Force Utah Test and Training Range, southwest of Salt Lake City. Mission navigators will command the spacecraft to perform targeting maneuvers on Jan. 5 and 13. On Jan 14 at 9:57 p.m. PST (12:57 a.m. EST on Jan. 15), Stardust will release its sample return capsule. Four hours later, the capsule will enter Earth's atmosphere 125 kilometers (410,000 feet) over the Pacific Ocean.

The capsule will release a drogue parachute at approximately 32 kilometers (105,000 feet). Once the capsule has descended to about 3 kilometers (10,000 feet), the main parachute will deploy. The capsule is scheduled to land on the range at 3:12 a.m. PST (5:12 a.m. EST).

After the capsule lands, if conditions allow, a helicopter crew will fly it to the U.S. Army Dugway Proving Ground, Utah, for initial processing. If weather does not allow helicopters to fly, special off-road vehicles will retrieve the capsule and return it to Dugway. Samples will then be moved to a special laboratory at NASA's Johnson Space Center, Houston, where they will be preserved and studied.

"Locked within the cometary particles is unique chemical and physical information that could be the record of the formation of the planets and the materials from which they were made," said Dr. Don Brownlee, Stardust principal investigator at the University of Washington, Seattle.

NASA expects most of the collected particles to be no more than a third of a millimeter across. Scientists will slice these particle samples into even smaller pieces for study.

NASA's Jet Propulsion Laboratory, Pasadena, Calif. manages the Stardust mission for NASA's Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, developed and operates the spacecraft.

For information about the Stardust mission on the Web, visit <http://www.nasa.gov/stardust>.

For information about NASA and agency programs on the Web, visit <http://www.nasa.gov/home>.

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News Release: 2005-170

December 5, 2005

NASA's Mars Rovers Continue to Explore and Amaze

NASA's durable twin Mars rovers have successfully explored the surface of the mysterious red planet for a full Martian year (687 Earth days). Opportunity starts its second Martian year Dec. 11; Spirit started its new year three weeks ago. The rovers' original mission was scheduled for only three months.

"The rovers went through all of the Martian seasons and are back to late summer," said Dr. John Callas of NASA's Jet Propulsion Laboratory, Pasadena, Calif. He is deputy rover project manager. "We're preparing for the challenge of surviving another Martian winter."

Both rovers keep finding new variations of bedrock in areas they are exploring on opposite sides of Mars. The geological information they collect increases evidence about ancient Martian environments including periods of wet, possibly habitable conditions.

Spirit is descending from the top of "Husband Hill" to examine a platform-like structure seen from the summit. It will then hurry south to another hill in time to position itself for maximum solar-cell output during the winter.

"Our speed of travel is driven as much by survival as by discovery, though the geology of Husband Hill continues to fascinate, surprise, puzzle and delight us," said Dr. Steve Squyres of Cornell University, Ithaca, N.Y., principal investigator for the rover's science instruments. "We've got this dramatic topography covered with sand and loose boulders, then, every so often, a little window into the bedrock underneath."

From the composition and texture of more than six different types of rock inspected, scientists deduced what this part of Mars was like long ago. "It was a hot, violent place with volcanic explosions and impacts," Squyres said. "Water was around, perhaps localized hot springs in some cases and trace amounts of water in other cases."

Aided by a good power supply from Spirit's solar cells, researchers have been using the rover at night for astronomical observations. One experiment watched the sky during a meteor shower as Mars passed through the debris trail left by a passage of Halley's comet. "We're taking advantage of a unique opportunity to do some bonus science we never anticipated we would be able to do," said Cornell's Dr. Jim Bell, lead scientist for the rovers' panoramic cameras

Opportunity is examining bedrock exposures along a route between Endurance and Victoria craters. It recently reached what appears to be a younger layer of bedrock than examined inside Endurance. In Endurance, the lowest layers of bedrock were deposited as windblown dunes. Some of the upper layers were deposited as underwater sediments, indicating a change from drier to wetter conditions over time.

The bedrock Opportunity began seeing about two-thirds of the way to Victoria appears to lie higher than the upper layers at Endurance, but its texture is more like the lowest layer, petrified sand dunes. This suggests the change from drier to wetter environmental conditions may have been cyclical.

Iron-rich granules are abundant in all the layers at Endurance but are much smaller in the younger bedrock. These granules were formed by effects of water soaking the rocks. One possibility for why they are smaller is these layers might have spent less time wet. Another is the material in these layers might have had a different chemistry to begin with.

Rover researchers are presenting their latest data today during the American Geophysical Union meeting in San Francisco. Images and information about the rovers and their discoveries are available on the Web at: http://www.nasa.gov/vision/universe/solarsystem/mer_main.html . For more information about NASA and agency programs on the Web, visit: <http://www.nasa.gov/home> .

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News Release: 2005-175

Dec. 20, 2005

Partial Ingredients for DNA and Protein Found Around Star

NASA's Spitzer Space Telescope has discovered some of life's most basic ingredients in the dust swirling around a young star. The ingredients – gaseous precursors to DNA and protein – were detected in the star's terrestrial planet zone, a region where rocky planets such as Earth are thought to be born.

The findings represent the first time that these gases, called acetylene and hydrogen cyanide, have been found in a terrestrial planet zone outside of our own.

"This infant system might look a lot like ours did billions of years ago, before life arose on Earth," said Fred Lahuis of Leiden Observatory in the Netherlands and the Dutch space research institute called SRON. Lahuis is lead author of a paper to be published in the Jan. 10 issue of the *Astrophysical Journal Letters*.

Lahuis and his colleagues spotted the organic, or carbon-containing, gases around a star called IRS 46. The star is in the Ophiuchus (pronounced OFF-ee-YOO-kuss), or "snake carrier,"

constellation about 375 light-years from Earth. This constellation harbors a huge cloud of gas and dust in the process of a major stellar baby boom. Like most of the young stars here and elsewhere, IRS 46 is circled by a flat disk of spinning gas and dust that might ultimately clump together to form planets.

When the astronomers probed this star's disk with Spitzer's powerful infrared spectrometer instrument, they were surprised to find the molecular "barcodes" of large amounts of acetylene and hydrogen cyanide gases, as well as carbon dioxide gas. The team observed 100 similar young stars, but only one, IRS 46, showed unambiguous signs of the organic mix.

"The star's disk was oriented in just the right way to allow us to peer into it," said Lahuis.

The Spitzer data also revealed that the organic gases are hot. So hot, in fact, that they are most likely located near the star, about the same distance away as Earth is from our sun.

"The gases are very warm, close to or somewhat above the boiling point of water on Earth," said Dr. Adwin Boogert of the California Institute of Technology, Pasadena. "These high temperatures helped to pinpoint the location of the gases in the disk."

Organic gases such as those found around IRS 46 are found in our own solar system, in the atmospheres of the giant planets and Saturn's moon Titan, and on the icy surfaces of comets. They have also been seen around massive stars by the European Space Agency's Infrared Space Observatory, though these stars are thought to be less likely than sun-like stars to form life-bearing planets.

Here on Earth, the molecules are believed to have arrived billions of years ago, possibly via comets or comet dust that rained down from the sky. Acetylene and hydrogen cyanide link up together in the presence of water to form some of the chemical units of life's most essential compounds, DNA and protein. These chemical units are several of the 20 amino acids that make up protein and one of the four chemical bases that make up DNA.

"If you add hydrogen cyanide, acetylene and water together in a test tube and give them an appropriate surface on which to be concentrated and react, you'll get a slew of organic compounds including amino acids and a DNA purine base called adenine," said Dr. Geoffrey Blake of Caltech, a co-author of the paper. "And now, we can detect these same molecules in the planet zone of a star hundreds of light-years away."

Follow-up observations with the W.M. Keck Telescope atop Mauna Kea in Hawaii confirmed the Spitzer findings and suggested the presence of a wind emerging from the inner region of IRS 46's disk. This wind will blow away debris in the disk, clearing the way for the possible formation of Earth-like planets.

The Jet Propulsion Laboratory manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate, Washington. Science operations are conducted at the Spitzer Science Center at Caltech. JPL is a division of Caltech. Spitzer's infrared spectrograph was built by Cornell University, Ithaca, N.Y. Its development was led by Dr. Jim Houck of Cornell.

For graphics and more information about Spitzer, visit <http://www.spitzer.caltech.edu/spitzer> .
For more information about NASA and agency programs on the Web, visit <http://www.nasa.gov/home/> .

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Image Advisory: 2005-171

December 6, 2005

NASA's Cassini Images Reveal Spectacular Evidence of an Active Moon

Jets of fine, icy particles streaming from Saturn's moon Enceladus were captured in recent images from NASA's Cassini spacecraft. The images provide unambiguous visual evidence that the moon is geologically active.

"For planetary explorers like us, there is little that can compare to the sighting of activity on another solar system body," said Dr. Carolyn Porco, Cassini imaging team leader at the Space Science Institute in Boulder, Colo. "This has been a heart-stopper, and surely one of our most thrilling results."

The Cassini images clearly show multiple jets emanating from the moon's south polar region. Based on earlier data, scientists strongly suspected these jets arise from warm fractures in the region. The fractures, informally dubbed "tiger stripes," are viewed essentially broadside in the new images.

The fainter, extended plume stretches at least 186 kilometers (300 miles) above the surface of Enceladus, which is only 186 kilometers wide. Cassini flew through the plume in July, when it passed a few hundred kilometers above the moon. During that flyby, Cassini's instruments measured the plume's constituent water vapor and icy particles.

Imaging team members analyzed images of Enceladus taken earlier this year at similar viewing angles. It was a rigorous effort to demonstrate that earlier apparitions of the plumes, seen as far back as January, were in fact real and not due to imperfections in the camera.

The recent images were part of a sequence planned to confirm the presence of the plumes and examine them in finer detail. Imaging team member Dr. Andrew Ingersoll from the California Institute of Technology in Pasadena, said, "I think what we're seeing are ice particles in jets of water vapor that emanate from pressurized vents. To form the particles and carry them aloft, the vapor must have a certain density, and that implies surprisingly warm temperatures for a cold body like Enceladus."

Imaging scientists are comparing the new views to earlier Cassini data in hopes of arriving at a more detailed, three-dimensional picture of the plumes and understanding how activity has come about on such a small moon. They are not sure about the precise cause of the moon's unexpected geologic vitality.

"In some ways, Enceladus resembles a huge comet," said Dr. Torrence Johnson, imaging team member from NASA's Jet Propulsion Laboratory in Pasadena. "Only, in the case of Enceladus, the energy source for the geyser-like activity is believed to be due to internal heating by perhaps radioactivity and tides rather than the sunlight which causes cometary jets." The new data also give yet another indication of how Enceladus keeps supplying material to Saturn's gossamer E ring.

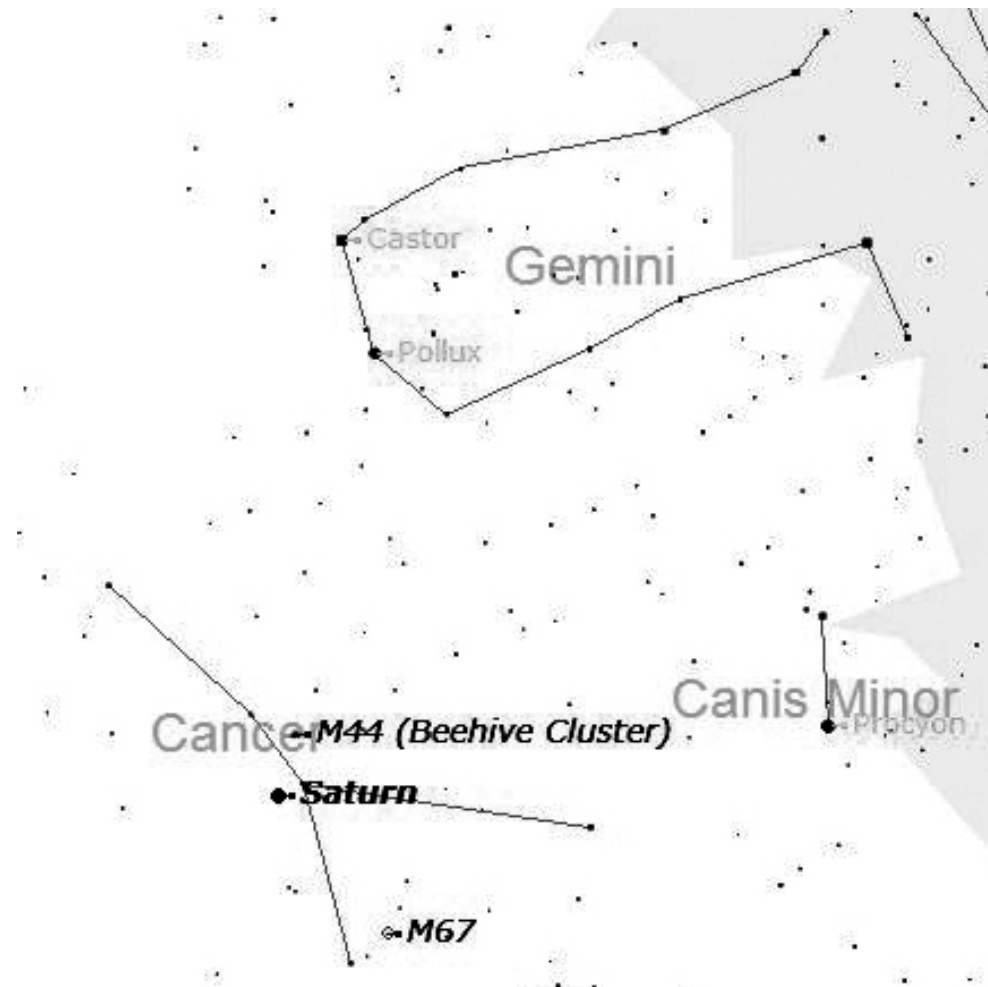
The Cassini-Huygens mission is a cooperative project of NASA, the European and Italian Space Agencies. JPL, a division of the Caltech, manages the mission for NASA's Science Mission Directorate. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging team is based at the Space Science Institute. For the latest Cassini images on the Web, including a time sequence showing the plumes, visit: <http://saturn.jpl.nasa.gov>, <http://www.nasa.gov/cassini> or <http://ciclops.org>.

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Mid Evening Observing Highlights for January

Saturn can be found in the eastern sky below Gemini. It is just below the open cluster M44 in

Cancer. Mars is high in the sky and almost directly overhead. Orion is prominent in the eastern sky. Below the three stars in Orion's belt the Orion Nebula (M42) can be seen. Auriga and Taurus are high in the sky. The bright star Aldebaran can be found in Taurus in the eastern part of the sky. The Andromeda Galaxy (M31) is in the western sky. The Great Square 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 14th and new moon is on January 29th. The image below shows the location of Saturn in the eastern sky.



BARLOW BOB'S CORNER

Barlow Bob is a member of the Rockland Astronomy Club.

The Northeast Astronomy Forum will be held on May 6th and 7th this year. For more details go to the link below.

<http://www.rocklandastronomy.com/neaf.htm>

NASA Space Place

A New View of the Andromeda Galaxy

By Dr. Tony Phillips and Patrick L. Barry

This is a good time of year to see the Andromeda galaxy. When the sun sets and the sky fades to black, Andromeda materializes high in the eastern sky. You can find it with your unaided eye. At first glance, it looks like a very dim, fuzzy comet, wider than the full moon. Upon closer inspection through a backyard telescope—wow! It's a beautiful spiral galaxy.

At a distance of “only” 2 million light-years, Andromeda is the nearest big galaxy to the Milky Way, and astronomers know it better than any other. The swirling shape of Andromeda is utterly familiar.

Not anymore. A space telescope named GALEX has captured a new and different view of Andromeda. According to GALEX, Andromeda is not a spiral but a ring.

GALEX is the “Galaxy Evolution Explorer,” an ultraviolet telescope launched by NASA in 2003. Its mission is to learn how galaxies are born and how they change with age. GALEX's ability to see ultraviolet (UV) light is crucial; UV radiation comes from newborn stars, so UV images of galaxies reveal star birth—the central process of galaxy evolution.

GALEX's sensitivity to UV is why Andromeda looks different. To the human eye (or to an ordinary visible-light telescope), Andromeda remains its usual self: a vast whirlpool of stars, all ages and all sizes. To GALEX, Andromeda is defined by its youngest, hottest stars. They are concentrated in the galaxy's core and scattered around a vast ring some 150,000 light years in diameter. It's utterly *unfamiliar*.

“Looking at familiar galaxies with a new wavelength, UV, allows us to get a better understanding of the processes affecting their evolution,” says Samuel Boissier, a member of the GALEX team at the Observatories of the Carnegie Institution of Washington.

Beyond Andromeda lies a whole universe of galaxies—spirals, ellipticals and irregulars, giants and dwarfs, each with its own surprising patterns of star formation. To discover those patterns, GALEX has imaged hundreds of nearby galaxies. Only a few, such as Andromeda, have been analyzed in complete detail. “We still have a lot of work to do,” says Boissier, enthusiastically.

GALEX has photographed an even greater number of distant galaxies—“some as far away as 10 billion light-years,” Boissier adds—to measure how the rate of new star formation has changed over the universe's long history. Contained in those terabytes of data is our universe's “life story.” Unraveling it will keep scientists busy for years to come.

For more about GALEX, visit www.galex.caltech.edu. Kids can see how to make a galactic art project at spaceplace.nasa.gov/en/kids/galex/art.shtml.



Caption:
The GALEX telescope took this UV image of the Andromeda galaxy (M31), revealing a surprising shape not apparent in visible light.