



## Club News January, 2006

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

On January 21<sup>st</sup> the club held it's first "dinner and a movie" meeting at Morgan Outdoors in Livingston Manor. The meeting consisted of a viewing of a part of the PBS Nova Origins series entitled "Back to the Beginning". It was narrated by Dr. Neil deGrasse Tyson who is the director of the Hayden Planetarium as well as a pizza dinner. A question and discussion segment that was led by Jim McKeegan was held at the half way point of the movie as well as at the end. A group of over forty people attended. The movie was well received and seemed to spark a great deal of interest from the audience. Another meeting in this format is tentatively scheduled for February 11<sup>th</sup>. An announcement for this will be sent out in the near future. Special thanks goes out to Lisa Lyons who hosted the event and Alan Chao who set up the computer and sound system to show the DVD. The image below was taken by Lisa Lyons and shows part of the audience that evening. The image after that was taken by John Kocijanski and shows Jim McKeegan leading the intermission discussion.





In the near future a notice will be sent out to some members asking for dues from those who have not renewed their membership. The notice will give an opportunity to renew your membership or decline and leave the club. Please respond to the notice so we can update our membership.

The January 28<sup>th</sup> observation session was canceled despite good sky conditions. No one responded that they would attend the session when an email was sent out.

The February observation sessions at Walnut Mountain Park are scheduled for the 4<sup>th</sup> and 25<sup>th</sup>.

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](mailto: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: 2006-012

January 18, 2006

**Scientists Confirm Comet Samples; Briefing Set for Thursday**

Scientists have confirmed that particles from a comet and interstellar dust have been returned to Earth by NASA's Stardust mission.

The science team opened the Stardust sample return capsule on Tuesday in a special facility at NASA's Johnson Space Center, Houston.

"The collection of cometary particles has exceeded our expectations," said Dr. Donald Brownlee, Stardust principal investigator from the University of Washington, Seattle. "We were absolutely thrilled to see thousands of impacts on the aerogel."

Inside the capsule, a tennis racket-like sample tray holds the particles captured as the spacecraft flew within (240 kilometers) 149 miles of comet Wild 2 in January 2004. The opposite side of the tray holds interstellar dust particles caught streaming through the solar system by Stardust during its seven-year journey. The team is analyzing the particle capture cells and removing individual grains of comet and interstellar dust. The particles will eventually be sent to select investigators worldwide.

Leaders of the science and curation teams will participate in a news conference Thursday, January 19, at 8 a.m. Pacific Time to discuss the comet and interstellar dust samples. The briefing will originate from the Johnson Space Center, 2101 NASA Parkway, Houston, and will be broadcast live on NASA Television and the Web. Question-and-answer capability for reporters is available at participating NASA centers.

Participants in the Thursday news conference include:

- Dr. Donald Brownlee, principal investigator, University of Washington,
- Dr. Peter Tsou, deputy principal investigator, Jet Propulsion Laboratory, Pasadena, Calif.
- Dr. Michael Zolensky, Stardust curator and co-investigator, Johnson Space Center
- Dr. Carlton Allen, astromaterials curator, Johnson Space Center

NASA TV's Public, Education and Media channels are available on an MPEG-2 digital C-band signal accessed via satellite AMC-6, at 72 degrees west longitude, transponder 17C, 4040 MHz, vertical polarization. In Alaska and Hawaii, they're on AMC-7 at 137 degrees west longitude, transponder 18C, at 4060 MHz, horizontal polarization. A Digital Video Broadcast compliant Integrated Receiver Decoder is required for reception. For digital downlink information for each NASA TV channel, and access to NASA TV's

Public Channel on the Web, visit: <http://www.nasa.gov/ntv> .

JPL manages the Stardust mission for NASA's Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, developed the spacecraft. The Johnson Space Center is home to the curation team and the facility where the Stardust particles are stored.

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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Image Advisory: 2006-005

January 11, 2006

### **Cartwheel Galaxy Makes Waves in New NASA Image**

A new image from NASA's Galaxy Evolution Explorer completes a multi-wavelength, neon-colored portrait of the enormous Cartwheel galaxy after a smaller galaxy plunged through it, triggering ripples of sudden, brief star formation.

The false-color composite image, available at <http://www.galex.caltech.edu/> , shows the Cartwheel galaxy as seen by Galaxy Evolution Explorer in ultraviolet light (blue); the Hubble Space Telescope in visible light (green); the Spitzer Space Telescope in infrared (red); and the Chandra X-ray Observatory (purple).

"The dramatic plunge has left the Cartwheel galaxy with a crisp, bright ring around a zone of relative calm," said astronomer Phil Appleton of the California Institute of Technology, Pasadena, Calif. "Usually a galaxy is brighter toward the center, but the ultraviolet view indicates the collision actually smoothed out the interior of the galaxy, concentrating older stars and dust into the inner regions. It's like the calm after the storm of star formation." The outer ring, which is bigger than the entire Milky Way galaxy, appears blue and violet in the image.

Recently-observed features include concentric rings rippling out from the impact area in a series of star formation waves, ending in the outermost ring. "It's like dropping a stone into a pond, only in this case, the pond is the galaxy, and the wave is the compression of gas," said Appleton. "Each wave represents a burst of star formation, with the youngest stars found in the outer ring."

Previously, scientists believed the ring marked the outermost edge of the galaxy, but the

latest Galaxy Evolution Explorer observations detect a faint disk, not visible in this image, that extends to twice the diameter of the ring. This means the Cartwheel is a monstrous 2.5 times the size of the Milky Way.

Most galaxies have only one or two bright X-ray sources, usually associated with gas falling onto a black hole from a companion star. The Cartwheel has a dozen. Appleton said that makes sense, because black holes thrive in areas where massive stars are forming and dying fast.

The Cartwheel galaxy is one of the brightest ultraviolet energy sources in the local universe. In some visible-light images, it appears to have spokes. Appleton is presenting his finding today at the 207th meeting of the American Astronomical Society in Washington. His research collaborators included Armando Gil de Paz of Universidad Complutense, Madrid, Spain; and Barry Madore of The Observatories of the Carnegie Institution of Washington, Pasadena, Calif. The team's observations were a follow-up to studies made by the Galaxy Evolution Explorer science team's Nearby Galaxy Survey.

Additional information about Galaxy Evolution Explorer is online at <http://www.galex.caltech.edu> .

Caltech leads the Galaxy Evolution Explorer mission and is responsible for science operations and data analysis. NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the mission and built the science instrument. The mission was developed under NASA's Explorers Program managed by the Goddard Space Flight Center, Greenbelt, Md. South Korea and France are international partners in the mission.

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News Release: 2006-006

January 11, 2006

### **NASA's Spitzer Finds Possible Comet Dust Around Dead Star**

NASA's Spitzer Space Telescope has spotted what may be comet dust sprinkled around the white dwarf star G29-38, which died approximately 500 million years ago.

The findings suggest the dead star, which most likely consumed its inner planets, is still orbited by a ring of surviving comets and possibly outer planets. This is the first observational evidence that comets can outlive their suns.

"Astronomers have known for decades that stars are born, have an extended middle age, and then wither away or explode. Spitzer is helping us understand how planetary systems evolve in tandem with their parent stars," said David Leisawitz, NASA's Spitzer program scientist.

Astronomers believe white dwarfs are shrunken skeletons of stars that were once similar to Earth's sun. As the stars aged over billions of years, they grew brighter and eventually

swelled in size to become red giants. Millions of years later, the red giants shed their outer atmospheres, leaving behind white dwarfs.

If any planets did orbit in these systems, the red giants would have engulfed at least the inner ones. Only distant outer planets and an orbiting icy outpost of comets would have survived.

"The dust seen by Spitzer around G29-38 was probably generated relatively recently when one such outlying comet may have been knocked into the inner region of the system and ripped into dust shreds by the tidal forces of the star," said astronomer William Reach of the Spitzer Science Center at the California Institute of Technology in Pasadena, Calif.

Prior to the Spitzer findings, astronomers studying G29-38 noticed an unusual and unknown source of infrared light. Spitzer, with its powerful infrared spectrometer, was able to break this light apart, revealing its molecular makeup. These data told astronomers the light was coming from the same types of dusty minerals found in comets in our solar system.

"We detected a large quantity of very small, dirty silicate grains," said astronomer Marc Kuchner of NASA's Goddard Space Flight Center, Greenbelt, Md. "The size of these grains tells us they are probably from comets and not other planetary bodies."

In our own solar system, comets reside in the cold outer fringes in regions known as the Kuiper Belt and Oort Cloud. Only when something disturbs their orbits, such as another comet or an outer planet, do they begin periodic journeys into the sun's warmer neighborhood. However, these trips to the tropics often end in destruction. Comets slowly disintegrate as they pass close to the sun, or they crash into it. They also occasionally crash into planets, as comet Shoemaker-Levy 9 did when it plunged into Jupiter.

Though the dust seen by Spitzer around the white dwarf is most likely the remains of such a torn-up comet, there may be other explanations. One possibility is that a second wave of planets formed long after the death of the star, leaving a dusty construction zone.

Kuchner presented his findings today at the 207th meeting of the American Astronomical Society in Washington. The data were also published in the December 20, 2005, issue of the *Astrophysical Journal*.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., manages the Spitzer Space Telescope mission for the agency's Science Mission Directorate. Science operations are conducted at the Spitzer Science Center at Caltech. JPL is a division of Caltech.

For artist's concepts and graphics, visit <http://www.spitzer.caltech.edu/Media/releases/ssc2006-04/release.shtml> .

For additional information about Spitzer on the Web, 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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News Release: 2006-004  
2006

January 10,

### ***Spitzer Captures our Galaxy's Bustling Center***

A new infrared mosaic from NASA's Spitzer Space Telescope offers a stunning view of the stellar hustle and bustle that takes place at our Milky Way galaxy's center. The picture shows throngs of mostly old stars, on the order of hundreds of thousands, amid fantastically detailed clouds of glowing dust lit up by younger, massive stars.

"With Spitzer, we can peer right into the heart of our own galaxy and see breathtaking detail," said Dr. Susan Stolovy of the Spitzer Science Center at the California Institute of Technology in Pasadena. "This picture is crammed with fascinating features that we have just begun to explore."

The image is available online at <http://www.spitzer.caltech.edu/spitzer> .

The Milky Way's core is indeed a very busy place. Stars are packed together like subway riders as they race around the supermassive black hole that lies at the center. Our sun is located 26,000 light-years away in a more peaceful, spacious neighborhood, out in the galactic suburbs. It circles the galaxy about every 225 million years, which amounts to 20 trips over the course of its 4.5-billion-year lifetime. In contrast, stars at the galactic center complete one lap in only a few million years or less.

"One question we hope to address is how stars can form so efficiently in a place like the galactic center," said Stolovy. "Stars there are still able to form in an environment with unusually strong magnetic fields and tidal shear forces."

Viewing the center of the Milky Way from Earth can be difficult because the plane of the galaxy's spiral disk is filled with cold dust. Visible light coming from this distant region is virtually impossible to observe because dust dims it by a factor of one trillion. But infrared light can shine through this dust. The infrared light in this Spitzer view has wavelengths about 10 times longer than what the human eye can see, and is dimmed only about four times.

This infrared advantage, combined with Spitzer's superb image quality, has resulted in the deepest and sharpest view yet of an expansive stretch of the galactic center. The pictured region, located in the Sagittarius constellation, is 900 light-years across. It covers the same area on the sky that a grid of four by three full moons would occupy.

Features within the new mosaic include dust clouds of a dizzying variety, such as glowing filaments, wind-blown lobes flapping outward from the plane of the galaxy, and finger-like pillars. The Spitzer image also shows newborn stars just beginning to break out of their dark and dusty cocoons, and exquisitely detailed dark clouds so dense they are opaque even in infrared wavelengths. Some of these features are located near the physical center of our galaxy, while others lie closer to Earth.

"Our Spitzer data, combined with data obtained by other telescopes, will allow us to determine which of these objects are truly at the galactic center, and which are in spiral arms along the way," said Stolovy. "This survey will help us to better understand the mass distribution and structure of our own galaxy and how it compares to other galaxies."

Stolovy and her colleagues are particularly thrilled about the high quality of the Spitzer image when they remember the challenges they overcame in obtaining it. The galactic center is very bright in infrared wavelengths, and could have potentially saturated Spitzer's sensitive detectors. The astronomers solved this problem by taking advantage of Spitzer's ability to take very short exposures. They collected the thousands of snapshots that make up their final mosaic in just under 16 hours.

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. NASA's Goddard Space Flight Center, Greenbelt, Md., built Spitzer's infrared array camera, which took the new image. The instrument's principal investigator is Dr. Giovanni Fazio of the Harvard-Smithsonian Center for Astrophysics.

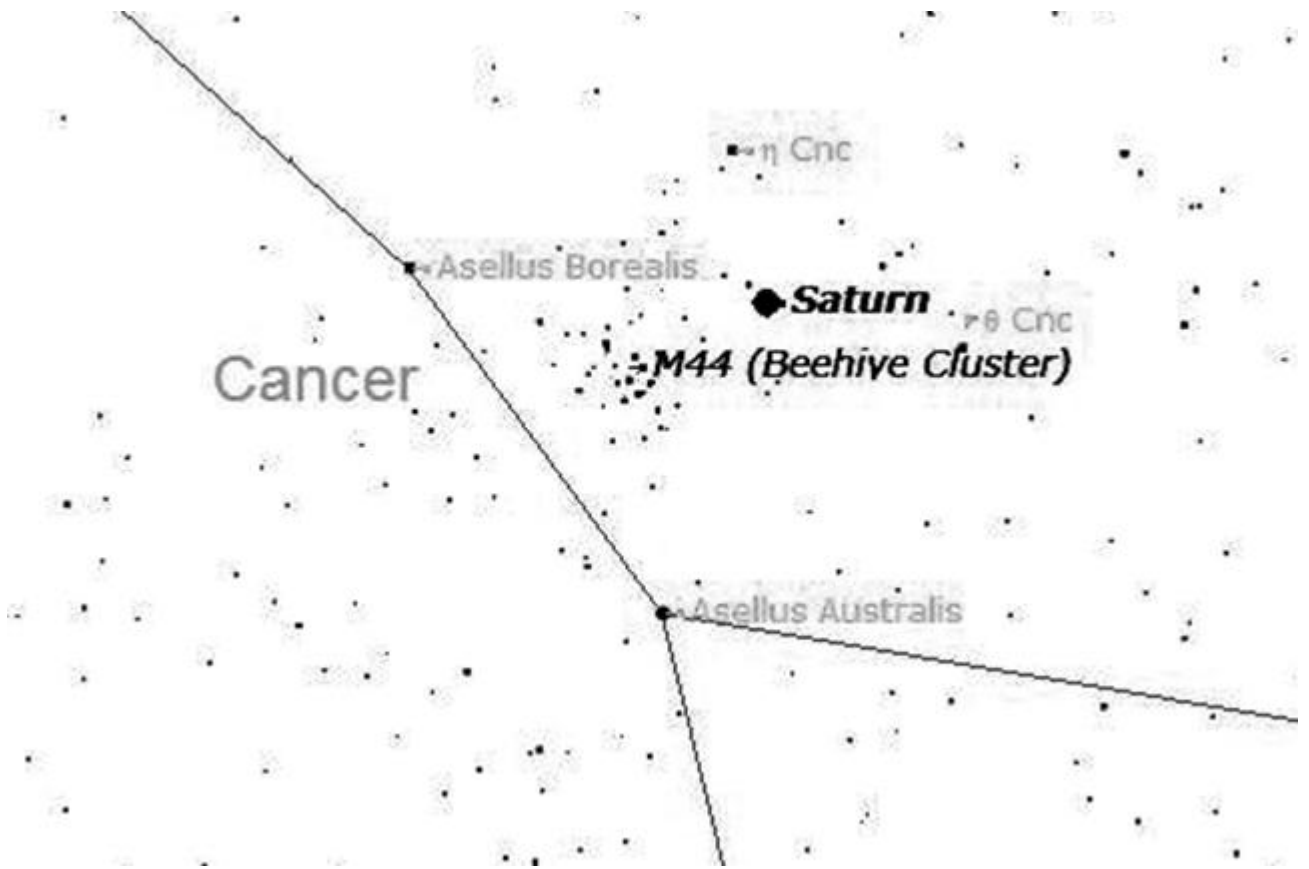
Stolovy presented the image today during the 207th meeting of the American Astronomical Society in Washington, D.C.

Additional graphics and more information about Spitzer is at <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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### ***Mid Evening Observing Highlights for February***

Saturn is can be found in the eastern sky below the constellation Gemini next to the open cluster M44 (the Beehive Cluster) in Cancer. Mars is high in the western sky below the Pleiades. Orion is prominent in the southern sky as is the Winter Triangle of Betelgeuse, Sirius, and Procyon. Look for the open star clusters M41 just south of Sirius and M35 in Gemini. Leo is rising in the east. The Big Dipper is standing on its handle in the northeast. The galaxies M81 and M82 can be found just west of the Pointer Stars in the Big Dipper (Dubhe and Merak). New moon is on February 28th and full moon is on February 13<sup>th</sup>. The image below shows the location of Saturn next to M44.



*NASA Space Place*

## **Snowstorm on Pluto**

by Dr. Tony Phillips

There's a nip in the air. Outside it's beginning to snow, the first fall of winter. A few delicate flakes tumble from the sky, innocently enough, but this is no mere flurry.

Soon the air is choked with snow, falling so fast and hard it seems to pull the sky down with it. Indeed, that's what happens. Weeks later when the storm finally ends the entire atmosphere is gone. Every molecule of air on your planet has frozen and fallen to the ground.

*That* was a snowstorm—on Pluto.

Once every year on Pluto (1 Pluto-year = 248 Earth-years), around the beginning of winter, it gets so cold that the atmosphere freezes. Air on Pluto is made mainly of nitrogen with a smattering of methane and other compounds. When the temperature dips to about 32 K (-240 C), these molecules crystallize and the atmosphere comes down.

“The collapse can happen quite suddenly,” says Alan Stern of the Southwest Research Institute. “Snow begins to fall, the surface reflects more sunlight, forcing quicker cooling, accelerating the snowfall. It can all be over in a few weeks or months.”

Researchers believe this will happen sometime during the next 10 to 20 years. Pluto is receding from the warmth of the Sun, carried outward by its 25% elliptical orbit. Winter is coming.

So is New Horizons. Stern is lead scientist for the robotic probe, which left Earth in January bound for Pluto. In 2015 New Horizons will become the first spacecraft to visit that distant planet. The question is, will it arrive before the snowstorm?

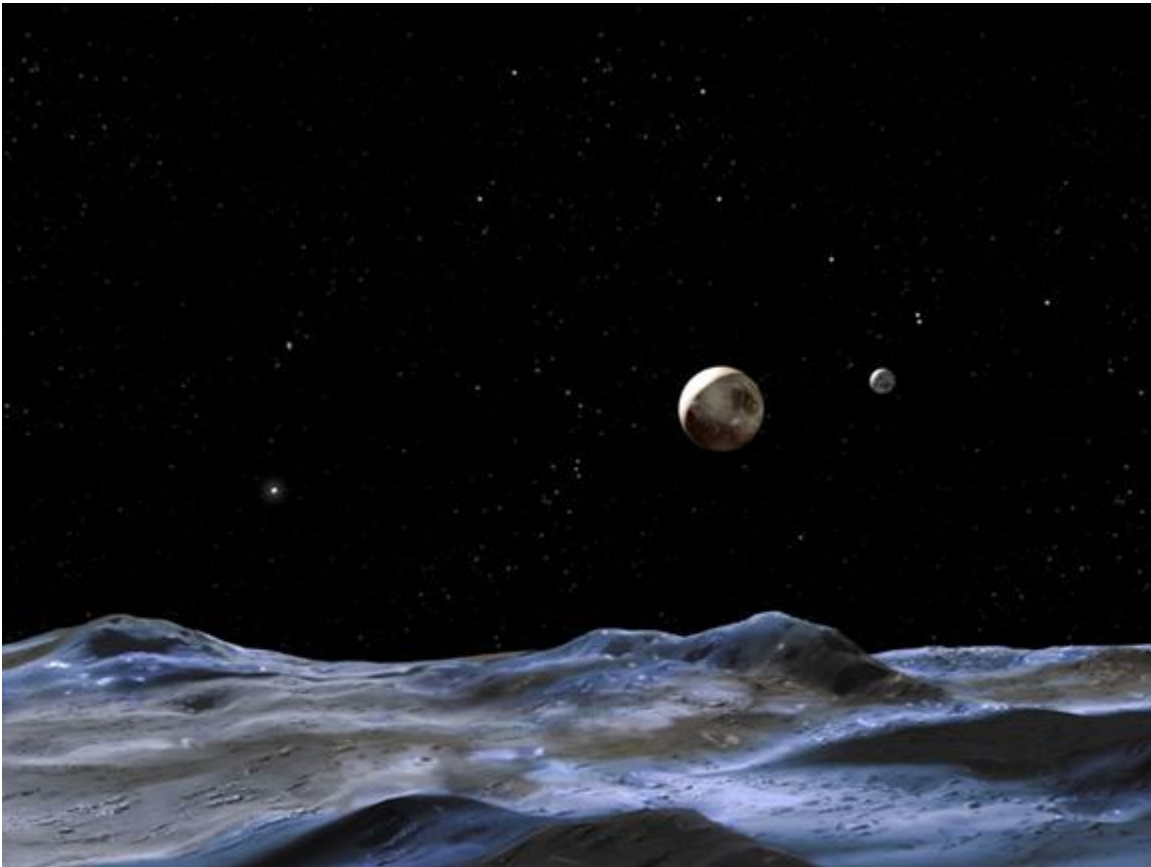
“We hope so,” says Stern. The spacecraft is bristling with instruments designed to study Pluto's atmosphere and surface. “But we can't study the atmosphere if it's not there.” Furthermore, a layer of snow on the ground (“probably a few centimeters deep,” estimates Stern) could hide the underlying surface from New Horizon's remote sensors.

Stern isn't too concerned: “Pluto's atmosphere was discovered in 1988 when astronomers watched the planet pass in front of a distant star—a stellar occultation.” The star, instead of vanishing abruptly at Pluto's solid edge, faded slowly. Pluto was “fuzzy;” it had air. “Similar occultations observed since then (most recently in 2002) reveal no sign of [impending] collapse,” says Stern. On the contrary, the atmosphere appears to be expanding, puffed up by lingering heat from Pluto's waning summer.

Nevertheless, it's a good thing New Horizons is fast, hurtling toward Pluto at 30,000 mph. Winter. New Horizons. Only one can be first. The race is on....

Find out more about the New Horizons mission at <http://pluto.jhuapl.edu> . Kids can learn amazing facts about Pluto at [spaceplace.nasa.gov/en/kids/pluto](http://spaceplace.nasa.gov/en/kids/pluto).

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



*This artist's rendering shows how Pluto and two of its possible three moons might look from the surface of the third moon. Credit: NASA/ESA and G. Bacon (STSci)*