Astronomy Club News
December, 2006

John Kocijanski…. Editor

The November 25th observation session at Walnut Mountain was held. Thirteen people attended. The skies were clear but a bit hazy near the horizon. The group was able to view a number of deep sky objects including the open star clusters M36, M37, and M38 in Auriga as the galaxies M31, M32, and M110 in Andromeda. The highlight of the evening was seeing the Orion Nebula. As it rose higher in the sky above the haze a more detailed view was possible. A few meteors were also seen that could have been Leonids.

The November 18th observation session was canceled due to poor weather.

A movie night is in planned for December 9th at Morgan Outdoors in Livingston Manor. The following is a press release for the event.

It's a Wonderful Life, Astronomy Style

Livingston Manor, NY On **Saturday, December 9** from **6:30- 8:00pm**, the Catskill A**stronomy Club** and **Morgan Outdoors** will host a showing of the award-winning PBS series Cosmos, Episode 4 ***"Heaven and Hell"*** at Morgan Outdoors, 46 Main Street, Livingston Manor, NY. This is first in a series of "dinner and a movie" nights this winter. The film screening is accompanied by pizza, salad and soft drinks, with breaks for discussion.

This episode of Cosmos explores a descent through the hellish atmosphere of Venus to explore its broiling surface and serves as a warning to our world about the possible consequences of the increasing greenhouse effect. Dr. Carl Sagan leads us on a tour of our solar system to see how other heavenly bodies have suffered from various cosmic catastrophes.

This program is suitable for children age 10 and up. If you have a budding interest in astronomy, this is a good time to meet Catskill Astronomy Club members and learn about their monthly public viewing events on Walnut Mountain in Liberty.

The cost of the dinner & film event is a $7.00 donation to the Catskill Astronomy Club, only $5.00 per person for Club members and families of 3 or more. **Advance registration is required**, by calling Morgan Outdoors at (845)439-5507 by 12:00pm Saturday, December 9th. Seating is limited. Morgan Outdoors is located at 46 Main Street in Livingston Manor. Hours are 10 – 6pm Mon, Thur, Fri, Sat. and 10-3 Sunday.

Three PBS Nova dvds have been purchased by the club for use in future movie events. The following is a summary of the each one taken from the WGBH/PBS website.

Death Star

They are so bright, they are a billion billion times more luminous than the sun. They are so distant, their light takes billions of years just to reach Earth. These amazingly violent explosions-or death stars-may even have the power to

eradicate life in an entire galaxy. See how these celestial phenomena can teach us about the dawn of the universe. And hear a controversial theory of how a gamma ray burst somewhere in our own galaxy could destroy life on Earth.

Monster of the Milky Way

Join NOVA on a mind-bending hunt for a monster lurking at the heart of our Milky Way galaxy. Astronomers are closing in on one of the most destructive objects in the universe, a supermassive black hole and it's hiding right in the center of our own galaxy. Eventually, it will blast jets of radiation millions of miles its space, incinerating everything in its neighborhood, including planet Earth. For a long time, black holes were dismissed as pure science fiction. Even Albert Einstein could not bring himself to accept them, despite pioneering the theory of relativity that predicted their existence. But recently, scientists have found convincing evidence that black holes are not only real but are crucial to the life and death of galaxies everywhere in the cosmos. From the explosive birth of a black hole to its cannibalistic death throes, NOVA investigates one of the universe's darkest secrets. With striking special effects, Monster of the Milky Way takes viewers on a scientifically accurate voyage into the belly of a supermassive blackhole. When will it erupt and destroy the Milky Way?

Saturn's Titan - Voyage to the Mystery Moon

A billion miles from Earth, Titan is a tantalizing alien world. Could clues to the origins of life or even living microbes be hidden under its thick orange clouds? Saturn's largest moon has a soupy atmosphere resembling Earth's billions of years ago, and may help reveal how life got started and whether it exists on other worlds. But discovering Titan's secrets demands a bold and ambitious space mission. It took seven years for top US and European scientists to design and build the ingenious Cassini-Huygens space probe. Take a front-row seat at Mission Control to watch the launch and the crises that threaten the probe on its perilous voyage across the solar system. Along the way, Cassini captures astonishing images of Saturn's rings and many new clues to their mysterious beauty. The climax comes with the touchdown on Titan. As Huygens penetrates the orange haze, it unveils a bizarre landscape drenched in liquid methane, more surprising than the scientists ever suspected. Filled with incredible images beamed back during the mission, NOVA takes a dramatic voyage of discovery to an exotic world unimaginably far from our own.

The next December club observation session after the 16th is on the 23rd at Walnut Mountain.

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 a Meade eight 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: 2006-137 Nov. 9, 2006

NASA Sees into the Eye of a Monster Storm on Saturn

NASA's Cassini spacecraft has seen something never before seen on another planet -- a hurricane-like storm at Saturn's south pole with a well-developed eye, ringed by towering clouds.

The "hurricane" spans a dark area inside a thick, brighter ring of clouds. It is approximately 8,000 kilometers (5,000

miles) across, or two thirds the diameter of Earth.

"It looks like a hurricane, but it doesn't behave like a hurricane," said Dr. Andrew Ingersoll, a member of Cassini's imaging team at the California Institute of Technology, Pasadena. "Whatever it is, we're going to focus on the eye of this storm and find out why it's there."

A movie taken by Cassini's camera over a three-hour period reveals winds around Saturn's south pole blowing clockwise at 550 kilometers (350 miles) per hour. The camera also saw the shadow cast by a ring of towering clouds surrounding the pole, and two spiral arms of clouds extending from the central ring. These ring clouds, 30 to 75 kilometers (20 to 45 miles) above those in the center of the storm, are two to five times taller than the clouds of thunderstorms and hurricanes on Earth.

Eye-wall clouds are a distinguishing feature of hurricanes on Earth. They form where moist air flows inward across the ocean's surface, rising vertically and releasing a heavy rain around an interior circle of descending air that is the eye of the storm itself. Though it is uncertain whether such moist convection is driving Saturn's storm, the dark "eye" at the pole, the eye-wall clouds and the spiral arms together indicate a hurricane-like system.

Distinctive eye-wall clouds had not been seen on any planet other than Earth. Even Jupiter's Great Red Spot, much larger than Saturn's polar storm, has no eye or eye-wall and is relatively calm at the center.

This giant Saturnian storm is apparently different fromhurricanes on Earth because it is locked to the pole and does not drift around. Also, since Saturn is a gaseous planet, the storm forms without an ocean at its base.

In the Cassini imagery, the eye looks dark at infrared wavelengths where methane gas absorbs the light and only the highest clouds are visible.

"The clear skies over the eye appear to extend down to a level about twice as deep as the usual cloud level observed on Saturn," said Dr. Kevin H. Baines of Cassini's visual and infrared mapping spectrometer team at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "This gives us the deepest view yet into Saturn over a wide range of wavelengths, and reveals a mysterious set of dark clouds at the bottom of the eye."

Infrared images taken by the Keck I telescope in Mauna Kea, Hawaii, had previously shown Saturn's south pole to be warm. Cassini's composite infrared spectrometer has confirmed this with higher-resolution temperature maps of the area. The spectrometer observed a temperature increase of about 2 Kelvin (4 degrees Fahrenheit) at the pole. The instrument measured high temperatures in the upper troposphere and stratosphere, regions higher in the atmosphere than the clouds seen by the Cassini imaging instruments.

"The winds decrease with height, and the atmosphere is sinking, compressing and heating over the South Pole," said Dr. Richard Achterberg, a member of Cassini's composite infrared spectrometer team at NASA's Goddard Spaceflight Center, Greenbelt, Md.

Observations taken over the next few years, as the south pole season changes from summer to fall, will help scientists understand the role seasons play in driving the dramatic meteorology at the south pole of Saturn.

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 Cassini-Huygens mission for NASA’s Science Mission Directorate, Washington. The Cassini orbiter was designed, developed and assembled at JPL. The imaging team is based at the Space Science Institute, Boulder, Colo. The visual and infrared mapping spectrometer team is based at the University of Arizona. The composite infrared spectrometer team is based at Goddard.

For a movie, high-resolution images, infrared images and Saturn temperature maps, visit: http://saturn.jpl.nasa.gov, http://www.nasa.gov/cassini and http://ciclops.org.

-end-

News Release: 2006-139 Nov. 21, 2006

NASA'S Mars Global Surveyor May be at Mission's End

Pasadena, Calif. - NASA's Mars Global Surveyor has likely finished its operating career. The spacecraft has served the longest and been the most productive of any mission ever sent to the red planet.

"Mars Global Surveyor has surpassed all expectations," said Michael Meyer, NASA's lead scientist for Mars exploration at NASA Headquarters, Washington. "It has already been the most productive science mission to Mars, and it will yield more discoveries as the treasury of observations it has made continues to be analyzed for years to come." Its camera has returned more than 240,000 images to Earth.

The orbiter has not communicated with Earth since Nov. 2. Preliminary indications are that a solar panel became difficult to pivot, raising the possibility that the spacecraft may no longer be able to generate enough power to communicate. Engineers are also exploring other possible explanations for the radio silence.

"Realistically, we have run through the most likely possibilities for re-establishing communication, and we are facing the likelihood that the amazing flow of scientific observations from Mars Global Surveyor is over," said Fuk Li, Mars Exploration Program manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "We are not giving up hope, though."

Efforts to regain contact with the spacecraft and determine what has happened to it will continue. NASA's newest Mars spacecraft, the Mars Reconnaissance Orbiter, pointed its cameras toward Mars Global Surveyor on Monday. "We have looked for Mars Global Surveyor with the star tracker, the context camera and the high-resolution camera on Mars Reconnaissance Orbiter," said Doug McCuistion, Mars Exploration Program director at NASA Headquarters. "Preliminary analysis of the images did not show any definitive sightings of a spacecraft."

The next possibility for learning more about Mars Global Surveyor's status is a plan to send it a command to use a transmitter that could be heard by one of NASA's Mars Exploration Rovers later this week.

Mars Global Surveyor launched on Nov. 7, 1996, and began orbiting Mars on Sept. 11, 1997. It pioneered the use of aerobraking at Mars, using careful dips into the atmosphere for friction to shrink a long elliptical orbit into a nearly circular one. The mission then started its primary mapping phase in April 1999. The original plan was to examine the planet for one Mars year, nearly two Earth years. Based on the value of the science returned by the spacecraft, NASA extended its mission four times.

"It is an extraordinary machine that has done things the designers never envisioned despite a broken wing, a failed gyro and a worn-out reaction wheel. The builders and operating staff can be proud of their legacy of scientific discoveries and key support for subsequent missions," said Tom Thorpe, project manager for Mars Global Surveyor at JPL.

The spacecraft evaluated landing sites for the twin NASA rovers that landed in 2004 and sites for future landings of the Phoenix and Mars Science Laboratory missions. It monitored atmospheric conditions during aerobraking by newer orbiters. It served as a relay link for the rovers and provided mapping information about their surroundings.

"When we watched the launch 10 years ago, we wondered if we would make the specified mission length. We certainly

were not thinking of a 10-year operating life," said JPL retiree Glenn Cunningham, who managed the Global Surveyor project through development and launch.

A few of the mission's many important discoveries about Mars include:

-- The spacecraft's camera found gullies cut into many slopes that have few, if any, impact craters. This indicates the gullies are geologically young. Scientists interpret this as evidence of action by liquid water, essentially in modern times.

-- The mineral-mapping infrared spectrometer found concentrations of a mineral that often forms under wet conditions, fine-grained hematite. This discovery led to selection of a hematite-rich region as the landing site for NASA's Mars Exploration Rover Opportunity.

-- Laser altimeter measurements have produced an unprecedented global topographic map of Mars. The instrument revealed a multitude of highly eroded or buried craters too subtle for previous observation, and mapped canyons within the polar ice caps.

-- The magnetometer found localized remnant magnetic fields, indicating that Mars once had a global magnetic field like Earth's, shielding the surface from deadly cosmic rays.

-- The camera found a fan-shaped area of interweaving, curved ridges interpreted as evidence of an ancient river delta resulting from persistent flow of water over an extended period in the planet's ancient past.

-- A long life allowed Global Surveyor to track changes through repeated annual cycles. For three Martian summers in a row, deposits of carbon-dioxide ice near Mars' South Pole shrunk from the previous year's size, suggesting a climate change in progress.

JPL manages Mars Global Surveyor for the NASA Science Mission Directorate, Washington.

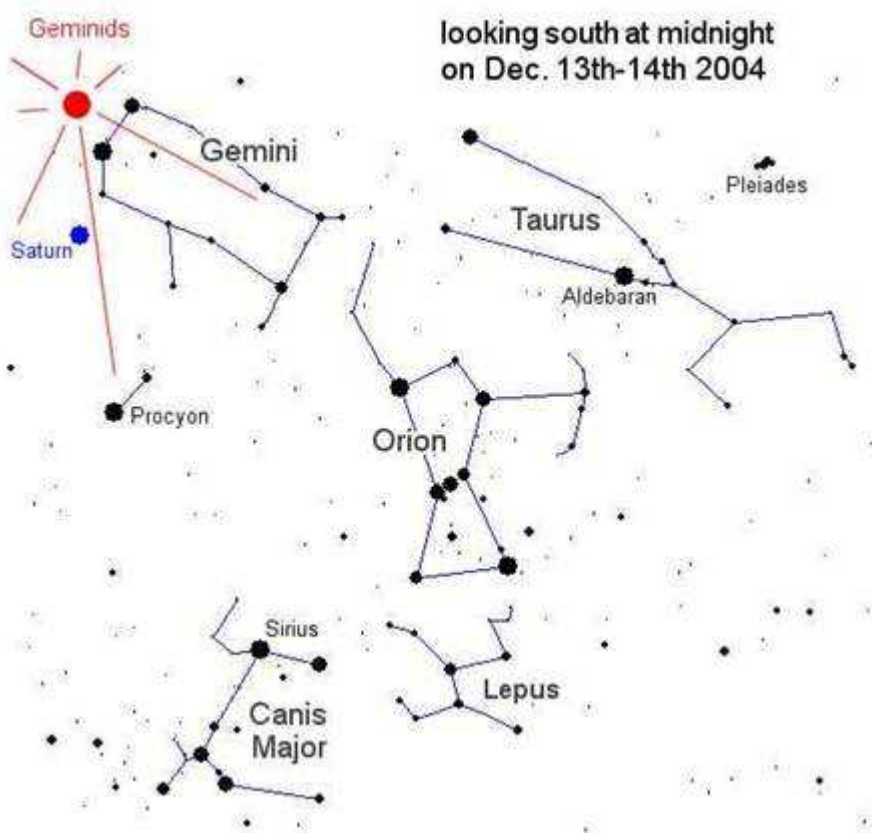
For more information on the mission, visit the Internet at:

http://www.nasa.gov/mission_pages/mgs/index.html

-end-

Mid Evening Observing Highlights for December

Orion and Gemini are rising in the east. Auriga and Taurus are higher in the eastern sky. Auriga contains the open clusters M36, M37, and M38. The open cluster M34 can be found in the northeastern sky between Andromeda and Perseus. The Double Cluster is high in the northern sky between Cassiopiea and Perseus. The open cluster M35 can be found in Gemini. The bright star Aldebaran can be found in Taurus. The Andromeda Galaxy is almost directly overhead. The Great Square is moving into the western sky. The Milky Way stretches from the east to west. Cygnus is setting in the western sky. Full moon is on December 5th and new moon is on December 20th. The Geminid meteor shower will peak on the evening of the 13th. The moon will be just past last quarter so it will rise late making the skies favorable for seeing the meteors. Look toward the eastern sky around the constellation Gemini to see them. The image below taken from http://science.nasa.gov/headlines/y2004/images/geminids2004/ shows the location of the radiant for the Geminid meteor shower. The image is for 2004 but is the same for 2006. Earlier in the evening the radiant will be in the eastern sky. This meteor shower is considered to be the second best of the year next to the Perseids in August.



NASA Space Place

Martian Devils

by Dr. Tony Phillips

Admit it. Whenever you see a new picture of Mars beamed back by Spirit or Opportunity, you scan the rocks to check for things peeking out of the shadows. A pair of quivering green antennas, perhaps, or a little furry creature crouched on five legs…? Looking for Martians is such a guilty pleasure.

Well, you can imagine the thrill in 2004 when scientists were checking some of those pictures and they *did* see something leap out. It skittered across the rocky floor of Gusev Crater and quickly disappeared. But it wasn't a Martian; Spirit had photographed a dust devil!

Dust devils are tornadoes of dust. On a planet like Mars which is literally covered with dust, and where it never rains, dust devils are an important form of weather. Some Martian dust devils grow almost as tall as Mt. Everest, and researchers suspect they're crackling with static electricity—a form of "Martian lightning."

NASA is keen to learn more. How strong are the winds? Do dust devils carry a charge? When does "devil season" begin—and end? Astronauts are going to want to know the answers before they set foot on the red planet.

The problem is, these dusty twisters can be devilishly difficult to catch. Most images of Martian dust devils have been taken by accident, while the rovers were looking for other things. This catch-as-catch-can approach limits what researchers can learn.

No more! The two rovers have just gotten a boost of artificial intelligence to help them recognize and photograph dust devils. It comes in the form of new software, uploaded in July and activated in September 2006.

"This software is based on techniques developed and tested as part of the NASA New Millennium Program's Space Technology 6 project. Testing was done in Earth orbit onboard the EO-1 (Earth Observing-1) satellite," says Steve Chien, supervisor of JPL's Artificial Intelligence Group. Scientists using EO-1 data were especially interested in dynamic events such as volcanoes erupting or sea ice breaking apart. So Chien and colleagues programmed the satellite to notice change. It worked beautifully: "We measured a 100-fold increase in science results for transient events."

Now that the techniques have been tested in Earth orbit, they are ready to help Spirit and Opportunity catch dust devils—or anything else that moves—on Mars.

"If we saw Martians, that would be great," laughs Chien. Even scientists have their guilty pleasures.

Find out more about the Space Technology 6 "Autonomous Sciencecraft" technology experiment at nmp.nasa.gov/st6/TECHNOLOGY/sciencecraft_tech.html, and the use of the technology on the Mars Rovers at nmp.nasa.gov/TECHNOLOGY/infusion.html. Kids can visit spaceplace.nasa.gov/en/kids/nmp_action.shtml and do a New Millennium Program-like test at home to see if a familiar material would work well in space

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

NASA Space Place

Martian Devils

by Dr. Tony Phillips

Admit it. Whenever you see a new picture of Mars beamed back by Spirit or Opportunity, you scan the rocks to check for things peeking out of the shadows. A pair of quivering green antennas, perhaps, or a little furry creature crouched on five legs…? Looking for Martians is such a guilty pleasure.

Well, you can imagine the thrill in 2004 when scientists were checking some of those pictures and they *did* see something leap out. It skittered across the rocky floor of Gusev Crater and quickly disappeared. But it wasn't a Martian; Spirit had photographed a dust devil!

Dust devils are tornadoes of dust. On a planet like Mars which is literally covered with dust, and where it never rains, dust devils are an important form of weather. Some Martian dust devils grow almost as tall as Mt. Everest, and researchers suspect they're crackling with static electricity—a form of "Martian lightning."

NASA is keen to learn more. How strong are the winds? Do dust devils carry a charge? When does "devil season" begin—and end? Astronauts are going to want to know the answers before they set foot on the red planet.

The problem is, these dusty twisters can be devilishly difficult to catch. Most images of Martian dust devils have been taken by accident, while the rovers were looking for other things. This catch-as-catch-can approach limits what researchers can learn.

No more! The two rovers have just gotten a boost of artificial intelligence to help them recognize and photograph dust devils. It comes in the form of new software, uploaded in July and activated in September 2006.

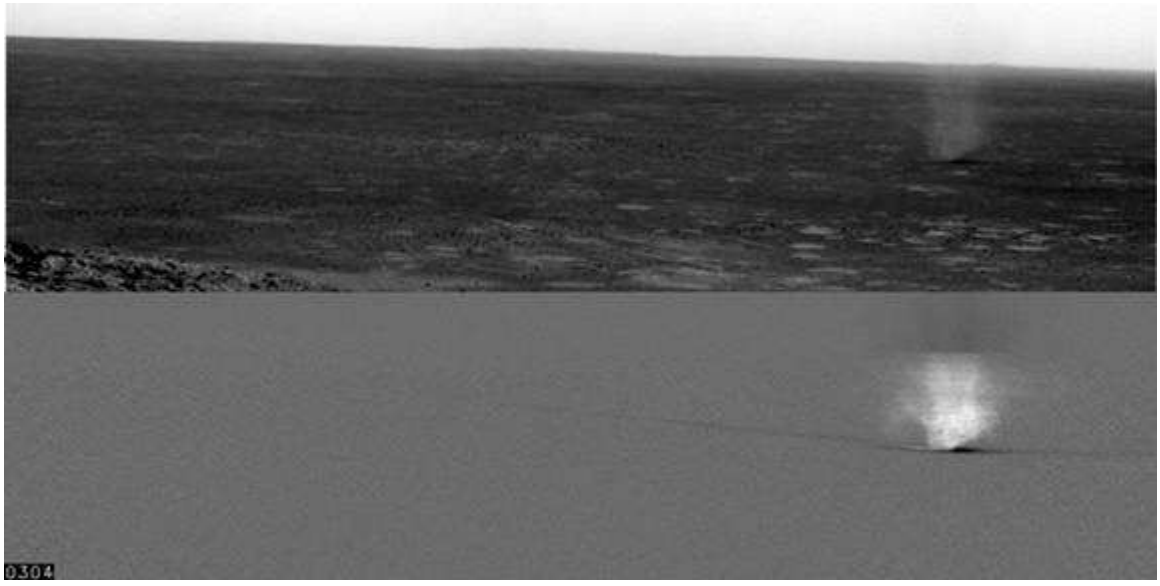
"This software is based on techniques developed and tested as part of the NASA New Millennium Program's Space Technology 6 project. Testing was done in Earth orbit onboard the EO-1 (Earth Observing-1) satellite," says Steve Chien, supervisor of JPL's Artificial Intelligence Group. Scientists using EO-1 data were especially interested in dynamic events such as volcanoes erupting or sea ice breaking apart. So Chien and colleagues programmed the satellite to notice change. It worked beautifully: "We measured a 100-fold increase in science results for transient events."

Now that the techniques have been tested in Earth orbit, they are ready to help Spirit and Opportunity catch dust devils—or anything else that moves—on Mars.

"If we saw Martians, that would be great," laughs Chien. Even scientists have their guilty pleasures.

Find out more about the Space Technology 6 "Autonomous Sciencecraft" technology experiment at nmp.nasa.gov/st6/TECHNOLOGY/sciencecraft_tech.html, and the use of the technology on the Mars Rovers at nmp.nasa.gov/TECHNOLOGY/infusion.html. Kids can visit spaceplace.nasa.gov/en/kids/nmp_action.shtml and do a New Millennium Program-like test at home to see if a familiar material would work well in space

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



Caption:
The top half of this image is part of a series of images of a passing dust devil on Mars caught by Spirit. In the bottom half, the image has been filtered to remove everything that did not change from one image to the other. Notice the faint track left by the dust devil. Credit NASA/JPL/Mark T. Lemmon, Univ. of Arizona Lunar and Planetary Laboratory.