Astronomy Club News

John Kocijanski, Editor

The observation session scheduled for September 3rd was held. Eleven people attended. The skies were clear but the seeing was a bit poor at times. Many deep sky objects were observed including the Veil Nebula, the Saturn Nebula, and the Little Dumbell Nebula. We also observed the faint galaxies NGC 7332 and NGC 7339 in Pegasus. Chris Haines' 17 inch dobsonian provided a great view of these two.

Our next observation session on September 10th was also held. Twelve people attended. After the moon set and the skies cleared out we had an opportunity to have a great observation session. We observed many deep sky objects and even saw a few meteors. Mars rose above the horizon later in the evening but it was still low in the sky so it gave a poor view. Later in the evening Rich Johnson observed an aurora after everyone else left. He sent this observation:

The sky lit up across the bowl of the big dipper and north. Some really nice green rays and bursts for about ten minutes, then it settled down to a steady green glow, all the way to Andes, close to an hour!

During the day on September 10th we had a solar observation session at Morgan Outdoors in Livingston Manor. We set up several solar telescopes on the sidewalk in front of the store to show the sun to anyone who happened to pass by. Jim McKeegan offered a telescope help session that day in the store. Many thanks to Lisa Lyons for allowing us to hold our session in front of her store. The image below shows our telescope lineup.

On September 17th Highpoint Scientific in Montague, NJ held a telescope show. Several vendors were present including Vixen, Televue, Celestron, and Universal Astronomics. Many telescopes were on display inside their store. Solar observing was done outside however the sky condition was cloudy most of the time. Highpoint was kind enough to allow our club schedules to be displayed for the public to pick up. The image below shows the inside of the store and a Meade 12 inch schmidt cassegrain telescope mounted using a Universal Astronomics Unistar head.

The October club observation sessions are on the 1st and 8th. On October 2nd the club will have a table at the Farm Market in Bethel at the Woodstock concert site. The market is open from 11:00 to 3:00. We will be promoting the club and doing a public solar observation session.

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

Each month the photo section of our newsletter will highlight the telescopes and equipment of club members. If you have a photo of your scope or equipment and a brief description of it that you would like to contribute please send it to John at kocis@verizon.net.

The club has selection of astronomy books, a Macintosh computer with astronomy software, 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: 2005-151 September 16, 2005

Cassini Radar Images Show Dramatic Shoreline on Titan

Images returned during Cassini's recent flyby of Titan show captivating evidence of what appears to be a large shoreline cutting across the smoggy moon's southern hemisphere. Hints that this area was once wet, or currently has liquid present, are evident.

"We've been looking for evidence of oceans or seas on Titan for some time. This radar data is among the most telling evidence so far for a shoreline," said Steve Wall, radar deputy team leader from NASA's Jet Propulsion Laboratory, Pasadena, Calif.

The new radar images can be seen at: http://www.nasa.gov/cassini and http://saturn.jpl.nasa.gov .

The images show what looks like a shoreline dividing a distinct bright and dark region roughly 1,700 kilometers long by 170 kilometers wide (1,060 by 106 miles). Directly to the right of a bright and possibly rough area is one that is very dark and smooth.

"This is the area where liquid or a wet surface has most likely been present, now or in the recent past, said Wall. "Titan probably has episodic periods of rainfall or massive seepages of liquid from the ground."

The brightness patterns in the dark area indicate that it may once have been flooded with liquid that may now have partially receded. Bay-like features also lead scientists to speculate that the bright-dark boundary is most likely a shoreline.

"We also see a network of channels that run across the bright terrain, indicating that fluids, probably liquid hydrocarbons, have flowed across this region," said Dr. Ellen Stofan, Cassini associate radar team member from Proxemy Research, Laytonsville, Md.

Taken together with the two other radar passes in October 2004 and February 2005, these very high resolution images have identified at least two distinct types of drainage and channel formation on Titan. Some channels in images from this pass are long and deep, with angular patterns and few tributaries, suggesting that fluids flow over great distances. By contrast, others show channels that form a denser network that might indicate rainfall.

Dr. Larry Soderblom with the U.S. Geological Survey in Flagstaff, Ariz., said, "It looks as though fluid flowed in these channels, cutting deeply into the icy crust of Titan. Some of the channels extend over 100 kilometers (60 miles). Some of them may have been fed by springs, while others are more complicated networks that were likely filled by rainfall."

Titan has an environment somewhat similar to that of Earth before biological activity forever altered the composition of Earth's atmosphere. The major difference on Titan, however, is the absence of liquid water, and Titan's very low temperature. With a thick, nitrogen-rich atmosphere, Titan was until recently presumed to hold

large seas or oceans of liquid methane. Cassini has been in orbit around Saturn for a year and has found no evidence for these large seas.

Cassini encountered an anomaly with one of two solid-state recorders during the Sept. 7 close flyby, resulting in some data not being recorded. Half of the data from the flyby was received, much to the delight of anxious scientists. The spacecraft team is troubleshooting the cause, and early indications point to a software problem that would be correctable with no long-term impacts.

This was Cassini's eighth out of 45 Titan flybys planned in the nominal four-year tour. The next radar pass will be Oct. 26 when the team will focus on the Huygens probe landing site close to the equator.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. JPL, 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 radar instrument team is based at JPL, working with team members from the United States and several European countries.

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News Release 2005-144 Sept. 7, 2005

NASA's Spitzer and Deep Impact Build Recipe for Comet Soup

When Deep Impact smashed into comet Tempel 1 on July 4, 2005, it released the ingredients of our solar system's primordial "soup." Now, astronomers using data from NASA's Spitzer Space Telescope and Deep Impact have analyzed that soup and begun to come up with a recipe for what makes planets, comets and other bodies in our solar system.

"The Deep Impact experiment worked," said Dr. Carey Lisse of Johns Hopkins University's Applied Physics Laboratory, Laurel, Md. "We are assembling a list of comet ingredients that will be used by other scientists for years to come." Lisse is the team leader for Spitzer's observations of Tempel 1. He presented his findings this week at the 37th annual meeting of the Division of Planetary Sciences in Cambridge, England.

Spitzer watched the Deep Impact encounter from its lofty perch in space. It trained its infrared spectrograph on comet Tempel 1, observing closely the cloud of material that was ejected when Deep Impact's probe plunged below the comet's surface. Astronomers are still studying the Spitzer data, but so far they have spotted the signatures of a handful of ingredients, essentially the meat of comet soup.

These solid ingredients include many standard comet components, such as silicates, or sand. And like any good recipe, there are also surprise ingredients, such as clay and chemicals in seashells called carbonates. These compounds were unexpected because they are thought to require liquid water to form.

"How did clay and carbonates form in frozen comets?" asked Lisse. "We don't know, but their presence may imply that the primordial solar system was thoroughly mixed together, allowing material formed near the Sun where water is liquid, and frozen material from out by Uranus and Neptune, to be included in the same body."

Also found were chemicals never seen before in comets, such as iron-bearing compounds and aromatic hydrocarbons, found in barbecue pits and automobile exhaust on Earth.

The silicates spotted by Spitzer are crystallized grains even smaller than sand, like crushed gems. One of these silicates is a mineral called olivine, found on the glimmering shores of Hawaii's Green Sands Beach.

Planets, comets and asteroids were all born out of a thick soup of chemicals that surrounded our young Sun about 4.5 billion years ago. Because comets formed in the outer, chilly regions of our solar system, some of this early planetary material is still frozen inside them.

Having this new grocery list of comet ingredients means theoreticians can begin testing their models of planet formation. By plugging the chemicals into their formulas, they can assess what kinds of planets come out the other end.

"Now, we can stop guessing at what's inside comets," said Dr. Mike A'Hearn, principal investigator for the Deep Impact mission, University of Maryland, College Park. "This information is invaluable for piecing together how our own planets as well as other distant worlds may have formed."

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 Caltech. The University of Maryland, College Park, conducted the overall mission management for Deep Impact, and JPL handled project management for the mission for NASA's Science Mission Directorate.

For more graphics and more information about Spitzer, visit http://www.spitzer.caltech.edu/Media/index.shtml .

For more information about Deep Impact, visit http://deepimpact.jpl.nasa.gov or http://www.nasa.gov/deepimpact .

For more information about NASA, visit http://www.nasa.gov/home/ .

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News Release: 2005-152 September 20, 2005

Orbiter's Long Life Helps Scientists Track Changes on Mars

New gullies that did not exist in mid-2002 have appeared on a Martian sand dune.

That's just one of the surprising discoveries that have resulted from the extended life of NASA's Mars Global Surveyor, which this month began its ninth year in orbit around Mars. Boulders tumbling down a Martian slope left tracks that weren't there two years ago. New impact craters formed since the 1970s suggest changes to age-estimating models. And for three Mars summers in a row, deposits of frozen carbon dioxide near Mars' south pole have shrunk from the previous year's size, suggesting a climate change in progress.

"Our prime mission ended in early 2001, but many of the most important findings have come since then, and even bigger ones might lie ahead," said Tom Thorpe, project manager for Mars Global Surveyor at NASA's Jet Propulsion Laboratory, Pasadena, Calif. The orbiter is healthy and may be able to continue studying Mars for five to 10 more years, he said.

Mars years are nearly twice as long as Earth years. The orbiter's longevity has enabled monitoring of year-to-year patterns on Mars, such as seasonal dust storms and changes in the polar caps. "Mars is an active planet, and over a range of timescales changes occur, even in the surface," said Dr. Michael Malin of Malin Space Science Systems, San Diego, principal investigator for the Mars Orbiter Camera on Mars Global Surveyor.

"To see new gullies and other changes in Mars surface features on a time span of a few years presents us with a more active, dynamic planet than many suspected before Mars Global Surveyor got there," said Michael Meyer, Mars Exploration Program chief scientist, NASA Headquarters, Washington.

Two gullies appear in an April 2005 image of a sand-dune slope where they did not exist in July 2002. The Mars Orbiter Camera team has found many sites on Mars with fresh-looking gullies, and checked back at more than 100 gullied sites for possible changes between imaging dates, but this is the first such find. Some gullies, on slopes of large sand dunes, might have formed when frozen carbon dioxide, trapped by windblown sand during winter, vaporized rapidly in spring, releasing gas that made the sand flow as a gully-carving fluid.

At another site, more than a dozen boulders left tracks when they rolled down a hill sometime between the taking of images in November 2003 and December 2004. It is possible that they were set in motion by strong wind or by a "marsquake," Malin said.

Some changes are slower than expected. Studies suggest new impact craters might appear at only about one-fifth the pace assumed previously, Malin said. That pace is important because crater counts are used to estimate the ages of Mars surfaces.

The camera has recorded seasonal patterns of clouds and dust within the atmosphere over the entire planet. In addition, other instruments on Mars Global Surveyor have provided information about atmospheric changes and year-to-year patterns on Mars as the mission has persisted. Daily mapping of dust abundance in Mars' atmosphere by the Thermal Emission Spectrometer has shown dust over large areas during three Mars southern hemisphere summers in a row. However, the extent and duration of dust storms varied from year to year.

Mars Global Surveyor was launched Nov. 7, 1996; entered orbit around Mars
Sept. 12, 1997; and returned the first Mars data from its science instruments Sept. 15, 1997. Beyond its own investigations, the orbiter provides support for other Mars missions, such as landing-site evaluations, atmospheric monitoring, communication relay and imaging of hardware on the surface. JPL, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington. JPL's industrial partner is Lockheed Martin Space Systems, Denver, which built and operates the spacecraft.

For newly released images on the Internet, visit:
http://www.nasa.gov/vision/universe/solarsystem/mgs-092005-images.html
and http://www.msss.com/mars_images/moc/2005/09/20/ .

For more information about NASA and agency programs on the Internet, visit:
http://www.nasa.gov/home

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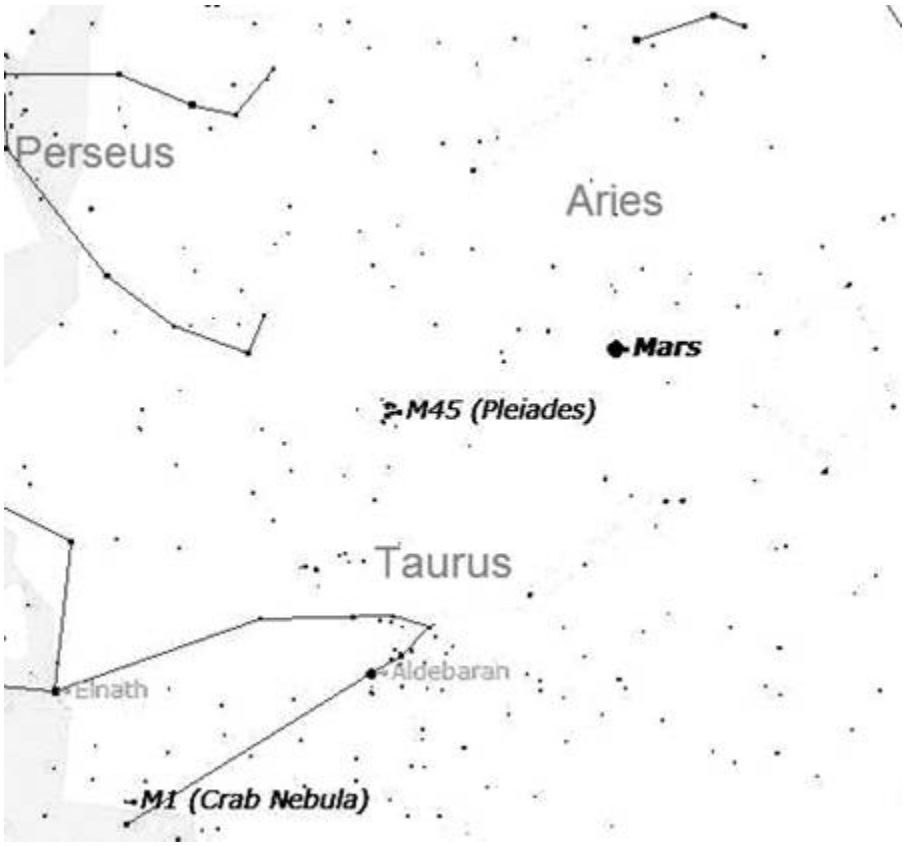
Midevening Observing Highlights for October

The Milky Way stretches across the sky from southwest to northeast. Cygnus can be found almost directly overhead. The Great Square of Pegasus is high in the east. To the northeast of the Great Square the constellation of Andromeda can be seen and just above its center is M31, the Andromeda Galaxy. The Double Cluster (NGC 869 and NGC 884) in Perseus can be seen rising in the northeast below Cassiopiea. Sagittarius is setting in the southwest. The bright stars Capella and Aldebaran are rising in the east. The Big Dipper is low on the northern horizon. Mars is very bright and large. It rising in the eastern sky and on October 29th it is closest to the Earth. Full moon is on October 17th and new moon is on October 3rd. The image below shows the position of Mars in the eastern sky.



Observations and Photographs

The image below shows the Harvest Moon taken on September 18th. The Harvest Moon is the closest full moon to the Fall Equinox. The image was taken afocally by John Kocijanski using an Olympus digital camera through a Meade 26mm eyepiece on an Orion XT4.5 reflecting telescope.

NASA Space Place

Where No Spacecraft Has Gone Before

by Dr. Tony Phillips

In 1977, Voyager 1 left our planet. Its mission: to visit Jupiter and Saturn and to study their moons. The flybys were an enormous success. Voyager 1 discovered active volcanoes on Io, found evidence for submerged oceans on Europa, and photographed dark rings around Jupiter itself. Later, the spacecraft buzzed Saturn's moon Titan—alerting astronomers that it was a very strange place indeed! —and flew behind Saturn's rings, seeing what was hidden from Earth.

Beyond Saturn, Neptune and Uranus beckoned, but Voyager 1's planet-tour ended there. Saturn's gravity seized Voyager 1 and slingshot it into deep space. Voyager 1 was heading for the stars—just as NASA had planned.

Now, in 2005, the spacecraft is nine billion miles (96 astronomical units) from the Sun, and it has entered a strange region of space no ship has ever visited before.

"We call this region 'the heliosheath.' It's where the solar wind piles up against the interstellar medium at the outer edge of our solar system," says Ed Stone, project scientist for the Voyager mission at the Jet Propulsion Laboratory.

Out in the Milky Way, where Voyager 1 is trying to go, the "empty space" between stars is not really empty. It's filled with clouds of gas and dust. The wind from the Sun blows a gigantic bubble in this cloudy "interstellar medium." All nine planets from Mercury to Pluto fit comfortably inside. The heliosheath is, essentially, the bubble's skin.

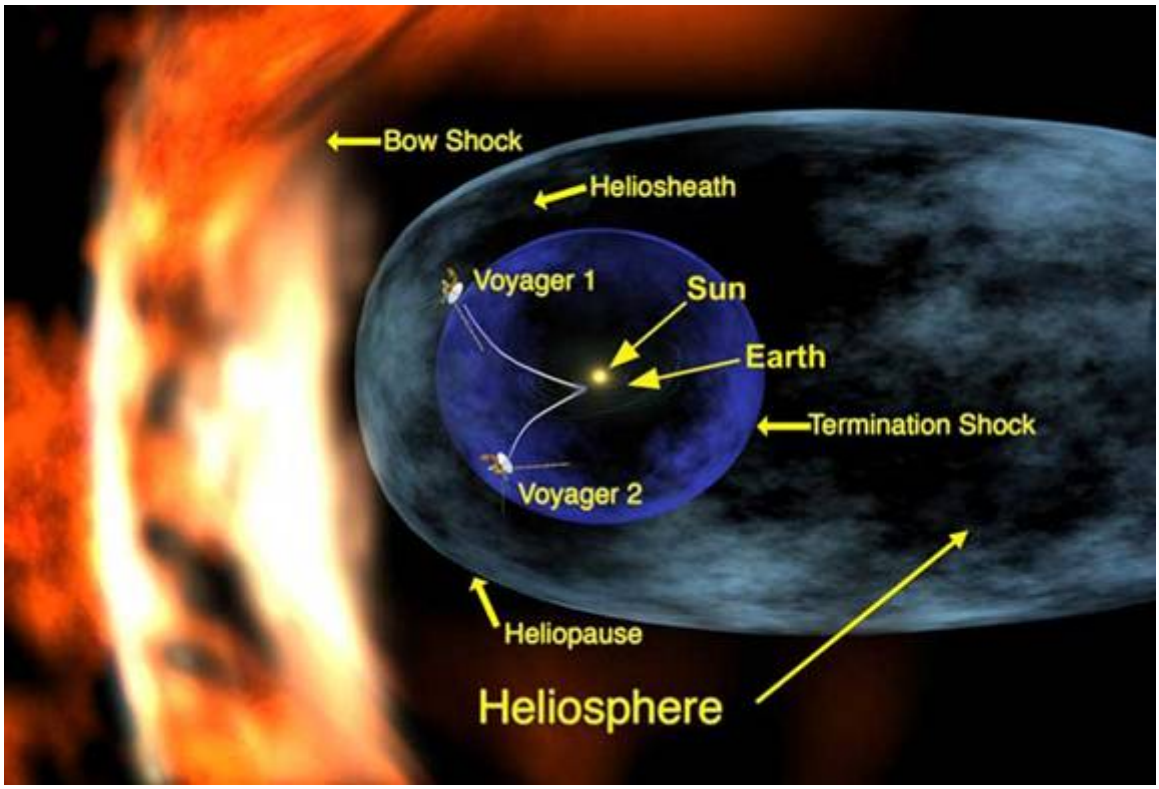
"The heliosheath is different from any other place we've been," says Stone. Near the Sun, the solar wind moves at a million miles per hour. At the heliosheath, the solar wind slows eventually to a dead stop. The slowing wind becomes denser, more turbulent, and its magnetic field—a remnant of the sun's own magnetism--grows stronger.

So far from Earth, this turbulent magnetic gas is curiously important to human life. "The heliosheath is a shield against galactic cosmic rays," explains Stone. Subatomic particles blasted in our direction by distant supernovas and black holes are deflected by the heliosheath, protecting the inner solar system from much deadly radiation.

Voyager 1 is exploring this shield for the first time. "We'll remain inside the heliosheath for 8 to 10 years," predicts Stone, "then we'll break through, finally reaching interstellar space."

What's out there? Stay tuned…

For more about the twin Voyager spacecraft, visit voyager.jpl.nasa.gov. Kids can learn about Voyager 1 and 2 and their grand tour of the outer planets at spaceplace.nasa.gov/en/kids/vgr_fact3.shtml .



Caption: *Voyager 1, after 28 years of travel, has reached the heliosheath of our solar system.*