



Astronomy Club News

October, 2006

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On September 17th the club attended the Harvest Festival at Bethel Woods near White Lake, NY. We handed out information about the club as well a NASA outreach materials. Many people came by our table and viewed the sun through two telescopes that were set up. The image below shows some of the people who stopped by to have a look.



The observation session scheduled for September 16th was held. Seven people attended. The skies were very clear. Many deep sky objects were observed including the Veil Nebula and Andromeda Galaxy. We also observed a number of meteors throughout the evening.

The observation session scheduled for September 23rd at the Big Twig recording studio was canceled due to poor weather. A makeup date has not been set yet.

We would also like to plan some indoor “dinner and a movie” meetings at Morgan Outdoors in Livingston Manor. In the past the DVDs that were shown were rented from Netflix.

After showing the better programs available the selection from that source has been exhausted for the most part. A new source is needed. If anyone knows of an alternate source of DVDs please contact John at kocis@verizon.net. Another possibility is to show VHS tapes but a large screen for this would be needed.

The October club observation sessions are on the 14th and 21st.

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 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.

Image Advisory: 2006-111

September 19, 2006

NASA Rover Opportunity Takes First Peek Into Victoria Crater

On Monday, NASA's Mars rover Opportunity got to within about 160 feet of the rim of the half-mile-wide Victoria Crater, the rover's destination since late 2004.

The new position gave Opportunity a glimpse of the crater's opposite wall. That view from the navigation camera on the rover is available online at http://www.nasa.gov/mission_pages/mer/images/20060919.html.

"Opportunity has been heading toward Victoria for more than 20 months, with no guarantee it would ever get there, so we are elated to see this view," said Justin Maki of NASA's Jet Propulsion Laboratory, Pasadena, Calif., an imaging scientist on the rover team. "However, we still have another two or three short drives before Opportunity is really right at the rim, looking down into the crater."

Once Opportunity reaches the rim, the rover's panoramic camera will begin the task of creating a high-definition color mosaic. That mosaic of images will provide scientists not only with a beautiful view of the crater, but will also provide geologic details of the crater walls.

The width of Victoria crater is the equivalent of eight football fields placed end to end. That makes it about five times wider than "Endurance Crater," which Opportunity spent six months examining in 2004, and about 40 times wider than "Eagle Crater," where Opportunity first landed.

The great lure of Victoria is the expectation that a thick stack of geological layers will be exposed in the crater walls, potentially several times the thickness that was previously studied at

Endurance and, therefore, potentially preserving several times the historical record. Opportunity and its twin, Spirit, are robotic geologists with instruments for examining rocks to learn about the ancient environmental conditions that existed at the times the rocks were formed. Opportunity has already found exposed rock layers that were formed in flowing surface water and other layers formed as windblown sand. Analyzing the layers at Victoria could extend the story further back in time.

JPL, a division of the California Institute of Technology, manages the Mars Exploration Rover mission for the NASA Science Mission Directorate, Washington. For additional images and information about the mission, visit www.nasa.gov/mission_pages/mer.

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News Release: 2006-110

September 19, 2006

Scientists Discover New Ring and Other Features at Saturn

Saturn sports a new ring in an image taken by NASA's Cassini spacecraft on Sunday, Sept. 17, during a one-of-a-kind observation.

Other spectacular sights captured by Cassini's cameras include wispy fingers of icy material stretching out tens of thousands of kilometers from the active moon, Enceladus, and a cameo color appearance by planet Earth.

The images were obtained during the longest solar occultation of Cassini's four-year mission. During a solar occultation, the sun passes directly behind Saturn, and Cassini lies in the shadow of Saturn while the rings are brilliantly backlit. Usually, an occultation lasts only about an hour, but this time it was a 12-hour marathon.

Sunday's occultation allowed Cassini to map the presence of microscopic particles that are not normally visible across the ring system. As a result, Cassini saw the entire inner Saturnian system in a new light.

The new ring is a tenuous feature, visible outside the brighter main rings of Saturn and inside the G and E rings, and coincides with the orbits of Saturn's moons Janus and Epimetheus. Scientists expected that meteoroid impacts on Janus and Epimetheus might kick particles off the moons' surfaces and inject them into Saturn orbit, but they were surprised that a well-defined ring structure exists at this location.

Saturn's extensive, diffuse E ring, the outermost ring, had previously been imaged one small section at a time. The 12-hour marathon enabled scientists to see the entire structure in one view. The moon Enceladus is seen sweeping through the E ring, extending wispy, fingerlike projections into the ring. These very likely consist of tiny ice particles being ejected from Enceladus' south polar geysers, and entering the E-ring.

"Both the new ring and the unexpected structures in the E ring should provide us with important insights into how moons can both release small particles and sculpt their local environments," said Matt Hedman, a research associate working with team member Joseph Burns, an expert in diffuse rings, at Cornell University in Ithaca, N.Y.

In the latest observations, scientists once again see the bright ghost-like spokes -- transient, dusty, radial structures -- streaking across the middle of Saturn's main rings.

Capping off the new batch of observations, Cassini cast its powerful eyes in our direction and captured Earth, a pale blue orb, and a faint suggestion of our moon. Not since NASA's Voyager 1 spacecraft saw Earth as a pale blue dot from beyond the orbit of Neptune has Earth been imaged in color from the outer solar system.

"Nothing has greater power to alter our perspective of ourselves and our place in the cosmos than these images of Earth we collect from faraway places like Saturn," said Carolyn Porco, Cassini imaging team leader at the Space Science Institute, Boulder, Colo. Porco was one of the Voyager imaging scientists involved in taking the Voyager `Pale Blue Dot' image. "In the end, the ever-widening view of our own little planet against the immensity of space is perhaps the greatest legacy of all our interplanetary travels."

In the coming weeks, several science teams will analyze data collected by Cassini's other instruments during this rare occultation event. The data will help scientists better understand the relationship between the rings and moons, and will give mission planners a clearer picture of ring hazards to avoid during future ring crossings.

Images of the new ring, the E-ring, Enceladus and Earth are available at:
<http://www.nasa.gov/cassini> , <http://saturn.jpl.nasa.gov> and <http://ciclops.org> .

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 and its two onboard cameras were designed, developed and assembled at JPL. The imaging team is based at the Space Science Institute, Boulder, Colo.

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News Release: 2006-109

September 19, 2006

Ground-Piercing Radar on NASA Mars Orbiter Ready for Work

NASA's Mars Reconnaissance Orbiter has extended the long-armed antenna of its radar, preparing the instrument to begin probing for underground layers of Mars.

The orbiter's Shallow Subsurface Radar, provided by the Italian Space Agency, will search to depths of about one kilometer (six-tenths of a mile) to find and map layers of ice, rock and, if present, liquid water.

The radar's antenna had remained safely folded and tucked away throughout the flight to Mars from Aug. 12, 2005, to March 10, 2006, and while the orbiter used the friction of dipping into the top of Mars' atmosphere 426 times in the past six months to shrink the size of its orbit. Latches on the restraints were popped open on Sept. 16, and the spring-loaded twin arms of the antenna unfolded themselves. Subsequent information from the spacecraft indicates that each arm properly extended to its 5 meter (16.4 feet) length.

"The deployment of the antenna has succeeded. It went exactly as planned," said Dr. Enrico Flamini, the Italian Space Agency's program manager for the Shallow Subsurface Radar. "Now the excitement builds about what the radar will find hiding beneath the surface of Mars."

A radar-team engineer at NASA's Jet Propulsion Laboratory, Pasadena, Calif., Ali Safaeinili, said, "Motion sensors on Mars Reconnaissance Orbiter gave us good evidence that the antenna had deployed successfully. The amount of antenna vibrations as the arms unfolded was within the range anticipated."

The radar received its first radio echo from the Martian surface during a test on Sept. 18, providing a preliminary indication that the entire instrument is working properly. Researchers will use the instrument for more test observations at the end of this month. Communication with all spacecraft at Mars will be intermittent during most of October while that planet is behind the sun from Earth's perspective. The two-year-long main science phase of the Mars Reconnaissance Orbiter mission will begin in November.

"We will use the Shallow Radar to map buried channels, to study the internal structure of ice caps and to see boundaries between layers of different materials," said Dr. Roberto Seu of the University of Rome La Sapienza, leader of the instrument's science team. "The data will provide our first detailed look just under the Martian surface, where ices might reside that would be accessible for future explorers."

The radar instrument on the Mars Reconnaissance Orbiter will complement a similar instrument that went into use last year on the European Space Agency's Mars Express orbiter, the Mars Advanced Radar for Subsurface and Ionospheric Sounding. The two instruments use different radar frequencies. The one on Mars Reconnaissance Orbiter can discriminate between thinner layers, but cannot penetrate as deep underground, compared with the one on Mars Express. Both result from Italian and American partnership in using radar for planetary probes.

Alcatel Alenia Spazio-Italia, in Rome, is the Italian Space Agency's prime contractor for the instrument. Astro Aerospace, of Carpinteria, Calif., a business unit of Los Angeles-based Northrop Grumman Corp., developed the antenna as a subcontractor to Alcatel Alenia.

Further information about the Shallow Subsurface Radar is online at www.sharad.org. For more detailed information about the Mars Reconnaissance Orbiter, see www.nasa.gov/mission_pages/MRO/main. The mission is managed by JPL, a division of the California Institute of Technology, Pasadena, for the NASA Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, is the prime contractor and built the orbiter.

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NEWS RELEASE: 2006-115

September 25, 2006

NASA Mars Spacecraft Gear Up for Extra Work

NASA's Mars robotic missions are performing so well, they are being prepared for additional overtime work.

The team operating the twin Mars Exploration Rovers, Spirit and Opportunity, since January 2004, won approval for an additional year of exploration. NASA funded the extensions on recommendations from an outside panel of scientists. NASA also is adding two more years of operations for Mars Global Surveyor, which has been orbiting Mars since 1997, and the Mars Odyssey orbiter, at the red planet since 2001.

These mission extensions will begin Oct. 1, 2006. The spacecraft beginning extended missions have already completed a successful prime mission plus years of additional service. The extensions occur when NASA's newest Mars spacecraft, named the Mars Reconnaissance Orbiter, is about to begin its main science phase.

"Each of these missions increases the value of the others and of the Mars Reconnaissance Orbiter," said Doug McCuiston, director of NASA's Mars Exploration Program, NASA Headquarters, Washington. "By extending these missions, we gain very cost-effective additional benefits from the investments in developing them and getting them to Mars."

Each orbiter has a different set of instruments, and the spacecraft complement each other in helping scientists understand Mars. Also, observations by the rovers on the ground validate interpretation of information from the orbiters. Observations by the orbiters allow extrapolation from what the rovers find in small areas. The orbiters support current and future surface missions with landing-site assessments and communication relays.

Both rovers are still healthy, more than 31 months into what was originally planned as a three-month exploration of their landing areas. Provided they remain operable, their fourth mission extension will take them into Martian spring and summer, increasing their solar-energy supply and daily capabilities. Spirit has been studying its surroundings from a stationary, sun-facing tilt for several months. "As we get into the Martian spring, Spirit will resume exploring the inner basin of the 'Columbia Hills,'" said Dr. Bruce Banerdt, rover project scientist at NASA's Jet Propulsion Laboratory, Pasadena, Calif. Opportunity will spend the extension at "Victoria Crater."

Each Martian year lasts nearly two Earth years. The longevity of Mars Global Surveyor and Mars Odyssey has allowed researchers to watch how Mars changes not just from season to season, but from year to year. Mars Global Surveyor has observed shrinking of the south polar carbon-dioxide ice cap from one summer to the next. "This extension will take us through our fifth annual cycle of Martian summers and winters," said Thomas Thorpe of JPL, project manager for Mars Global Surveyor.

"With the additional years of observations, we are able to monitor the Martian climate, not just the weather. There is a hypothesis that Mars' climate is changing, perhaps rapidly. The combination of instruments from different orbiters strengthens our ability to study that possibility. With Odyssey, for example, we can monitor the mass of carbon-dioxide frost in winter to help understand the changes that Global Surveyor is seeing in the summers," said JPL's Dr. Jeffrey Plaut, project scientist for Mars Odyssey.

The Odyssey flight team at JPL and at Lockheed Martin Space Systems, Denver, plans to teach the spacecraft some new tricks during the mission extension. New software will enable the spacecraft to make choices about which images are high priority. Also, the team will begin pointing Odyssey slightly off the straight-down view it has flown so far. This will enable imaging of polar areas it never flies directly over. Odyssey also will continue serving as the primary communications relay for the rovers Spirit and Opportunity.

NASA also has extended the U.S. participation in the European Space Agency's Mars Express mission. That orbiter reached Mars in 2003 and is in an extended mission.

JPL, a division of the California Institute of Technology, Pasadena, manages the Mars Global Surveyor, Mars Odyssey and Mars Exploration Rover projects for the NASA Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, is the prime contractor for the Global Surveyor and Odyssey projects and built those spacecraft.

For additional information about NASA Mars missions, visit:
http://www.nasa.gov/mission_pages/mars/main .

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Mid evening 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 Cassiopeia. 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. Full moon is on October 7th and new moon is on October 22nd. The Orionid meteor shower peaks in the 20th. After midnight on October 10th the moon will occult the Pleiades. The image below shows the moon and Pleiades around 1:00AM on October 10th.



Staggering Distance

By Dr. Tony Phillips

Tonight, when the sun sets and the twilight fades to black, go outside and look southwest. There's mighty Jupiter, gleaming brightly. It looks so nearby, yet Jupiter is 830 million km away. Light from the sun takes 43 minutes to reach the giant planet, and for Earth's fastest spaceship, New Horizons, it's a trip of 13 months.

That's nothing.

Not far to the left of Jupiter is Pluto. Oh, you won't be able to see it. Tiny Pluto is almost 5 billion km away. Sunlight takes more than 4 hours to get there, and New Horizons 9 years. From Pluto, the sun is merely the brightest star in a cold, jet-black sky.

That's nothing.

A smidgen to the right of Pluto, among the stars of the constellation Ophiuchus, is Voyager 1. Launched from Florida 29 years ago, the spacecraft is a staggering 15 billion km away. It has traveled beyond all the known planets, beyond the warmth of the sun, almost beyond the edge of the solar system itself.

Now that's something.

“On August 15, 2006, Voyager 1 reached the 100 AU mark—in other words, it is 100 times farther from the Sun than Earth,” says Ed Stone, Voyager project scientist and the former director of NASA's Jet Propulsion Laboratory. “This is an important milestone in our exploration of the Solar System. No other spacecraft has gone so far.”

At 100 AU (astronomical units), Voyager 1 is in a strange realm called “the heliosheath.”

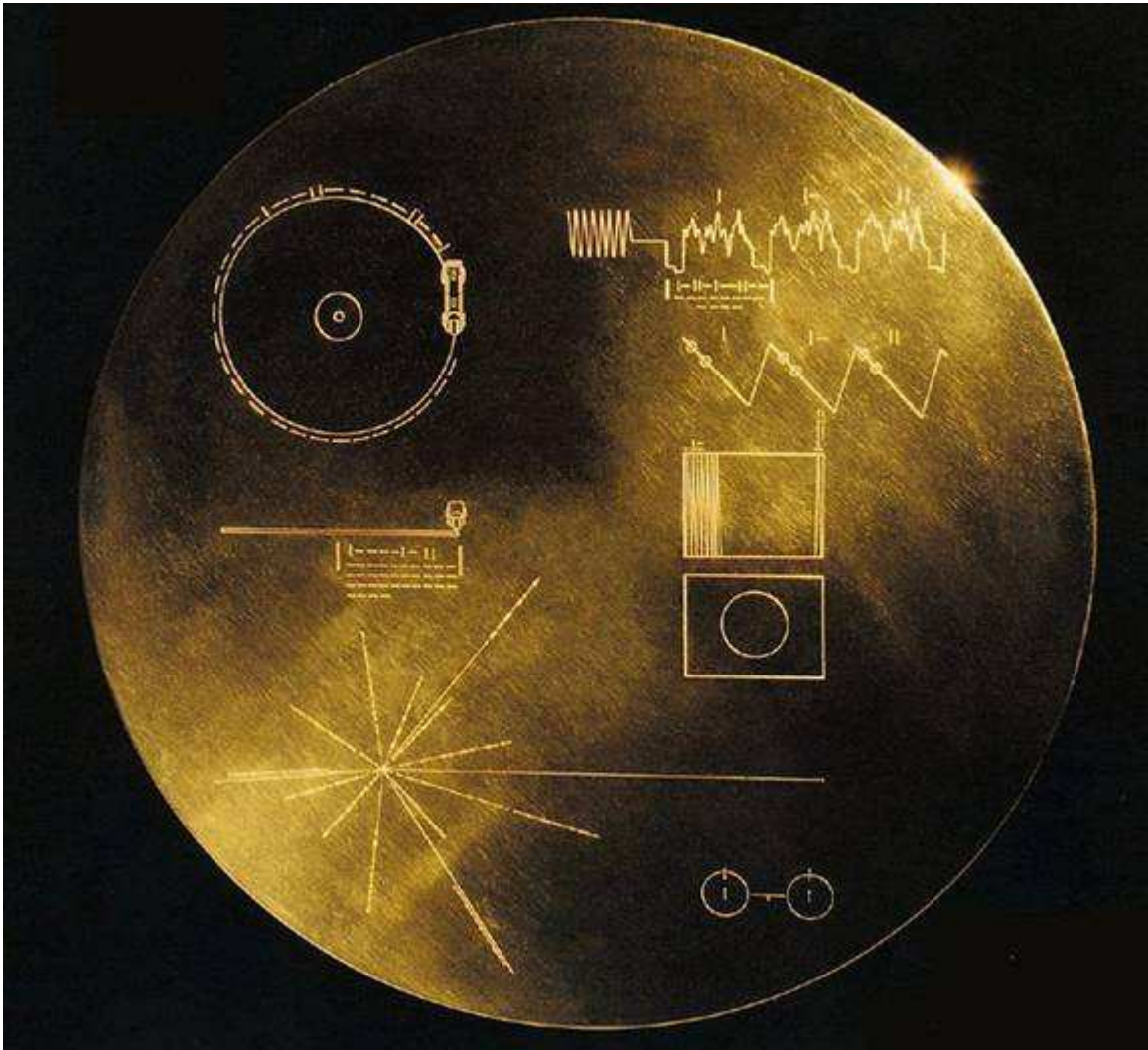
As Stone explains, our entire solar system—planets and all—sits inside a giant bubble of gas called the heliosphere. The sun is responsible; it blows the bubble by means of the solar wind. Voyager 1 has traveled all the way from the bubble's heart to its outer edge, a gassy membrane dividing the solar system from interstellar space. This “membrane” is the heliosheath.

Before Voyager 1 reached its present location, researchers had calculated what the heliosheath might be like. “Many of our predictions were wrong,” says Stone. In situ, Voyager 1 has encountered unexpected magnetic anomalies and a surprising increase in low-energy cosmic rays, among other things. It's all very strange—“and we're not even out of the Solar System yet.”

To report new developments, Voyager radios Earth almost every day. At the speed of light, the messages take 14 hours to arrive. Says Stone, “it's worth the wait.”

Keep up with the Voyager mission at voyager.jpl.nasa.gov. To learn the language of Voyager's messages, kids (of all ages) can check out spaceplace.nasa.gov/en/kids/vgr_fact1.shtml.

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



Caption:

In case it is ever found by intelligent beings elsewhere in the galaxy, Voyager carries a recording of images and sounds of Earth and its inhabitants. The diagrams on the cover of the recording symbolize Earth's location in the galaxy and how to play the record.