The Morris Museum Astronomical Society

The

Heavenly Herald

VOLUME 38, ISSUE 3 FALL 2010

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THE MORRIS MUSEUM ASTRONOMICAL SOCIETY

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The *Heavenly Herald* is produced quarterly for the membership of the Morris Museum Astronomical Society

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Member of

THE MORRIS MUSEUM

MESSAGE FROM THE PRESIDENT

Ron Russo, President

On August 21, 2010 we had our annual summer picnic at Jenny Jump which was very well attended . It started at 3:00PM and went thru to 7:00PM. It was one of the best attended picnic's in recent memories. We had 12 members and some prospective members of the MMAS. Hot dogs hamburgers, sodas and other munchies were served A good time was had by all!

Several of us hiked to the pinnacle. That is the highest point in the area at about 1200 feet. Those of you that hiked there know it is not a easy walk. We saw the place that originally was talked about to build the observatory for the 48 inch. It was decided later to build it next to the MMAS observatory because it is easer to get to from the house.

We will be setting up a committee to repair & rebuild our 16 inch telescope. We will need volunteers to help. We need people that have knowledge in telescope building. If not, this is a good opportunity to learn how a telescope is built and works. If you are interested in working on it please contact me at my office 973-386-1848

UACNJ Symposium

September 24, 25 and 26
UACNJ Observatories and Lecture Hall
Jenny Jump State Forest, Hope, NJ
September 25
Parlours, Seay Administration Building
Centenary College, Hackettstown, NJ
www.uacnj.org

CLUB MEETINGS

Oct. 14 - Lonny Buinis - Mr. Moonrock project
Nov. 11 - Allan Witzgall - HST: A history in Optics, Politics, and Discovery
Dec. 9 - Holiday Party
Jan. & Feb. - NO MEETINGS

Monthly Meetings are the second Thursday of each month at 7:30 p.m.
During Jan., Feb., Jul., & Aug. check the web site for specific information.

JUPITER TOOK A DOUBLE WALLOP AS AMATEURS WATCHED

Two fireballs from collisions with Jupiter in June and August provided a great show for the skywatchers who spotted them, packing a punch and suggesting the gas giant could be in for frequent punishment.

In both instances, amateur astronomers using backyard telescopes were the first to detect two small objects that burned up in Jupiter's atmosphere. Since then, the skywatchers teamed up with professional astronomers to study the fireballs, which were likely caused by rogue asteroids or comets. "Jupiter is a big gravitational vacuum cleaner," said Glenn Orton, co-author of a study of the fireballs that appears in the Sept. 9 edition of the Astrophysical Journal Letters. "It is clear now that relatively small objects — remnants of the formation of the solar system 4.5 billion years ago — still hit Jupiter frequently. Scientists are trying to figure out just how frequently." Orton is an astronomer at NASA's Jet Propulsion Laboratory, in Pasadena, Calif. [Video: Fireballs Light Up Jupiter]

The object that caused the June 3 fireball was determined to be 30 to 40 feet wide (8 to 13 meters). In fact, it was comparable in size to 2010 RF12, the second of two asteroids that flew by Earth Wednesday, and it slightly larger than the asteroid 2008 TC3, which burned up above Sudan two years ago.

The energy released by the object as it plunged into Jupiter's atmosphere was estimated at 1 quadrillion to 4 quadrillion joules (300 million to 1 billion watt-hours).
Analysis is continuing on the Aug. 20 fireball, but scientists said the size of that object was comparable to the June 3 invader.

Though each fireball packed a wallop, the energy of the June 3 crash was still five to 10 times less than from the meteor or comet that entered Earth's atmosphere in 1908 and burst over a remote part of Russia, an explosion known as the Tunguska event that knocked over tens of millions of trees.
The June 3 fireball was spotted by skywatchers Anthony Wesley in Australia and Christopher Go in Cebu, Philippines. The amateur astronomers worked with a team of pros led by researcher Ricardo Hueso, of the Universidad del País Vasco, in Bilbao, Spain, to determine the size of the fireball.
Skywatchers like Wesley and Go who are able to detect such small-size impacts can help make significant contributions to wider astronomical studies, Hueso said.

"The discovery of optical flashes produced by objects of this size helps scientists understand how many of these objects are out there and the role they played in the formation of our solar system," he explained.

Three days after Wesley and Go detected the fireball, Hueso and his colleagues looked for signs of the impact in high-resolution images from larger telescopes, including NASA's Hubble Space Telescope, Gemini Observatory telescopes in Hawaii and Chile, the Keck telescope in Hawaii, the NASA Infrared Telescope Facility in Hawaii, and the European Southern Observatory's Very Large Telescope in Chile.

The scientists analyzed the images for thermal disruptions and chemical signatures, and compared them with those seen in previous images of Jupiter impacts. They saw no signs of debris from the

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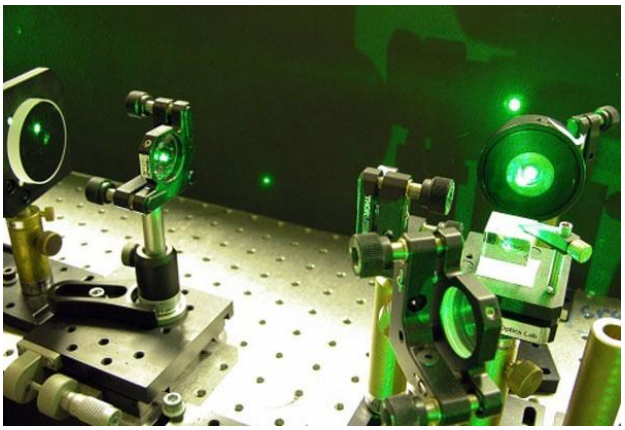
TRACTOR BEAMS GET REAL: ENERGY RAY MOVES TINY OBJECTS

Tractor beams, energy rays that can move objects, are a science fiction mainstay. But now they are becoming a reality -- at least for moving very tiny objects.

Researchers from the Australian National University have announced that they have built a device that can move small particles a meter and a half using only the power of light.

Physicists have been able to manipulate tiny particles over miniscule distances by using lasers for years. Optical tweezers that can move particles a few millimeters are common.

Andrei Rhode, a researcher involved with the project, said that existing optical tweezers are able to move particles the size of a bacterium a few millimeters in a liquid. Their new technique can move objects one hundred times that size over a distance of a meter or more.



The tractor beam in action suspends a small particle over an optics table. Credit: Courtesy of the Australian National University

The device works by shining a hollow laser beam around tiny glass particles. The air surrounding the particle heats up, while the dark center of the beam stays cool. When the particle starts to drift out of the middle and into the bright laser beam, the force of heated air molecules bouncing around and hitting the particle's surface is enough to nudge it back to the center.

A small amount of light also seeps into the darker middle part of the beam, heating the air on one side of the particle and pushing it along the length of the laser beam. If another such laser is lined up on the opposite side of the beam, the speed and direction the particle moves can be easily manipulated by changing the brightness of the beams.

Rhode said that their technique could likely work over even longer distances than they tested. "With the particles and the laser we use, I would guess up to 10 meters in air should not be a problem. The max distance we had was 1.5 meters, which was limited by the size of the optical table in the lab," Rhode said.

Because this technique needs heated gas to push the particles around, it can't work in the vacuum of outer space like the tractor beams in Star Trek. But on Earth there are many possible applications for the technology. The meter-long distances that the research team was able to move the particles could open up new avenues for laser tweezers in the transport of dangerous substances and microbes, and for sample taking and biomedical research.

"There is the possibility that one could use the hollow spheres as a means of chemical delivery agents, or microscopic containers of some kind, but some more work would need to be done here just to check what happens inside the spheres, in terms of sample heating," said David McGloin, a physicist at the University of Dundee in the U.K not connected with the Australian team.

Article submissions for future issues please send to: anthonypisano@hotmail.com

THE MOON

SEPT. 2010

Last quarter	1
New moon	7
First quarter	14
Full moon	21

OCT. 2010

Last quarter	1
New moon	8
First quarter	14
Full moon	21

NOV. 2010

Last quarter	30
New moon	7
First quarter	14
Full moon	21

LINKS

www.badastronomy.com

www.heavens-above.com

www.nasa.gov/audience/forkids/kidsclub/flash/index.html

www.space.com

www.astronomycafe.net

www.amsky.com

www.skyandtelescope.com

www.scopereviews.com

JUPITER IMPACT (CON'T)

June 3 event, which allowed them to limit their estimate of the size of the impactor.

Based on the images, the astronomers were able to agree that the flash probably came from a small comet or asteroid that burned up in Jupiter's atmosphere. They estimated the impactor had a mass of about 1 million to 4 million pounds (500 to 2,000 metric tons) — or about 100,000 times less massive than the object from a July 19, 2009, collision that created a bruise on Jupiter the size of the Pacific Ocean. Scientists now think that spectacular crash involved an asteroid about 1,600 feet (500 meters) wide.

The Aug. 20 fireball was first observed by Japanese amateur astronomer Masayaki Tachikawa and later confirmed by Aoki Kazuo and Masayuki Ishimaru.

That fireball flashed for about 1.5 seconds. The Keck telescope, which observed the impact site less than a day later, found no debris remnants.

Other assaults on Jupiter have included the 1994 incident in which the comet Shoemaker-Levy 9 broke into more than 20 pieces and pelted the gas giant repeatedly. At the time, astronomers estimated such impacts could occur on Jupiter every 50 to 250 years.
With the recent collisions occurring less than a year after the July 2009 incident, researchers are rethinking the estimates of the frequency of such impacts.

"It is interesting to note that whereas Earth gets smacked by a 10-meter-sized object about every 10 years on average, it looks as though Jupiter gets hit with the same-sized object a few times each month," said Don Yeomans, manager of the Near-Earth Object Program Office at JPL, who was not involved in the paper. "The Jupiter impact rate is still being refined, and studies like this one help to do just that."

This photo of Jupiter taken June 3, 2010 by Australian amateur astronomer Anthony Wesley shows a bright fireball from an apparent meteor or other object. Skywatcher Christopher Go of the Philippines also caught the event on video. Credit: Anthony Wesley