

*5/1/05*

***Club News:***

The Northeast Astronomy Forum at Rockland County Community College in Suffern took place on April 16<sup>th</sup> and 17<sup>th</sup>. On that Saturday we setup a table on the balcony of the field house near the entrance. Information about our club as well as outreach material from NASA was given out. We had a poster board with some pictures showing a few of our past observing sessions. Traffic by the table was brisk as people were coming into the show. Several people showed interest in the club and in attending future observation sessions. Five members helped out at our table. One of the highlights of the show was the solar observing session sponsored by Coronado in the courtyard near the field house. Solar telescopes of various sizes were setup for the public to view the sun in hydrogen alpha. The views through the scopes were very pleasing and the sun showed some nice prominences. The image below shows a view of the field house floor from our balcony position.



A club observation session was held on April 9<sup>th</sup> at Walnut Mountain Park. Eight people were present. The sky condition was very good. Most of the evening was spent observing galaxies in Leo, Coma Berenices, and Virgo. The Leo Triplet of M65, M66,

and NGC 3628 was one of the highlights of the evening as well as the edge on galaxy NGC 4565, the Whale Galaxy (NGC 4631), the Cocoon Galaxy (NGC4490 and NGC 4485), and the Whirlpool Galaxy (M51 and NGC 5195). Other deep sky objects such as the globular cluster M3, the open cluster M37, and Orion Nebula M42 were viewed as well. We also had an opportunity to see Comet Machholz. It was much dimmer than it was a few months ago. At the end of the evening we viewed Jupiter and its Great Red Spot.

The April 2<sup>nd</sup> observation session was canceled due to poor weather. The observation sessions for May are on the 7<sup>th</sup> and 14<sup>th</sup>.

Anyone interested in submitting an astronomical observation or photograph for the newsletter, please contact John at [kocis@verizon.net](mailto:kocis@verizon.net).

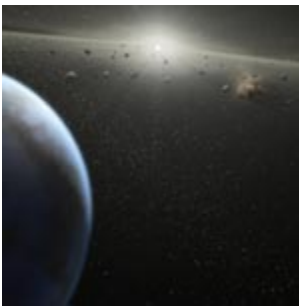
Each month the photo section of our newsletter will highlight the telescopes and equipment of club members. If you have a photo of your scope or equipment and a brief description of it that you would like to contribute please send it to John at [kocis@verizon.net](mailto:kocis@verizon.net).

The club has selection of astronomy books, Stardate audio CDs, 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](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: 2005-060 April 20, 2005

### ***NASA's Spitzer Telescope Sees Signs of Alien Asteroid Belt***



NASA's Spitzer Space Telescope has spotted what may be the dusty spray of asteroids banging together in a belt that orbits a star like our Sun. The discovery offers astronomers a rare glimpse at a distant star system that resembles our home, and may represent a significant step toward learning if and where other Earths form.

"Asteroids are the leftover building blocks of rocky planets like Earth," said Dr. Charles Beichman of the California Institute of Technology, Pasadena, Calif. Beichman is lead author of a paper that will appear in the *Astrophysical Journal*. "We can't directly see other terrestrial planets, but now we can study their dusty fossils."

Asteroid belts are the junkyards of planetary systems. They are littered with the rocky scraps of failed planets, which occasionally crash into each other, kicking up plumes of dust. In our own solar system, asteroids have collided with Earth, the moon and other planets.

If confirmed, the new asteroid belt would be the first detected around a star about the same age and size as our Sun. The star, called HD69830, is located 41 light-years away from Earth. There are two other known distant asteroid belts, but they circle younger, more massive stars.

While this new belt is the closest known match to our own, it is not a perfect twin. It is thicker than our asteroid belt, with 25 times as much material. If our solar system had a belt this dense, its dust would light up the night skies as a brilliant band.

The alien belt is also much closer to its star. Our asteroid belt lies between the orbits of Mars and Jupiter, whereas this one is located inside an orbit equivalent to that of Venus.

Yet, the two belts may have one important trait in common. In our solar system, Jupiter acts as an outer wall to the asteroid belt, shepherding its debris into a series of bands. Similarly, an unseen planet the size of Saturn or smaller may be marshalling this star's rubble.

One of NASA's future planet-hunting missions, SIM PlanetQuest, may ultimately identify such a planet orbiting HD 69830. The mission, which will detect planets as small as a few Earth masses, is scheduled to launch in 2011.

Beichman and colleagues used Spitzer's infrared spectrograph to observe 85 Sun-like stars. Only HD 69830 was found to possibly host an asteroid belt. They did not see the asteroids themselves, but detected a thick disk of warm dust confined to the inner portion of the star system. The dust most likely came from an asteroid belt in which dusty smash-ups occur relatively frequently, about every 1,000 years.

"Because this belt has more asteroids than ours, collisions are larger and more frequent, which is why Spitzer could detect the belt," said Dr. George Rieke, University of Arizona, Tucson, co-author of the paper. "Our present-day solar system is a quieter place, with impacts of the scale that killed the dinosaurs occurring only every 100 million years or so."

To confirm that the dust detected by Spitzer is indeed ground-up asteroids, a second less-likely theory will have to be ruled out. According to the astronomers, it is possible a giant comet, almost as big as Pluto, got knocked into the inner solar system and is slowly boiling away, leaving a trail of dust. This hypothesis came about when the astronomers discovered the dust around the star consists of small silicate crystals like those found in comet Hale-Bopp. One of these crystals is the bright green-colored gem called forsterite.

"The 'super comet' theory is more of a long shot," Beichman said, "but we'll know soon enough." Future observations of the star using Spitzer and ground-based telescopes are expected to conclude whether asteroids or comets are the source of the dust.

Other authors of this study include G. Bryden, T. Gautier, K. Stapelfeldt and M. Werner of NASA's Jet Propulsion Laboratory, Pasadena, Calif.; and K. Misselt, J. Stansberry and D. Trilling of the University of Arizona.

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 the California Institute of Technology in Pasadena. Caltech manages JPL for NASA. Spitzer's infrared spectrograph was built by Cornell University, Ithaca, N.Y. Its development was led by Dr. Jim Houck of Cornell.

For artist's concepts and more information, visit:  
[www.spitzer.caltech.edu/spitzer](http://www.spitzer.caltech.edu/spitzer) .

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News Release: 2005-055

April 5, 2005

### ***Durable Mars Rovers Sent Into Third Overtime Period***

NASA has approved up to 18 more months of operations for Spirit and Opportunity, the twin Mars rovers that have already surprised engineers and scientists by continuing active exploration for more than 14 months.

"The rovers have proven their value with major discoveries about ancient watery environments on Mars that might have harbored life," said Dr. Ghassem Asrar, deputy associate administrator for NASA's Science Mission Directorate. "We are extending their mission through September 2006 to take advantage of having such capable resources still healthy and in an excellent position to continue their adventures."

The rovers have already completed 11 months of extensions on top of their successful three-month prime missions. "We now have to make long-term plans for the vehicles because they may be around for quite a while," said Jim Erickson, rover project manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

Erickson cautioned though, "Either mission could end tomorrow with a random part failure. With the rovers already performing well beyond their original design lifetimes, having a part wear out and disable a rover is a distinct possibility at any time. But right now, both rovers are in amazingly good shape. We're going to work them hard to get as much benefit from them as we can, for as long as they are capable of producing worthwhile science results."

"Spirit and Opportunity are approaching targets that a year ago seemed well out of reach," said Doug McCuistion, director of NASA's Mars Exploration Program. "Their successes strengthen NASA's commitment to a vision with the ambitious targets of returning samples from Mars and sending human explorers to Mars."

Opportunity is within a few football fields' length of a region called "Etched Terrain," where scientists hope to find rocks exposed by gentle wind erosion rather than by disruptive cratering impacts, and rocks from a different time in Mars' history than any examined so far. "This is a journey into the unknown, to something completely new," said Dr. Steve Squyres of Cornell University, Ithaca, N.Y., principal investigator for the rovers' science instruments.

To reach the Etched Terrain, rover planners have been pushing the rover fast. Opportunity has overtaken Spirit in total distance driven. It has rolled more than 4.9 kilometers (3 miles) -- eight times the original goal. On March 20, Opportunity also set a new martian record of 220 meters (722 feet) in a single day's drive. Drive-distance estimates can vary by a few percent. The long drives take advantage of crossing a plain so smooth it's "like an East Coast beach," said JPL's Jeff Favretto, mission manager on the Opportunity shift in recent weeks. Also, Opportunity's solar panels, though now dustier than Spirit's, still generate enough power to allow driving for more than three hours on some days.

Spirit is in much rougher terrain than Opportunity, climbing a rocky slope toward the top of "Husband Hill." However, with a boost in power from wind cleaning its solar panels on March 9 and with its formerly balky right-front wheel now working normally, Spirit made some longer one-day drives last week than it had for months. "We've doubled our power," said JPL's Emily Eelkema, mission manager. "It has given us extra hours of operations every day, so we can drive longer and we've used more time for observations."

The jump in power output has taken some urgency out of Spirit's southward climb. With Mars now beginning southern-hemisphere spring, the Sun is farther south in the sky each day. If not for panel-cleaning, Spirit might be facing the prospect of becoming critically short of power if still on the north-facing slope by early June.

"We still want to get to the summit of Husband Hill and then head down into the 'Inner Basin' on the other side," Squyres said. "But now we have more flexibility in how we carry out the plan. Before, it was climb or die." Cresting the hill is now not as crucial for solar energy, but it still offers allures of potential exposures of rock layers not yet examined, plus a vista of surrounding terrain. In orbital images, the Inner Basin farther south appears to have terracing that hints of layered rock.

Both rovers do have some signs of wear and exposure. Spirit's rock abrasion tool shows indications that its grinding teeth might be worn away after exposing the interiors of five times more rock targets than its design goal of three rocks. Researchers probably won't know the extent of wear until Spirit's next rock-grinding attempt, which may be weeks away. Also, troubleshooting continues for determining whether Opportunity's miniature

thermal emission spectrometer is still usable despite tests indicating a problem last month. All other instruments on both rovers are still working normally.

JPL, a division of the California Institute of Technology in Pasadena, has managed NASA's Mars Exploration Rover project since it began in 2000. Images and additional information about the rovers and their discoveries are available on the Internet at [http://www.nasa.gov/vision/universe/solarsystem/mer\\_main.html](http://www.nasa.gov/vision/universe/solarsystem/mer_main.html) and <http://marsrovers.jpl.nasa.gov> .

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News Release: 2005-056

April 6, 2005

### **Cassini Mission Status Report**

NASA's Cassini spacecraft successfully flew by Saturn's moon Titan at a distance of 2,402 kilometers (1,493 miles) on Thursday, March 31. Cassini's multiple instruments are providing new views of the haze-enshrouded world.

On this recent flyby, Titan's haze was the focus of ultraviolet observations. By mapping the haze, scientists hope to learn about particle size and properties. Titan's transient clouds were also studied during the flyby.

Titan's northern hemisphere was previously imaged with Cassini's radar instrument in October 2004 and February 2005. This time, Cassini's optical cameras got their best view of the same area, as did the visual and infrared mapping spectrometer.

Titan is a prime target of the Cassini-Huygens mission because it is the only moon in our solar system with a thick, smoggy atmosphere. Cassini was launched over seven years ago and has traveled 3.55 billion kilometers (2.2 billion miles).

All 12 of Cassini's instruments have been returning data, including tantalizing images. Recently, scientists noticed episodic interferences on the composite infrared spectrometer that were traced back to the time of orbit insertion. A mirror on the spectrometer is showing some signs of jitter. The movement may be associated with the use of the spacecraft reaction wheels, used for spacecraft pointing control. A motor on one of three sensors on the magnetospheric imaging instrument and another motor on the plasma spectrometer are also not working properly. However, a workaround has been identified for the latter. All three instruments continue to function, although with some reduced level of science data collection.

"We are working to understand why the instruments are not performing properly but it is likely to be a few weeks before we have definitive answers," said Robert T. Mitchell, Cassini program manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "When

running a mission for this long, you expect to have a few glitches. Cassini has been working remarkably well considering the duration and complexity of the mission."

Cassini's next encounter is with Titan on April 16 at an altitude of 1,025 kilometers (637 miles). This will be Cassini's closest flyby of Titan yet.

The latest images from this flyby are available at: <http://saturn.jpl.nasa.gov> and <http://www.nasa.gov/cassini> .

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 mission for NASA's Science Mission Directorate, Washington, D.C.

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News Release: 2005-065

April 27, 2005

### ***NASA's Deep Impact Spacecraft Spots its Quarry***

Sixty-nine days before it gets up-close-and-personal with a comet, NASA's Deep Impact spacecraft successfully photographed its quarry, comet Tempel 1, from a distance of 64 million kilometers (39.7 million miles).

The image, the first of many comet portraits it will take over the next 10 weeks, will aid Deep Impact's navigators, engineers and scientists as they plot their final trajectory toward an Independence Day encounter.

"It is great to get a first glimpse at the comet from our spacecraft," said Deep Impact Principal Investigator Dr. Michael A'Hearn of the University of Maryland, College Park, Md. "With daily observations beginning in May, Tempel 1 will become noticeably more impressive as we continue to close the gap between spacecraft and comet. What is now little more than a few pixels across will evolve by July 4 into the best, most detailed images of a comet ever taken."

The ball of dirty ice and rock was detected on April 25 by Deep Impact's medium resolution instrument on the very first attempt. While making the detection, the spacecraft's camera saw stars as dim as 11th visual magnitude, more than 100 times dimmer than a human can see on a clear night.

"This is the first of literally thousands of images we will take of Tempel 1 for both science and navigational purposes," said Deputy Program Manager Keyur Patel at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "Our goal is to impact a one-meter long (39-inch) spacecraft into about a 6.5-kilometer wide (4-mile) comet that is bearing

down on it at 10.2 kilometers per second (6.3 miles per second), while both are 133.6 million kilometers (83 million miles) away from Earth. By finding the comet as early and as far away as we did is a definite aid to our navigation."

To view the comet image on the Internet, visit <http://www.nasa.gov/deepimpact> or <http://deepimpact.jpl.nasa.gov/> .

Deep Impact is comprised of two parts, a "flyby" spacecraft and a smaller "impactor." The impactor will be released into the comet's path for a planned high-speed collision on July 4. The crater produced by the impact could range in size from the width of a large house up to the size of a football stadium and from 2 to 14 stories deep. Ice and dust debris will be ejected from the crater, revealing the material beneath.

The Deep Impact spacecraft has four data collectors to observe the effects of the collision – a camera and infrared spectrometer comprise the high resolution instrument, a medium resolution instrument, and a duplicate of that camera on the impactor (called the impactor targeting sensor) that will record the vehicle's final moments before it is run over by comet Tempel 1 at a speed of about 37,000 kilometers per hour (23,000 miles per hour).

The overall Deep Impact mission management for this Discovery class program is conducted by the University of Maryland. Deep Impact project management is handled by the Jet Propulsion Laboratory. The spacecraft was built for NASA by Ball Aerospace & Technologies Corporation, Boulder, Colo.

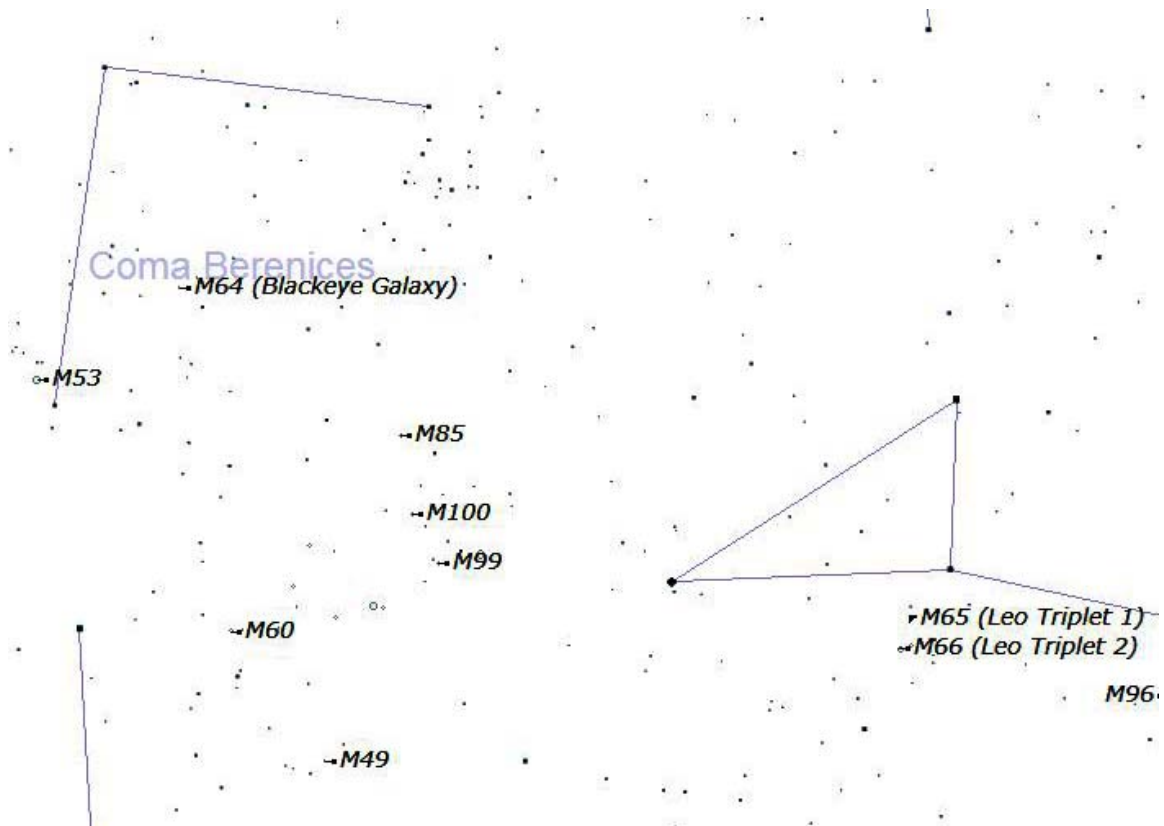
For more information about Deep Impact on the Internet, visit <http://deepimpact.jpl.nasa.gov/> .

For more information about NASA on the Internet, visit: <http://www.nasa.gov> .

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### ***Mid Evening Observing Highlights for April***

May is also good month to observe galaxies. Leo, Virgo and Coma Berenices have many galaxies within them to observe. All three constellations are almost directly overhead. The Sombrero Galaxy (M104) in Virgo can be found almost due south in the sky. The Ursa Major is high in the northern sky. The bright star Arcturus is high in the eastern sky. The keystone of Hercules is rising in the east. It contains the globular cluster M13. Gemini is setting in the west. Saturn is in the western sky and Jupiter is in the eastern sky. The image below shows the locations of some of the galaxies in Leo, Coma Berenices, and Virgo.



New moon occurs on May 8th and full moon occurs on May 23rd. The full moon will occult the bright star Antares in the constellation Scorpius at about 4:21 AM on May 24<sup>th</sup>.

### ***BARLOW BOB'S CORNER***

Barlow Bob is a member of the Rockland Astronomy Club.

Please go to <http://www.sungazer.net/041705.html>

**This is an image of the Sun taken by Greg Piepol at  
The NEAF Solar Star Party.**

Also go to <http://tinyurl.com/dvku2>

**These are pictures of the solar telescopes at this event,  
Held at Rockland Community College, Suffern, NY.**

*NASA Space Place*

# Asian Tsunami Seen from Space

by Patrick L. Barry

When JPL research scientist Michael Garay first heard the news that a tsunami had struck southern Asia, he felt the same shock and sadness over the tremendous loss of human life that most people certainly felt. Later, though, he began to wonder: were these waves big enough to see from space?

So he decided to check. At JPL, Garay analyzes data from MISR—the Multi-angle Imaging SpectroRadiometer instrument aboard NASA's Terra satellite. He scoured MISR images from the day of the tsunami, looking for signs of the waves near the coasts of India, Sri Lanka, Indonesia, and Thailand.

Looking at an image of the southern tip of Sri Lanka taken by one of MISR's angled cameras, he spotted the distinct shape of waves made visible by the glint of reflected sunlight. They look a bit like normal waves, except for their scale: These waves were more than a kilometer wide!

Most satellites have cameras that point straight down. From that angle, waves are hard to see. But MISR is unique in having nine cameras, each viewing Earth at a different angle. “We could see the waves because MISR's forward-looking camera caught the reflected sunlight just right,” Garay explains.

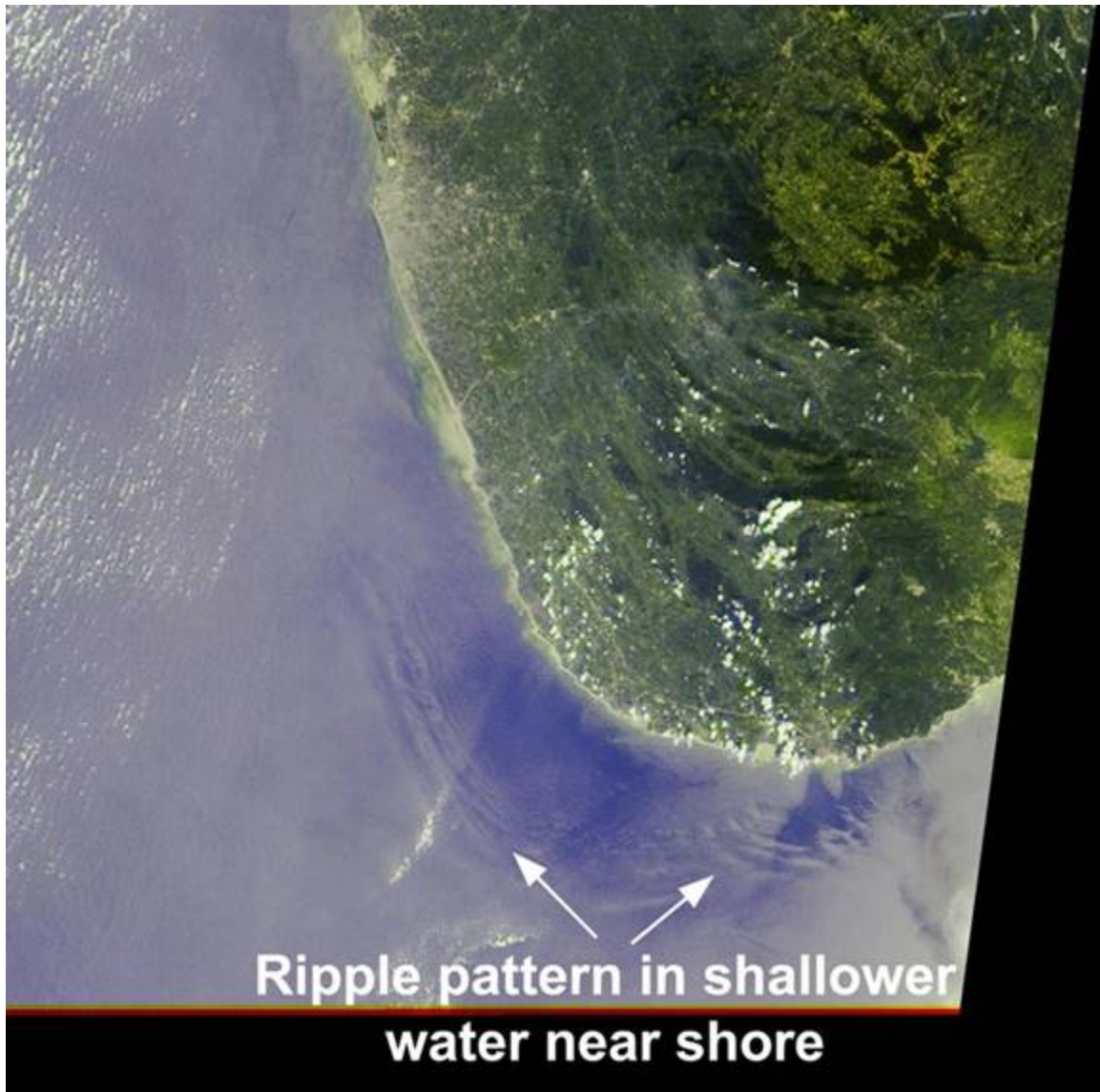
In another set of images, MISR's cameras caught the white foam of tsunami waves breaking off the coast of India. By looking at various angles as the Terra satellite passed over the area, MISR's cameras snapped seven shots of the breaking waves, each about a minute apart. This gave scientists a unique time-lapse view of the motion of the waves, providing valuable data such as the location, speed, and direction of the breaking waves.

Realizing the importance of the find, Garay contacted Vasily Titov at the National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory in Seattle, Washington. Titov is a tsunami expert who had made a computer simulation of the Asian tsunami.

”Because the Indian Ocean doesn't have a tsunami warning system, hardly any scientific measurements of the tsunami's propagation exist, making it hard for Dr. Titov to check his simulations against reality,” Garay explains. “Our images provide some important data points to help make his simulations more accurate. By predicting where a tsunami will hit hardest, those simulations may someday help authorities issue more effective warnings next time a tsunami strikes.”

Find out more about MISR and see the latest images at [www-misr.jpl.nasa.gov/](http://www-misr.jpl.nasa.gov/). Kids can read their own version of the MISR tsunami story at [http://spaceplace.nasa.gov/en/kids/misr\\_tsunami](http://spaceplace.nasa.gov/en/kids/misr_tsunami) .

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



*This December 26, 2004, MISR image of the southern tip of Sri Lanka was taken several hours after the first tsunami wave hit the island. It was taken with MISR's 46° forward-looking camera.*