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Astronomy Weather Blog

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Tuesday, October 06, 2009 10:29 AM

Countdown To Impact; Icy Moon Maps

Hello astro-nuts!

It has been awhile since I last posted anything, I know :(I had to be sure I wrote something about the upcoming LCROSS lunar impact as it will be quite a big deal! I'm also going to be writing about some of Saturn's inner moons and the new color maps that show some interesting surface details. Tomorrow is Wednesday so another Astronomy video should be out. Just a reminder that there are two ways of getting to the video; it is on the right side of the Astronomy Center, or on the Astronomy channel of the Video On Demand page.

Check This Out!

There are some goodies to look for in the sky this week; the most noteworthy would certainly be the close pairing of Saturn and Mercury in the east on Thursday morning about 45 minutes before sunrise. The two are only going to be one-third of a degree apart, and Venus will be nearby too so it will be a "picture-perfect" opportunity (weather permitting of course). The 13th-16th, rise and shine nice and early for more pretty sky shows; Venus and Saturn will be one-half a degree apart, while Mercury sits below them. On the 15th and 16th, Mercury will be close to the star Gamma Virginis, while a pretty, thin crescent moon, Venus AND Saturn will be just above the pair.

Another team has entered the Google Lunar X PRIZE competition! The 5-member Team c-base Open Moon is a team from Germany that includes businessmen, physicians and engineers. The goal of the competition is to build and launch a spacecraft capable of launching to and landing on the Moon, then travel 500 meters and transmit images and data back to Earth. Teams must be registered by December 31, 2010 in order to compete. The prize is now 20 million dollars for the team who successfully completes the competition. After December 31, 2012, the prize decreases to 15 million dollars for the first team and 5 million for the second team. The deadline for the prize is then December 31, 2014. There are currently 20 teams competing, with the possibility of many more to come!

Those of you who are planning a trip to Kennedy Space Center around October 8th may want to stop in and bid to win a huge space shuttle statue at the Shuttles Orbiting the Space Coast Auction! The auction is being held by the Astronaut Scholarship Foundation as part of the conclusion to its Shuttles Orbiting the Space Coast program. More than twenty of its 35 individually designed 8-foot shuttle statues are up for grabs at this auction. Admission to the auction is \$20 dollars and you can register online to be eligible to bid, and you can bid either in person or online! The shuttles are divided into groups and each group closes at a different time on October 8th. Which ones would you bid on? I absolutely love numbers 2, 9, 14 and 20! Good luck to all the bidders!

Astronews!

As many of you know, the Lunar Crater Observing & Sensing Satellite (LCROSS) "shepherding spacecraft" and a Centaur rocket upper stage, are scheduled for lunar impact this coming Friday! There will be a few ways that you can watch the show, so be sure to check it out! One way is of course to check out NASA TV; you may have it on your cable network, but if not, its available on NASA's website. Coverage begins at 6:15am eastern time (3:15am Pacific) with the first hour being expert commentary, status reports and various camera views from LCROSS. After LCROSS and the Centaur separate, the first impact will be the Centaur stage around 7:30am eastern time (4:30am Pacific) within the Cabeus crater around the lunar south pole. The Centaur impact is expected to produce quite a display with an impact flash and a debris plume that could reach as high as six miles! LCROSS will be passing through this plume and scanning its composition; the hunt is on for the water molecules and other possible elemental compounds. Four minutes later, LCROSS will impact the surface. This impact will be less "flashy" with a smaller debris plume, mainly because of the huge difference in weight of the two spacecraft (more than 4,800 pounds for the Centaur stage, and just over 1,500 pounds for LCROSS). Hubble, LRO and many Earth-based telescopes will be viewing the show as well, so look for images from that to be released!

Perhaps a more exciting way to see the show is to grab your own telescope! If you have a scope ten inches in diameter or larger, you may be able to see the debris plumes following the impacts. The initial impact explosions will likely be hidden but you can see the plume as it rises from the crater. The best places to be as far as location include the Pacific

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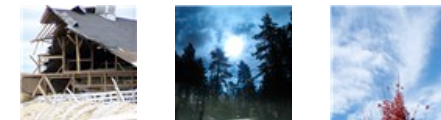
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Ocean and western North America. Farther east, we're heading into daylight as the impact occurs so telescopic viewing would be more difficult. If any of you have imaging capabilities, see if you can snap a few pictures; I'd love to see them! Being in central Pennsylvania, and having a 6" reflector keeps me out of the running for observing but I will be watching NASA TV! Lots more information on the mission can be found at the LCROSS project [website](#), check it out! (Try out the "Impact!" section, pretty neat stuff about the expectations for the plumes following impact). The video blog below goes into some details about the LCROSS mission itself.

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From Luna we head all the way out to the inner moons of Saturn; Mimas, Enceladus, Tethys, Dione and Rhea. New global maps of these icy worlds have recently been produced and give us some new views and lots of new information about them. Intricate patterns of color across each of the moons indicate the various impacts that certain particles have had on them. The idea behind creating the maps was to gain some insight into the dynamics of these fine particles and grains; one interesting idea involved how Rhea's ring system and the particles within it may have affected its surface features. The images were created during the first 4 years of the Cassini mission; the resolutions are between 400 and 750 meters and were created using a spectral range from infrared (IR) to ultraviolet (UV). By combining maps of varying spectral wavelengths, a final map of the "redness" of the moons' surfaces was produced. All the moons with the exception of Mimas had quite a bit of this redness on what are known as their trailing hemispheres (per NASA, that is the hemisphere that faces backwards, away from the direction of motion of a satellite which keeps the same face towards a planet). Some ideas about what caused this include impacts by E-ring grains on the leading hemisphere (same as trailing hemispheres, but it faces forward) as the moons moved through them in their orbits, as well as the radiation by charged particles. Some other features that caught the eyes of astronomers included a bright (in the UV band) lens-shaped band stretching across the equatorial area of Mimas, and one that shows up dark across the same area on Tethys. Some bright banded features (in UV band) showed up near Rhea's equator and resemble "bluish splotch-marks".

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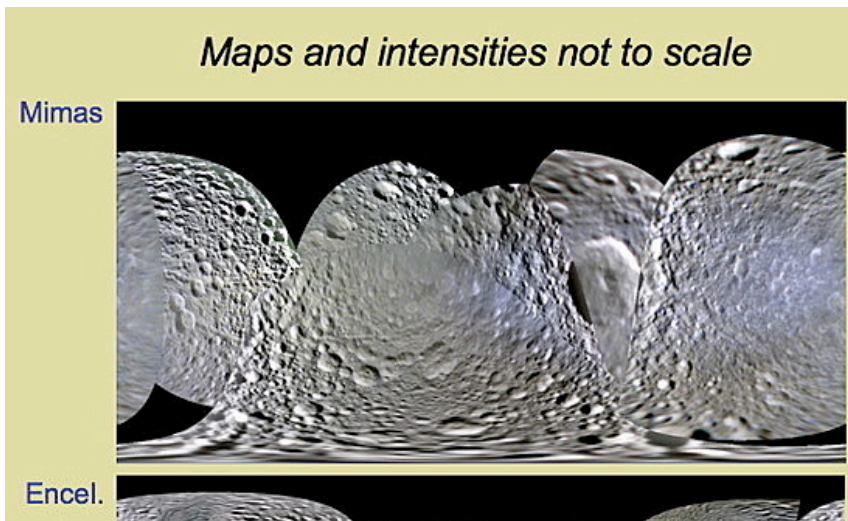
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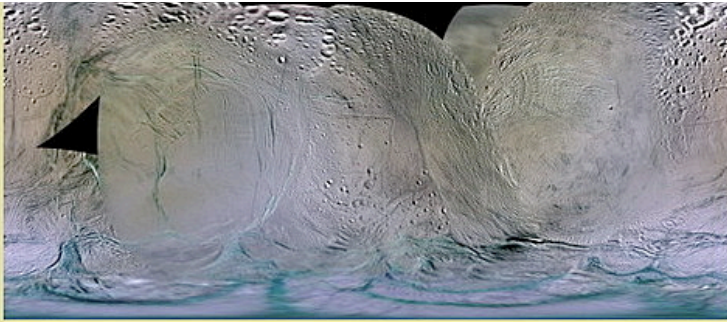
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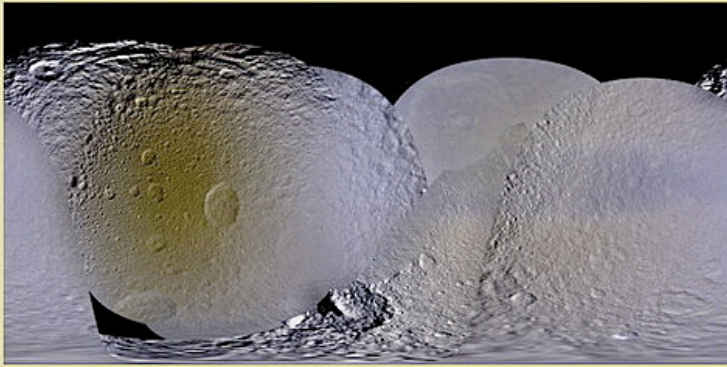
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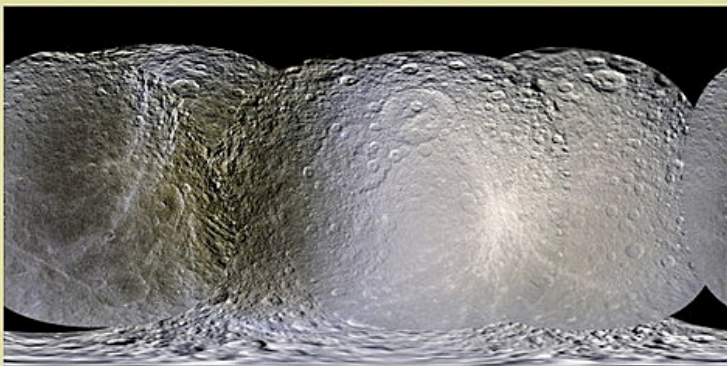
Tethys



Dione



Rhea

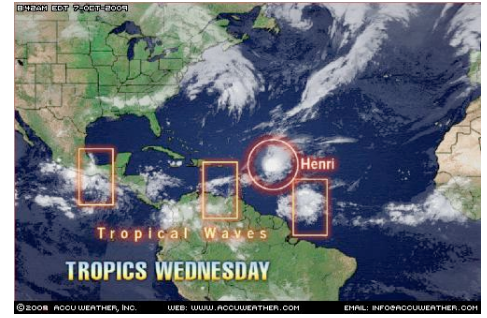


Enhanced Natural Color (IR-GR-UV)

Enhanced Color projections of the moons-NASA

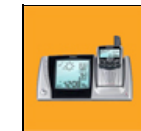
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Mimas



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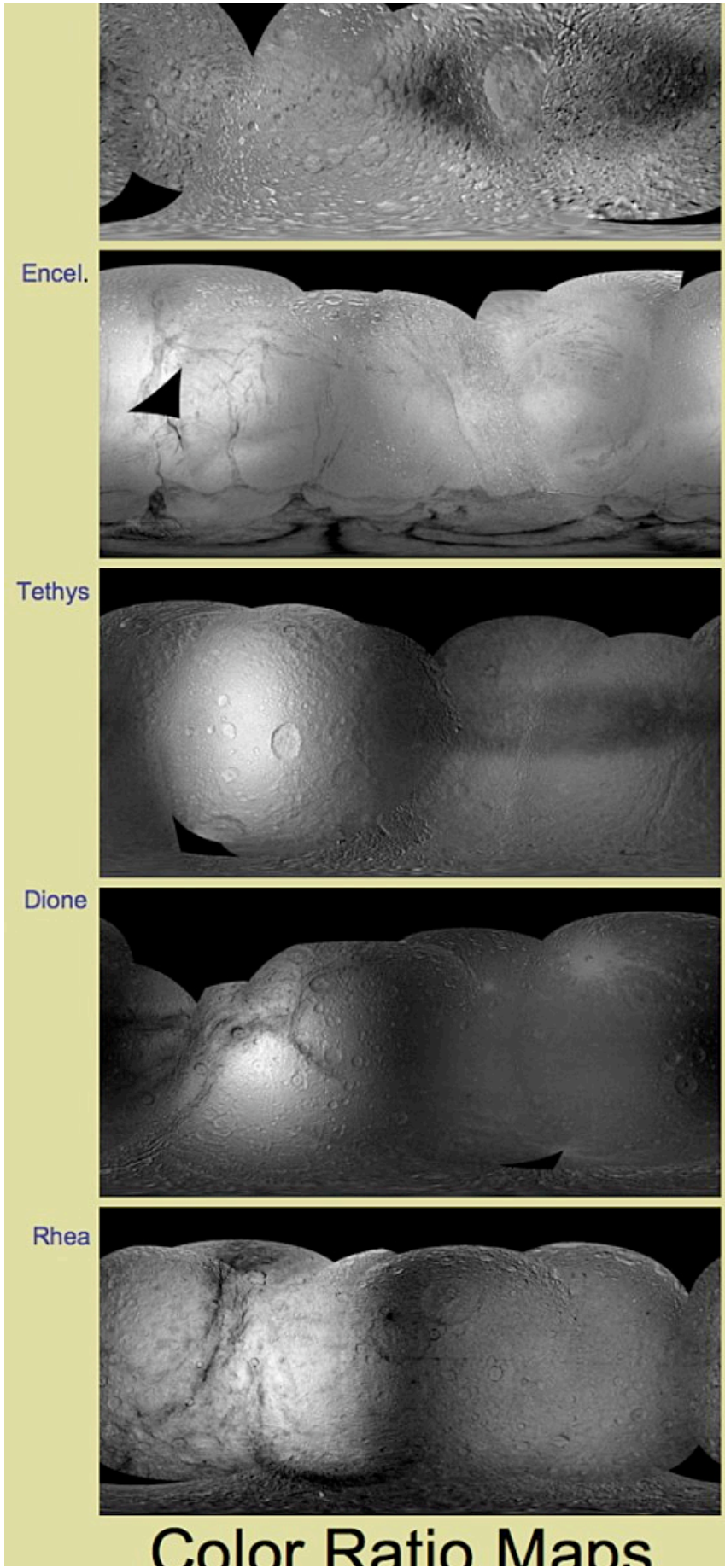
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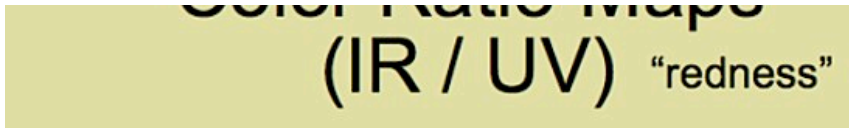
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Redness Map projections of the moons-NASA

Keep your eyes to the sky and enjoy the view!

~Lisa C.

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Posted by Lisa Beightol on Tuesday, October 06, 2009 10:29 AM

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