

Triton Fun Company

Science Newsletter April 2008

# Science Newsletter

## April 2008

### The Bizarre Moons of Saturn: Alien worlds being studied daily

V. Adderly

#### Special points of interest:

Saturn's babies

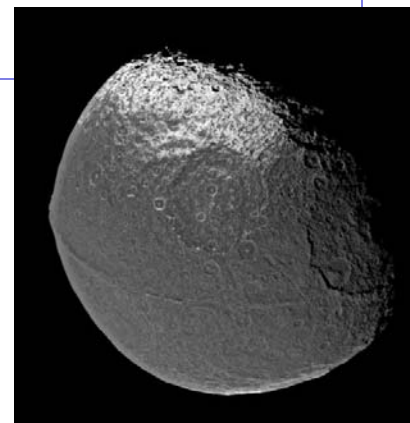
Triton Fun stuff

Superfluous questions

Saturn is a fantastic, alien planet. It has a spectacular set of rings running around it made of snowballs of various sizes, a butter-scotch atmosphere, and a collection of moons that are bizarre-enough-looking to rival any world seen in science fiction. The **Pioneer 11** spacecraft first explored the Saturn system in 1979. It made many discoveries about the magnetic field around Saturn, the atmosphere, and obtained some preliminary information about its moons. However, major discoveries about the moons of Saturn were made later by the **Voyager** spacecraft which first visited Saturn in 1980. It was obvious that the moons were icy worlds with some very unusual geology. Also, the largest moon, **Titan**, was explored in detail for the first time. Titan is the only moon in the solar system with a substantial atmosphere; it has a surface density greater than that of Earth's atmosphere. Spectral studies of Titan by the IRIS instrument on Voyager showed the presence of an exotic brew of organic molecules: methane, ethane, propane, acetylene, propylene, methylacetylene, cyanoacetylene, cyanogen, benzene, acetonitrile, polyynes and many others. Some of the organics clump together to make the haze layers seen in Titan's atmosphere. This makes the atmosphere cloudy and hides the surface from view.

The Saturn system is currently being explored by NASA's Cassini spacecraft. Cassini was launched in 1997 and arrived at Saturn in 2004. It has been going about its work of orbiting the planet without much fanfare; this is a pity, as Cassini has been anchored at Saturn and been able to make repeated flybys of the moons as well as studying the atmosphere and magnetosphere of the planet in great detail. This mission has made some astonishing discoveries on a daily basis; it deserves more press...

Close-up pictures of the moon **Hyperion** revealed a strange, spiky landscape, with deep craters and holes whose formation mechanisms are still not understood. **Enceladus**, a relatively tiny moon, is spouting geysers on a continual basis, Old Faithful spritzing ice particles and other materials into the vacuum of space. Since Enceladus should not be large enough to have residual heat from its formation, it is not clear what is driving the geysers, i.e. what is the energy source. Other moons show cracks and color variations and mountain ranges where they are not expected. It was known from Voyager that **Iapetus** has a dramatic color variation on its surface (areas white as snow and black as coal) but Cassini also revealed an equatorial ridge, a



**Iapetus—moon of Saturn**  
The dramatic color contrast is still not understood

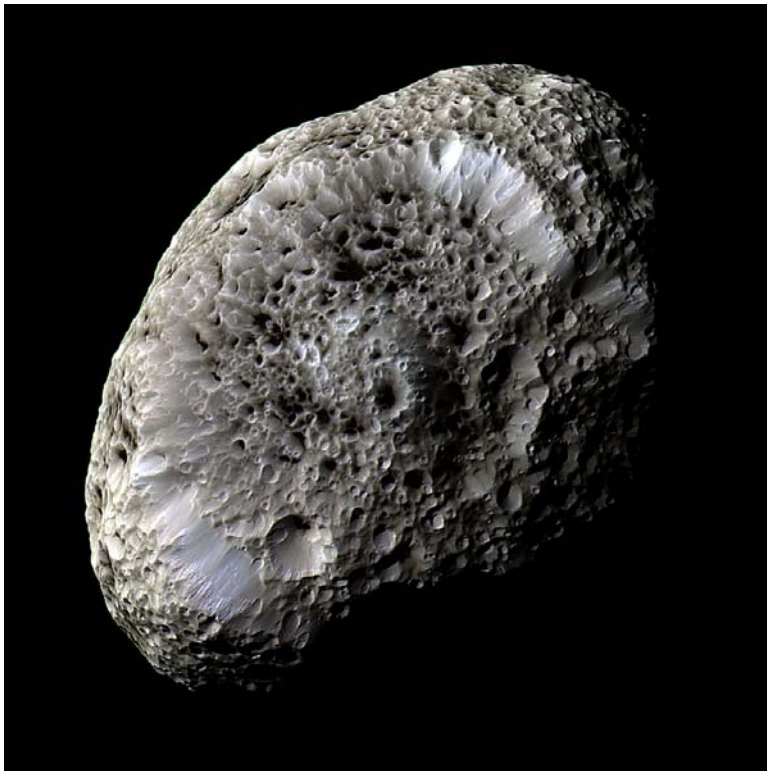
sort-of middle age bulge that is also unexplained. Cassini had a probe connected to it called Huygens that detached from its orbiter section and flew to Titan and landed on its surface. It took measurements of its atmosphere on the way down and took the very first pictures from the surface of Titan revealing a smoggy, orange world with rounded rocks and boulders. There are endless mysteries in the story of the moons of Saturn; Cassini is studying them daily. Intense exploration is going on "as we speak". NASA is out there in the depths of space experiencing alien worlds. We should be paying more attention to this dramatic and exciting journey to such a weird and interesting environment.

We are always looking for contributors to the Science Newsletter. If you would like to write an article about a science subject you are excited about, or contribute a superfluous question, or if you would like to be on our mailing list for future newsletters, please e-mail us at:

[info@tritonfun.com](mailto:info@tritonfun.com)

Weird moons of Saturn: continued

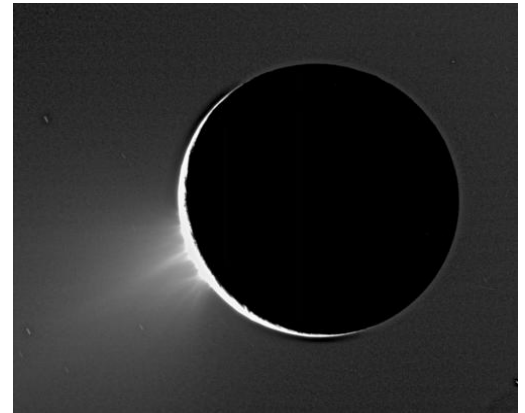
Photos/Info: NASA/JPL/SSI/ESA



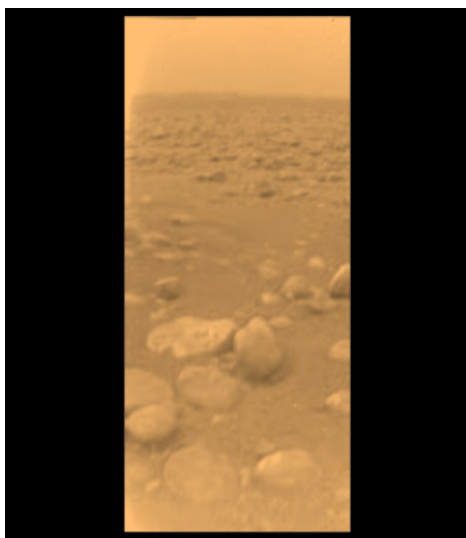
**Hyperion—moon of Saturn**  
OK, explain that ...!



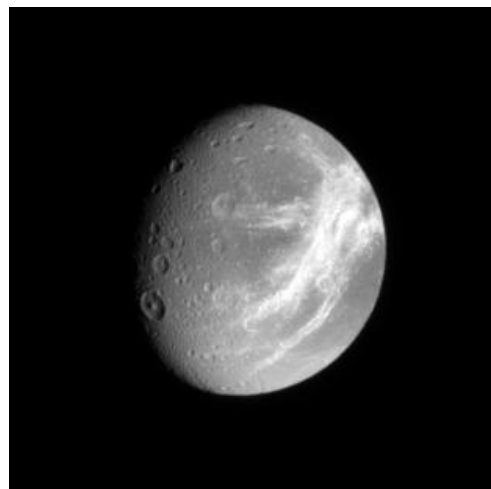
**Pandora—moon of Saturn**  
One of the smaller moons,  
with a spud-like shape



**Enceladus— moon of Saturn**  
Old Faithful of the solar system: geysers  
are erupting all the time releasing water ice  
particles and other materials into space; the  
plumes are substantial enough to affect Sat-  
urn's magnetic field lines in their vicinity



**Titan—moon of Saturn**  
Astonishing picture from the sur-  
face of a distant, smoggy moon



**Dione—moon of Saturn**  
Fascinating cracks in the  
surface reveal its icy crust  
and tectonic nature

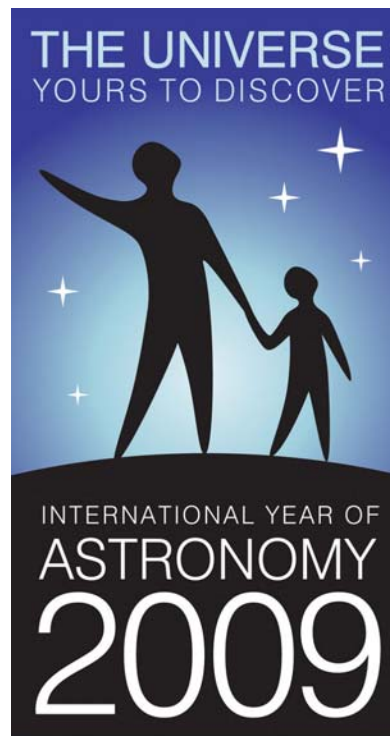
## TRITON FUN PRODUCTS

2009 has been declared the "International Year of Astronomy". Events and activities to further the excitement of astronomy are being planned by IYA committees in over 100 countries. The logo for the IYA2009 is shown below. For more info on upcoming IYA2009 events, go to: <http://www.astronomy2009.org>

Triton Fun is an authorized distributor of T-shirts, sweatshirts and long-sleeve tees sporting this new logo. Part of the proceeds from the sale of these shirts will go to support astronomy clubs and astronomy activities connected with IYA2009 in California.

These shirts can be ordered online on our website:  
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\*\* Send us your superfluous questions for a future issue ! They can be on any subject. The funnier, the better. M.D., our editor, appreciates the help and will send you a free Triton Fun coffee mug as compensation for your question. Or write an article for us and be read by professional and amateur astronomers and scientists in the U.S. and Canada ! \*\*

## Superfluous Questions:

1) "Scousers" is a nickname for people who live *where* :

- a) in Brussels    b) in Edinburgh    c) in Liverpool    d) in Newcastle

2) In the TV show *Will and Grace*, Jack McFarland's middle name is:

- a) Henry    b) Alan    c) Phillip    d) James

3) What year was Daylight Savings Time first observed in the United States ?

- a) 1946    b) 1949    c) 1918    d) 1925

4) In the movie "The Andromeda Strain", Dr Ruth Leavitt has an illness that she keeps secret from the other scientists. What was it ?

- a) multiple sclerosis    b) tuberculosis    c) epilepsy    d) malaria

→ ANSWERS in next months issue of the Science Newsletter ! ←---

\*\* ANSWERS to March's Superfluous Questions: 1. c) Joe Carter 2. a) 1901 3. c) cells in pancreas 4. c) Suzanne Pleshette