

Triton Fun Company

Science Newsletter April 2007

# Science Newsletter

## April 2007

### Galactic Cannibals

A. Shepherd

#### Special points of interest:

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What if you moved into a new part of town only to discover the neighbors are cannibals? Guess what, you're already there! As it turns out, our galactic neighborhood, the Milky Way, is a giant cannibal that eats other galaxies.

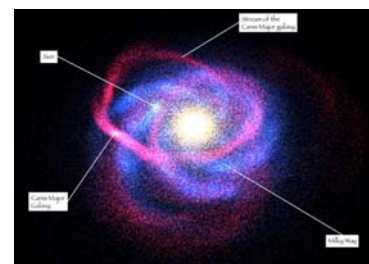
Last year, the Sloan Digital Sky Survey (SDSS-II) mapped a faint structure, containing hundreds of thousands of stars spread out over an area of the Milky Way nearly 5,000 times the size of a full moon. These stars, strewn about approximately 30,000 light years from Earth, turn out to be the bones of a dwarf galaxy that was eaten alive by the Milky Way. Located above the Milky Way's disk toward the constellation Virgo, the structure has been named the "Virgo Stellar Stream" or "Virgo Overdensity." In another million years, it will have been completely absorbed by the Milky Way.

Of course, the Virgo Stellar Stream did not just move into the neighborhood recently. It only became visible last year when SDSS began looking at the Milky Way with "3D glasses," a photometric parallax method that uses the colors and apparent brightness of stars to infer their distances. SDSS measured distances to 48 million stars and built a 3D map of the Milky Way that made the structure pop into view.

This is not the first offense for the Milky Way either. In fact, we're beyond strike three. In 2003, an international team of astronomers discovered the remnants of the Canis Major dwarf galaxy, about 25,000 light years away from the solar system. And in 1994, scientists from Cambridge University discovered the Sagittarius dwarf galaxy on the far side of the Milky Way, about 75,000 light years from Earth. In fact, the outer Milky Way is riddled with streams and lumps of stars that are vestiges of dissolving dwarf galaxies. They orbit the Milky Way as they slowly sink into the galactic disk.

The Big Bang did not give birth to fully formed, mature galaxies. Rather, they continue to evolve and grow with the expanding universe. The larger galaxies are building up their disks by absorbing smaller satellite galaxies that fall prey to their gravitational effects.

As it attracts and eats dwarf galaxies like a pitcher plant, the Milky Way continues to gain weight. But eventually, what goes around comes around. Scientists project that the Milky Way will meet up with another cannibal in the Local Group of galaxies, the nearby Andromeda Galaxy, in three to four billion years.



#### Canis major dwarf galaxy:

It is traveling through the region of our Milky Way galaxy which is likely to have gravitationally disruptive effects on it

Photo: NASA, IPAC, ULP

But don't expect our sun and the other stars of the Milky Way to collide with the Andromeda stars. Rather, the gravitational mayhem will tear apart the Milky Way's spiral arms and shred its pinwheels as the two cannibals merge to form a new galaxy over the course of about a billion years.

Another possible fate of the Milky Way is that it could fall into the hands of a whole gang – the Virgo Supercluster of galaxies, of which the Local Group is a part, in 50 to 80 billion years. Be sure to check this newsletter for updates as we approach the 50-billion year mark!

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:

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

## Cannibal galaxy, continued

More info on the galaxy-eating Milky Way is available here:

The Sloan Digital Sky Survey reveals a new Milky Way neighbor. *Sloan Digital Sky Survey*, January 9, 2006, <http://www.sdss.org/news/releases/20060109.virgooverdensity.html>.

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## More great stuff from the New Horizons mission to Pluto !

The New Horizons mission to Pluto continues apace. After making an historic and gravity-assisting flyby of Jupiter in January 2007, the spacecraft is now off to Pluto. It should arrive there in July 2015. More images from the flyby are being released on their website. Go to these sites for updates:

<http://pluto.jhuapl.edu/index.php>

[http://www.nasa.gov/mission\\_pages/newhorizons/main/index.html](http://www.nasa.gov/mission_pages/newhorizons/main/index.html)

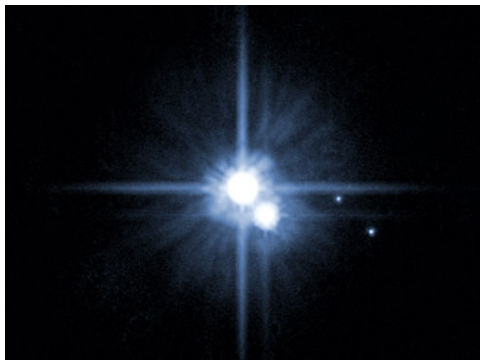
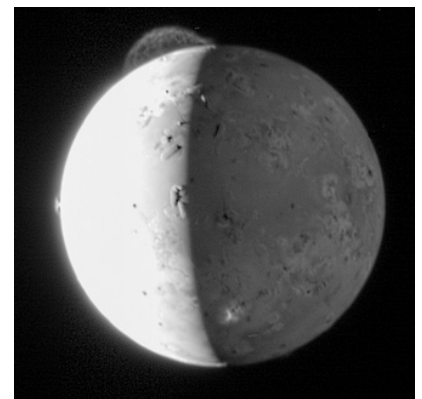


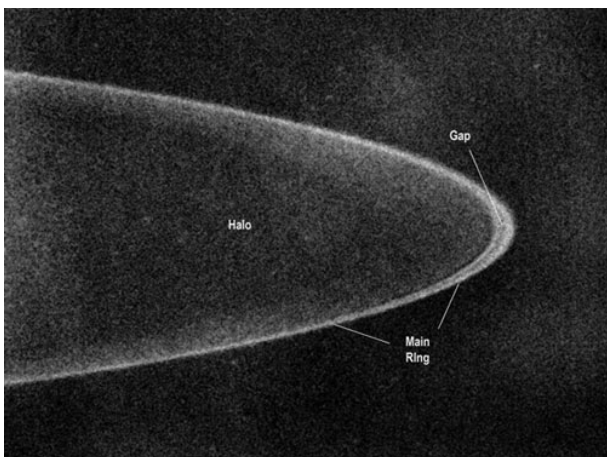
Image of Pluto and its 3 moons taken by the Hubble Space Telescope in 2006, confirming the existence of the 2 new moons from their first detection in 2005.



**Left:** Two satellites of Jupiter are seen in this beautiful image taken by the New Horizons spacecraft. Reddish Io is seen with a spectacular volcanic spout emanating from its surface. Remarkable details can be discerned on its surface. To the right and below is Europa, with a smoother and more featureless surface. Io's surface contains silicates and sulfur-containing materials, and no water. Europa is covered with water, albeit in the form of ice.



**Right:** A close-up of Io showing incredible detail in a volcanic plume, taken on February 28, 2007, just a few hours after closest approach to Jupiter. A lacy structure can be seen. The plume is around 180 miles high. Two other smaller plumes are visible, one at about the 9 o'clock position and the other at center bottom. Io is the most volcanically active body in the solar system. It is constantly being squeezed by resonances with Jupiter and the other satellites which cause the plumes and lava to be erupted out of the many volcanic calderas on the surface.



**Above:** This is the most detailed image of the dusty ring of Jupiter ever taken by any spacecraft. New Horizons snapped this photo on February 28, 2007. It shows the thin ring and a sheet of fine, dark dusty material filling the ring all the way down to Jupiter's cloud tops.

Stay tuned for more fascinating results from the explorations of this distant spacecraft !

## TRITON FUN PRODUCTS !

See our unique Sputnik 50th anniversary shirt: on sale now !

Our Triton Fun featured product this month is our incredibly interesting and unique **Sputnik 50th anniversary** shirt. This year of 2007 is the 50th anniversary of the launch of Sputnik 1 by the USSR in 1957. This was the first manmade object to go into space. Be the first kid on your block to be wearing this shirt celebrating the beginning of the space age. Order it at: <http://www.tritonfun.com> or call: 800-778-0560



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Planets T-shirt



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Planets Sweatshirt



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Magnetosphere hats



Sun visors -flippable



Nifty bottle holders



Spacecraft T-shirt



Magnetosphere hats

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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. In the TV show, "Will and Grace", which of these is Karen Walker's maiden name?  
a) Delaney    b) St Croix    c) Popiel    d) Mullally
2. What year did Canada suddenly switch from driving on the left-hand side of the road (as in England) to the right-hand side of the road (as in America) ?  
a) 1935    b) 1922    c) 1951    d) they still don't
3. What does TV talk-show host Greg Behrendt say at the end of every show ?  
a) Be Seeing Ya    b) Till next time    c) We're outta here    d) Continue rocking
4. What is syzygy ?  
a) an allergy to cole slaw    b) a line-up of 3 or more planets    c) ancient language    d) folk dance in Albania

--> ANSWERS in next months issue of the Science Newsletter ! <---

\*\* ANSWERS to March's Superfluous Questions: 1. b) Alley Cat 2. c) eggs 3. c) Pittsburgh 4. a) Abell 1835IR1916