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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



## MESSAGE FROM THE PRESIDENT

*Ron Russo, President*

**S**ummer is here again for those of you that do not like to observe in the cold. On July 10 MMAS will be observing at the UACNJ. For the best dark sky observing in NJ bring your telescope to Jenny Jump. The UACNJ speaker program will start at 8:00PM. I do ask that you please try to attend. Many of our members do not get a chance to do much dark sky observing.

On August 21 the MMAS will hold its annual picnic at Jenny Jump starting at 3:00PM. Night observing that will start at 8:00PM. The MMAS will provide all food & drink. There is no charge & our members do not have to bring anything.

Members are encouraged to bring their families to this event.

In the past few years the MMAS membership has declined for many reasons. We all have to work together to find new members. The club has many activities that are planned for our members & the public. Our outreach programs benefit public schools, Boy and Girl Scouts, and other organizations. We always have a good time and both children and adults appreciate the opportunity to look at the planets, stars & sky objects. If you know anyone that has an interest in astronomy encourage them to come to our meetings & other activities.

## CLUB MEETINGS

- July 10 - Jenny Jump observing night
- Aug. 21 - Jenny Jump picnic 3-6PM
- Sept. 9 Grace Casalino - TBA
- Oct. 14 - Lonny Buinis - Mr. Moonrock project
- Nov. 11 - Allan Witzgall - HST: A history in Optics, Politics, and Discovery

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.

# COSMIC SCOPE SPIES HOLE IN SPACE

**A** vast hole in space has been unexpectedly discovered in a part of the universe thought to be packed with a cloud of dense gas and dust -- the latest in a string of cosmic finds by the European Herschel infrared space telescope.

The surprising hole in space has provided astronomers with a new glimpse at the end of the star-forming process.

"No one has ever seen a hole like this," said study team member Tom Megeath of the University of Toledo in Ohio. "It's as surprising as knowing you have worms tunneling under your lawn, but finding one morning that they have created a huge, yawning pit."

Stars are born in dense clouds of dust and gas, and while jets of gas have been spotted coming from young stars, the process of how a star uses this gas to disperse surrounding debris and emerge from its birth cloud has not been understood.

This latest discovery by Herschel, an infrared space telescope built by the European Space Agency, may be an unexpected step in the star-forming process.

A cloud of bright, reflective gas, known to astronomers as NGC 1999, is located next to a black patch of sky. For most of the 20th century, these black patches were understood to be dense clouds of dust and gas that block light that would normally pass through.

As Herschel's infrared eye looked in the direction of NGC 1999 to study nearby young stars, the cloud continued to look black, even though the telescope's infrared technology is designed to penetrate through such dense cloud material. This meant that either the cloud was immensely dense, or Herschel had happened upon a previously unexplained phenomenon.

Astronomers continued their investigation using ground-based telescopes and found the same results when looking at the patch of gas. This led to the conclusion that the patch looks black not because it is an extremely dense pocket of gas, but because it is truly empty -- something had blown a hole through the cloud.

The astronomers think the hole must have been opened when the narrow jets of gas from some of the young stars in the region punctured the sheet of dust and gas that forms NGC 1999. The powerful radiation from a nearby mature star may have also helped to create the hole, researchers said.

Whatever the exact cause of the hole may be, the discovery may be an important glimpse into the way newborn stars shake off their birth clouds that helps astronomers develop a better understanding of the entire star-forming process, researchers said. Herschel is the largest and most powerful infrared telescope in space today. The European Space Agency launched the observatory into orbit in May 2009.



NGC 1999 is the green tinged cloud towards the top of the image. The dark spot to the right was thought to be a cloud of dense dust and gas until Herschel looked at it. It is in fact a hole that has been blown in the side of NGC 1999 by the jets and winds of gas from the young stellar objects in this region of space.



Can you find what's wrong with this picture?

# HUBBLE BUILDS 3D DARK MATTER MAP

**D**ark matter makes up the majority of mass in our universe. However, we cannot directly measure the stuff as it doesn't interact with electromagnetic radiation (i.e. it doesn't emit or reflect any light), but we can indirectly observe its presence.

In this beautiful multicolored Hubble Space Telescope image, the distribution of mostly dark matter has been calculated and mapped. Basically, the location and density of anything with mass has been plotted in a 3D representation of the cosmos.

But if the majority of matter (i.e. dark matter) cannot be seen, how did Hubble work out its location?

Hubble is making use of a characteristic of space-time as predicted by Einstein's theory of general relativity. Matter bends space-time -- much

like a bowling ball will warp a suspended rubber sheet because it's heavy -- and as light travels through this bent space-time, the light's path will be deflected. This deflection can be directly observed.

For example, if a distant galaxy emits light in our direction, it may be diverted slightly in its otherwise

straight path. Like a glass lens being placed in front of a lightbulb, the galactic light will distort from our viewpoint -- the heavier the mass, the greater the distortion.

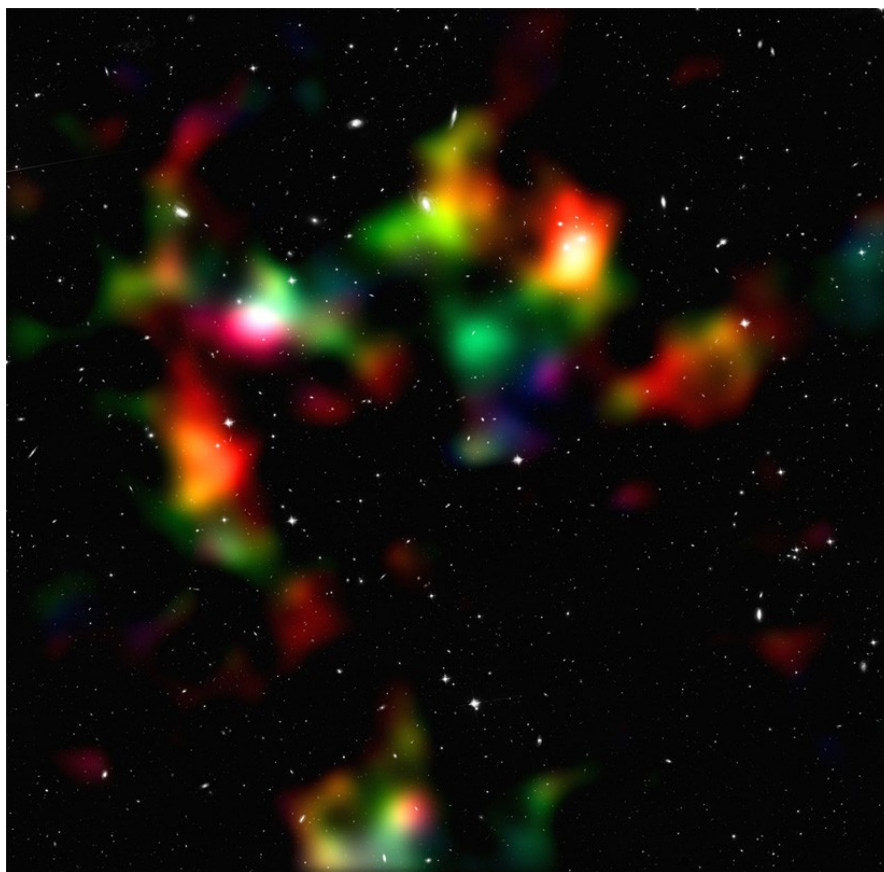
This distortion is known as "gravitational lensing" and it can be used as a tool to detect things like galaxies, black holes and, you guessed it, dark matter.

By combining the Hubble observations of gravitational lenses with spectroscopic red shift observations from telescopes on Earth, the 3D location of clumps of mass (dark matter, galaxies, black holes etc.) can be found. In this case, the white, cyan, and green regions are closer to Earth than those indicated in orange and red.

To produce this scene, astronomers used Hubble to survey over 446 000 galaxies, notching up over 1000 hours of observing time on

the space telescope. This is the largest ever survey carried out by Hubble.

Red-shift data were collected for 194 000 galaxies in the same field of view by ground-based observatories. The further away the galaxy, the faster it's moving away from us (as the universe is expanding), making that galaxy appear



Article submissions for future issues please send to: [anthonypisano@hotmail.com](mailto:anthonypisano@hotmail.com)

**Great shots to view from the Cassini Spacecraft**  
[http://www.boston.com/bigpicture/2010/05/checking\\_in\\_on\\_saturn.html](http://www.boston.com/bigpicture/2010/05/checking_in_on_saturn.html)



# Night Sky Network

Astronomy Clubs bringing the wonders of the universe to the public



## THE MOON

### JUL. 2010



**Last quarter** 4  
**New moon** 12  
**First quarter** 18  
**Full moon** 26

### AUG. 2010



**Last quarter** 3  
**New moon** 10  
**First quarter** 17  
**Full moon** 24

### SEPT. 2010



**Last quarter** 1  
**New moon** 8  
**First quarter** 15  
**Full moon** 22

## LINKS

[www.badastronomy.com](http://www.badastronomy.com)

[www.heavens-above.com](http://www.heavens-above.com)

[www.nasa.gov/audience/for\\_kids/kidsclub/flash/index.html](http://www.nasa.gov/audience/for_kids/kidsclub/flash/index.html)

[www.space.com](http://www.space.com)

[www.astronomycafe.net](http://www.astronomycafe.net)

[www.amsky.com](http://www.amsky.com)

[www.skyandtelescope.com](http://www.skyandtelescope.com)

[www.scopereviews.com](http://www.scopereviews.com)

## GOOD HEAVENS! JUPITER HAS LOST A STRIPE

Interplanetary observers have noted that gas giant Jupiter has looked a little naked of late -- it's mysteriously lost one of its iconic stripes.

The anomaly is noticeable for anyone with even a "relatively small telescope," according to The Planetary Society, although what constitutes a "small telescope" for the Planetary Society doesn't necessarily fit under a Christmas tree.

Jupiter's disrobing began somewhere around June last year when the South Equatorial Belt began to fade. By May this year, it had disappeared completely, leaving only the North Equatorial Belt protecting Jupiter's modesty.

It was common knowledge that the belt was disappearing, but flirty Jupiter ducked behind the sun for three months and it was only in recent weeks that eager observers could see to what extent its belt had vanished.

Noted Jupiter watcher Anthony Wesley -- the man who discovered its "scar" last year -- has tracked the disappearing belt from his back yard two hours south of Sydney, Australia. And it's his before-and-after photos which are the most likely you'll come across on the web if you search for the phenomenon.

"It was obvious last year that it was fading. It was closely observed by anyone watching Jupiter," he said. "There was a big rush on to find out what had changed once it came back into view."

Mr Wesley said while it was a mystery as to what had caused the belt to fade, the most likely explanation was that it was linked to storm activity that preceded the change.

While exciting for astronomers, it's not uncommon: Jupiter has lost or regained one of its belts every 10 or 15 years.

"The question now is when will the South Equatorial belt erupt back into activity and reappear?" Mr Wesley said, adding that it could be anywhere up to 15 years.

