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Cassini Images Bizarre Hexagon on Saturn

03.27.07

Pasadena, Calif. -- An odd, six-sided, honeycomb-shaped feature circling the entire north pole of Saturn has captured the interest of scientists with NASA's Cassini mission.

NASA's Voyager 1 and 2 spacecraft imaged the feature over two decades ago. The fact that it has appeared in Cassini images indicates that it is a long-lived feature. A second hexagon, significantly darker than the brighter historical feature, is also visible in the Cassini pictures. The spacecraft's visual and infrared mapping spectrometer is the first instrument to capture the entire hexagon feature in one image.

Image right: This nighttime view of Saturn's north pole shows a bizarre six-sided hexagon feature encircling the entire north pole. The red color indicates the amount of 5-micron wavelength radiation, or heat, generated in the warm interior of Saturn that escapes the planet. Image credit: NASA/JPL/University of Arizona

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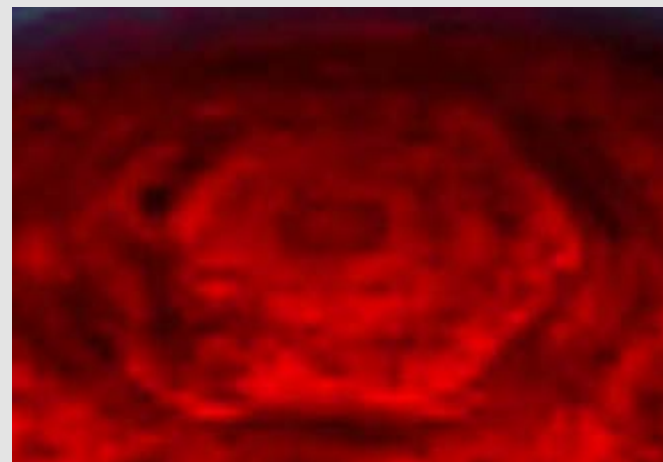
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"This is a very strange feature, lying in a precise geometric fashion with six nearly equally straight sides," said Kevin Baines, atmospheric expert and member of Cassini's visual and infrared mapping spectrometer team at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "We've never seen anything like this on any other planet. Indeed, Saturn's thick atmosphere where circularly-shaped waves and convective cells dominate is perhaps the last place you'd expect to see such a six-sided geometric figure, yet there it is."

The hexagon is similar to Earth's polar vortex, which has winds blowing in a circular pattern around the polar region. On Saturn, the vortex has a hexagonal rather than circular shape. The hexagon is nearly 25,000 kilometers (15,000 miles) across. Nearly four Earths could fit inside it.

The new images taken in thermal-infrared light show the hexagon extends much deeper down into the atmosphere than previously expected, some 100 kilometers (60 miles) below the cloud tops. A system of clouds lies within the hexagon. The clouds appear to be whipping around the hexagon like cars on a racetrack.

"It's amazing to see such striking differences on opposite ends of Saturn's poles," said Bob Brown, team leader of the Cassini



visual and infrared mapping spectrometer, University of Arizona, Tucson. "At the south pole we have what appears to be a hurricane with a giant eye, and at the north pole of Saturn we have this geometric feature, which is completely different."

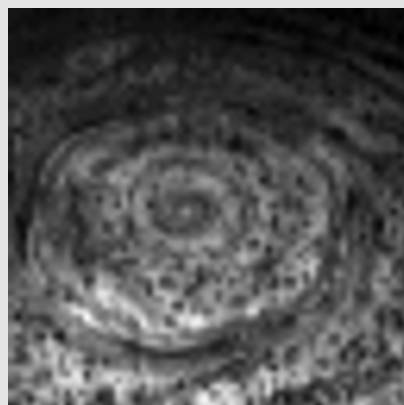


Image left: *This nighttime movie of the depths of the north pole of Saturn reveals a dynamic, active planet lurking underneath the ubiquitous cover of upper-level hazes.* Image credit: NASA/JPL/University of Arizona

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The Saturn north pole hexagon has not been visible to Cassini's visual cameras, because it's winter in that area, so the hexagon is under the cover of the long polar night, which lasts about 15 years. The infrared mapping spectrometer can image Saturn in both daytime and nighttime conditions and see deep inside. It imaged the feature with thermal wavelengths near 5 microns (seven times the wavelength visible to the human eye) during a 12-day period beginning on Oct. 30, 2006. As winter wanes over the next two years, the feature may become visible to the visual cameras.

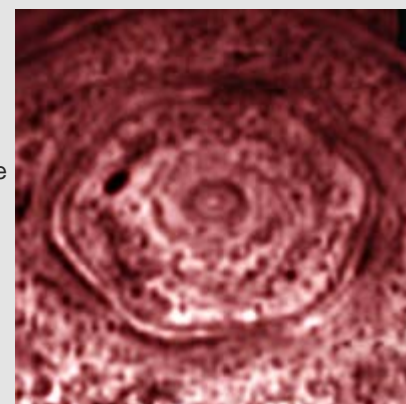
Based on the new images and more information on the depth of the feature, scientists think it is not linked to Saturn's radio emissions or to auroral activity, as once contemplated, even though Saturn's northern aurora lies nearly overhead.

Image right: *Another view of the bizarre six-sided feature encircling the north pole of Saturn.* Image credit: NASA/JPL/University of Arizona

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The hexagon appears to have remained fixed with Saturn's rotation rate and axis since first glimpsed by Voyager 26 years ago. The actual rotation rate of Saturn is still uncertain.

"Once we understand its dynamical nature, this long-lived, deep-seated polar hexagon may give us a clue to the true rotation rate of the deep atmosphere and perhaps the interior," added Baines.



The hexagon images and movie, including the north polar auroras are available at: <http://www.nasa.gov/cassini> and <http://saturn.jpl.nasa.gov> and <http://wwwvims.lpl.arizona.edu>.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington. The Cassini orbiter was designed, developed and assembled at JPL. The Visual and Infrared Mapping Spectrometer team is based at the University of Arizona.

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2007-034

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