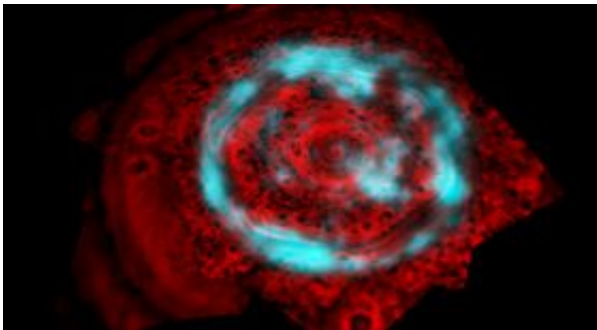


# Cassini Finds Mysterious New Aurora on Saturn

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This image of the northern polar region of Saturn shows both the aurora and underlying atmosphere, seen at two different wavelengths of infrared light as captured by NASA's Cassini spacecraft. Image: NASA/JPL/University of Arizona

(PhysOrg.com) -- Saturn has its own unique brand of aurora that lights up the polar cap, unlike any other planetary aurora known in our solar system. This odd aurora revealed itself to one of the infrared instruments on NASA's Cassini spacecraft.

"We've never seen an aurora like this elsewhere," said Tom Stallard, a scientist working with Cassini data at the University of Leicester, England. Stallard is lead author of a paper that appears in the Nov. 13 issue of the journal *Nature*. "It's not just a ring of auroras like those we've seen at Jupiter or Earth. This aurora covers an enormous area across the pole. Our current ideas on what forms Saturn's aurora predict

that this region should be empty, so finding such a bright aurora here is a fantastic surprise."

Auroras are caused by charged particles streaming along the magnetic field lines of a planet into its atmosphere. Particles from the sun cause Earth's auroras. Many, but not all, of the auroras at Jupiter and Saturn are caused by particles trapped within the magnetic environments of those planets.

Jupiter's main auroral ring, caused by interactions internal to Jupiter's magnetic environment, is constant in size. Saturn's main aurora, which is caused by the solar wind, changes size dramatically as the wind varies. The newly observed aurora at Saturn, however, doesn't fit into either category.

"Saturn's unique auroral features are telling us there is something special and unforeseen about this planet's magnetosphere and the way it interacts with the solar wind and the planet's atmosphere," said Nick Achilleos, Cassini scientist on the Cassini magnetometer team at the University College London. "Trying to explain its origin will no doubt lead us to physics which uniquely operates in the environment of Saturn."

The new infrared aurora appears in a region hidden from NASA's Hubble Space Telescope, which has provided views of Saturn's ultraviolet aurora. Cassini observed it when the spacecraft flew near Saturn's polar region. In infrared light, the aurora sometimes fills the region from around 82 degrees north all the way over the pole. This new aurora is also constantly changing, even disappearing within a 45 minute-period.

Provided by NASA

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