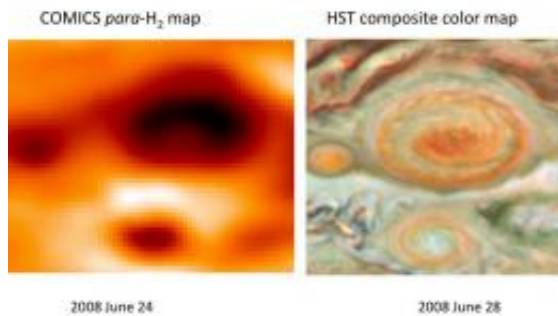


# A Fresh Look at Jupiter's Great Red Spot

April 2 2010

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LEFT: Distribution of para-H<sub>2</sub> in Jupiter from mid-infrared wavelengths. Data taken by COMICS at Subaru Telescope. (2008 June 24) This neutral component is a tracer of the vigorous upwelling taking place in the centre of each of these giant anticyclones. Dark regions show strong upwelling motions, light regions are subsiding. RIGHT: HST composite color map of visible light. (2008 June 28)

(PhysOrg.com) -- New, ground-breaking thermal images obtained with powerful ground-based telescopes show swirls of warmer air and cooler regions never seen before within Jupiter's Great Red Spot.

The thermal images were obtained by the COMICS (Cooled Mid-Infrared Camera and Spectrometer) instrument attached to the National Observatory of Japan's [Subaru Telescope](#) in Hawaii, the VISIR (Very Large Telescope Imager and Spectrometer for the mid-InfraRed) instrument at ESO's (European Southern Observatory) Very Large Telescope in Chile and the TReCS (Thermal-Region Camera

Spectrograph) instrument at the Gemini South telescope in Chile.

The images have provided an unprecedented level of resolution and extended the coverage provided by NASA's Galileo spacecraft in the late 1990s. Together with observations of the deep cloud structure by the 3-meter NASA Infrared Telescope Facility in Hawaii, the level of thermal detail observed from these giant telescope is, for the first time, comparable to visible-light images from the NASA/ESA [Hubble Space Telescope](#).

COMICS is probably the only instrument available that can capture images at such long wavelengths, thus allowing observations of para-H<sub>2</sub>, a specific condition of [molecular hydrogen](#). Maps of the para-H<sub>2</sub> ratio across the Great Red Spot were obtained at nearly the same resolution as the visible-light images. This important component of the study provided an indirect map of the strength of vertical winds and verified the prevailing upwelling of winds in the spot with downwelling components at its periphery and a downwelling component in the lower center.

These images will enable scientists to make the first detailed interior weather map of this giant storm system and link the temperature, winds, pressure and composition of Jupiter's Great Red Spot with its color.

Provided by Subaru Telescope

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