

"Long before it's in the papers"

[RETURN TO THE WORLD SCIENCE HOME PAGE](#)

---

## Giant storm grips Saturn as scientists get unprecedented view

May 19, 2011  
Courtesy of the European Southern Observatory  
and World Science staff

European and American astronomers have teamed up to study a rare storm on Saturn in more detail than ever before possible.

The ringed planet's gaseous surface normally looks placid. But once every 30 Earth years or so—one Saturn year—as spring washes over its northern half, something stirs deep below the clouds, scientists say, leading to a great planet-wide disturbance.

There's now "a gigantic, violent and complex eruption of bright cloud material, which has spread to encircle the entire planet," said Leigh Fletcher of the University of Oxford, U.K., lead author of a study on the events to appear May 19 in the research journal *Science*.



Thermal infrared images of Saturn from the Very Large Telescope (center and right) and an amateur visible-light image (left) from Trevor Barry (Broken Hill, Australia) obtained on Jan. 19 during the mature phase of the northern storm. The second image is taken at a wavelength that reveals the structures in Saturn's lower atmosphere, showing the churning storm

clouds and the central cooler vortex. The third image is sensitive to much higher altitudes in Saturn's normally peaceful stratosphere and shows "beacons" of infrared emission flanking the central cool region over the storm. (Credit: ESO/Oxford U./L. N. Fletcher/T. Barry)

---

**An instrument on NASA's Cassini spacecraft, orbiting the giant planet, first detected the storm last December. Astronomers analyzed it in further detail with an infrared camera on the European Southern Observatory's Very Large Telescope at Cerro Paranal, Chile. Amateur astronomers have also joined the hunt. Only the sixth such storm spotted since 1876, it's also the first to be observed by an orbiting craft and to be studied in the thermal infrared light, which reveals temperature variations in the storm.**

**Previous studies "have only been able to use reflected sunlight, but now, by observing thermal infrared light for the first time, we can reveal hidden regions of the atmosphere and measure the really substantial changes in temperatures and winds," Fletcher said.**

**The storm may have originated deep down in the water clouds where a thunderstorm-like process triggered a huge "convective plume," scientists say: just as hot air rises above a heater, a mass of gas would have headed up and punched through Saturn's usually calm upper atmosphere. The huge disturbances interact with the circulating winds moving east and west and cause wild temperature swings high up in the skies.**

**"Our new observations show that the storm had a major effect on the atmosphere, transporting energy and material over great distances, modifying the atmospheric winds — creating meandering jet streams and forming giant vortices — and disrupting Saturn's slow seasonal evolution," adds Glenn Orton of the Jet Propulsion Laboratory in Pasadena, Calif., another of the researchers.**

**Some unexpected features seen through the Very Large Telescope have been dubbed "stratospheric beacons"—warm spots in the stratosphere, 250 to 300 km (155 to 190 miles) above lower atmosphere cloud tops, that show how far upward the storm's effects extend. Saturn's stratosphere is normally around minus 130 degrees Celsius (minus 200 Fahrenheit) at this season but the beacons are measured to be 15-20 degrees Celsius warmer.**

**That means that though they're invisible in to the unaided eye, they can outshine the rest of the planet in the thermal infrared light, astronomers say. They had never been detected before, so researchers aren't sure how common they are. "We are continuing to observe this once-in-a-generation event," Fletcher said.**