

Possible New Moon Forming Around Saturn

NASA's Cassini spacecraft has documented the formation of a small icy object within the rings of Saturn. Informally named "Peggy," the object may be a new moon. Details of the observations were published online today by the journal *Icarus*. "We have not seen anything like this before," said Carl Murray of Queen Mary University of London, and the report's lead author. "We may be looking at the act of birth, where this object is just leaving the rings and heading off to be a moon in its own right."

This disturbance visible at the outer edge of Saturn's A ring in this image from NASA's Cassini spacecraft could be caused by an object replaying the birth process of icy moons. More Images taken with Cassini's narrow angle camera on April 15, 2013 show disturbances at the very edge of Saturn's A ring -- the outermost of the planet's large, bright rings. One of these disturbances is an arc about 20 percent brighter than its surroundings, 1,200 kilometres long and 10 kilometres wide. Scientists also found unusual protuberances in the usually smooth profile at the ring's edge. Scientists believe the arc and protuberances are caused by the gravitational effects of a nearby object.

This image is a portion of an observation recorded by the narrow-angle camera of Cassini's imaging science subsystem. This view looks toward the illuminated side of the rings from about 53 degrees above the plane of the rings. It was obtained from a distance of approximately 775,000 miles from Saturn, with a sun-Saturn-spacecraft, or phase, angle of 31 degrees. The scale is about 4 miles per pixel.

The object is not expected to grow any larger, and may even be falling apart. **But the process of its formation and outward movement aids in our understanding of how Saturn's icy moons, including the cloud-wrapped *Titan* and ocean-holding *Enceladus*, may have formed in more massive rings long ago. It also provides insight into how Earth and other planets in our solar system may have formed and migrated away from our star, the sun.**

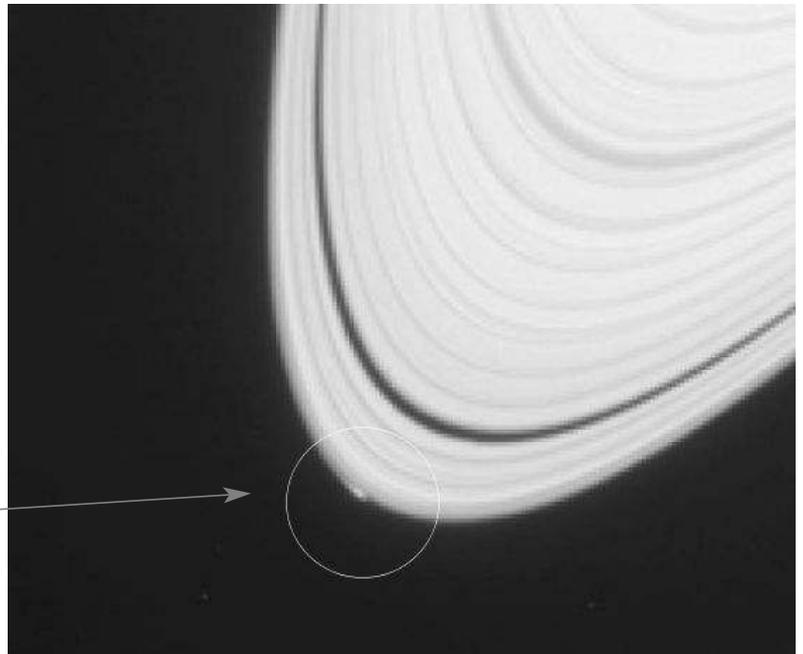
"Witnessing the possible birth of a tiny moon is an exciting, unexpected event," said Cassini Project Scientist Linda Spilker, of NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif. According to Spilker, Cassini's orbit will move closer to the outer edge of the A ring in late 2016 and provide an opportunity to study Peggy in more detail and perhaps even image it.

Peggy is too small to see in images so far. Scientists estimate it is probably no more than about a half mile in diameter. Saturn's icy moons range in size depending on their proximity to the planet -- the farther from the planet, the larger. And many of Saturn's moons are comprised primarily of ice, as are the particles that form Saturn's rings. Based on these facts, and other indicators, researchers recently proposed that the icy moons formed from ring particles and then moved outward, away from the planet, merging with other moons on the way.

"The theory holds that Saturn long ago had a much more massive ring system capable of giving birth to larger moons," Murray said. "As the moons formed near the edge, they depleted the rings."

It is possible the process of moon formation in Saturn's rings has ended with Peggy, as Saturn's rings now are, in all likelihood, too depleted to make more moons. Because they may not observe this process again, Murray and his colleagues are wringing from the observations all they can learn.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. NASA's Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the mission for NASA's Science Mission Directorate, Washington. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging operations center is based at the Space Science Institute in Boulder, Colorado.



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