



Global Friendship Through Space Education

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# ASTRO

## The Partner School Science Program Newsletter

### The Dragon Returns from Low-Earth Orbit



The first commercial spacecraft to return from a low-Earth orbit splashed into the Pacific Ocean on Wednesday about 500 miles off the coast of Southern California. The Dragon, a craft developed by the company SpaceX, was concluding a brief but historic flight for the commercial space travel industry.

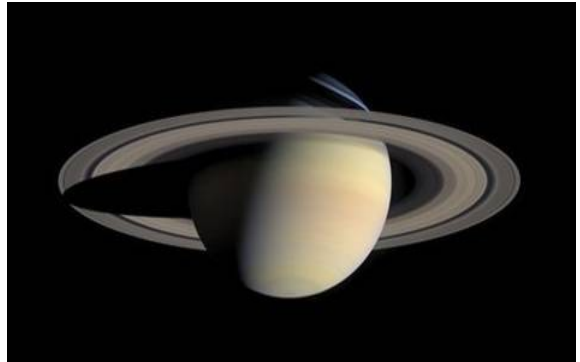
Before splashing down, the Dragon orbited Earth at more than 17,000 mph. Wednesday's landing was the first flight under NASA's Commercial Orbital Transportation Services program. The program aims to develop commercial supply services to the international space station.

NASA Administrator Charles Bolden said the mission reflected a new generation of commercial launch systems that would support the international space station and that could eventually carry astronauts into orbit. The mission coincides with the scaling back of some publicly-funded space programs. NASA, which has been flying shuttles in low-Earth orbit for nearly 30 years and going to and from the space station for more than a decade, is set to retire its shuttle fleet in 2011.

NASA has selected SpaceX and another company, Orbital Sciences, to each develop an orbital vehicle that could be used when the United States no longer has its own way to get to the space station. In the meantime, the United States will be renting space from the Russians aboard their Soyuz spacecraft. According to SpaceX CEO Elon Musk, SpaceX will be ready to begin flying cargo to the space station next year.

## Saturn's Rings the Result of Cosmic Recycling

One of the solar system's most evocative mysteries — the origin of Saturn's rings — may be a case of cosmic recycling, new research suggests.



The victim: an unnamed moon of Saturn that disappeared about 4.5 billion years ago. The suspect: a disk of hydrogen gas that once surrounded Saturn when its dozens of moons were forming, but has now fled the scene. The moon's cause of death: a forced plunge into Saturn. And those spectacular and colorful rings are the only evidence left. As the doomed moon made its death spiral, Saturn robbed its outer layer of ice, which then formed rings, according to a new theory. "Saturn was an accomplice, and that produced the rings," said study author Robin Canup.

One of the leading theories has been that either some of Saturn's many moons crashed into each other, or an asteroid crashed into some of them, leaving debris that formed the rings. The trouble is that Saturn's moons are half ice and half rock, and the planet's seven rings are now as much as 95 percent ice and probably used to be all ice. If the rings were formed by a moon-on-moon crash or an asteroid-on-moon crash, there would be more rocks in the rings. According to Canup, something had to have stripped away the outer ice of a big moon.

So her theory starts billions of years ago when the planets' moons were forming. A large disk of hydrogen gas circled Saturn, and that helped both create and destroy moons. Large inner moons probably made regular plunges into the planet, pulled by the disk of gas.

These death spirals took about 10,000 years, and the key to understanding the rings' origins is what happened to them during that time. According to Canup's computer model, Saturn stripped the ice away from a huge moon while it was far enough from the planet that the ice would be trapped in a ring.

The original rings were 10 to 100 times larger than they are now, but over time the ice in the outer rings has united to become some of Saturn's tiny inner moons. So what began as moons has become rings and then new moons. The rings and ice-rich inner moons are the last surviving remnants of this lost moon.

"I would call it cosmic recycling," said Larry Esposito, who discovered one of Saturn's rings. "Because the moon became rings which then became moons, it's not so much a final demise, but a cosmic effort to reuse materials again and again."

## IMAGE OF THE DAY - The Greatest Stars

The small open star cluster Pismis 24 lies in the core of the NGC 6357 nebula in Scorpius, about 8,000 light-years away from Earth. The brightest object in the center of this image is designated Pismis 24-1 and was once thought to weigh as much as 200 to 300 solar masses. This would not only have made it by far the most massive known star in the galaxy, but would have put it considerably above the currently believed upper mass limit of about 150 solar masses for individual stars.



However, Hubble Space Telescope high-resolution images of the star show that it is really two stars orbiting one another that are each estimated to be 100 solar masses.

*Image Credit: NASA, ESA, and J. Maíz Apellániz (Instituto de Astrofísica de Andalucía, Spain)*

In addition, spectroscopic observations with ground-based telescopes further reveal that one of the stars is actually a tight binary that is too compact to be resolved even by Hubble. This divides the estimated mass for Pismis 24-1 among the three stars. Although the stars are still among the heaviest known, the mass limit has not been broken due to the multiplicity of the system.

*Note: Image of The Day section's aim is to create curiosity in your mind and make you want to search about the image or topic, rather than us giving full details about the image. We are expecting you to ask yourself questions and to search for information about the image of the day to get answers and learn more.*