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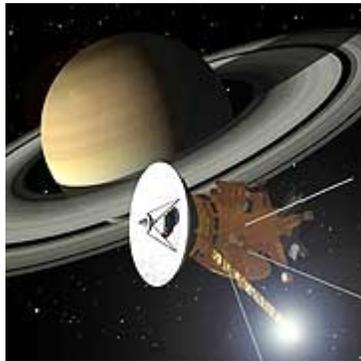
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Cassini spacecraft enters orbit around Saturn

By Dan Vergano, USA TODAY

The Cassini-Huygens spacecraft's plunge past Saturn has yielded the most detailed images yet of the planet's mysterious rings, jubilant NASA officials reported Thursday.



With a detailed look, scientists hope the mission will provide important clues about how the planets formed.

NASA via AP

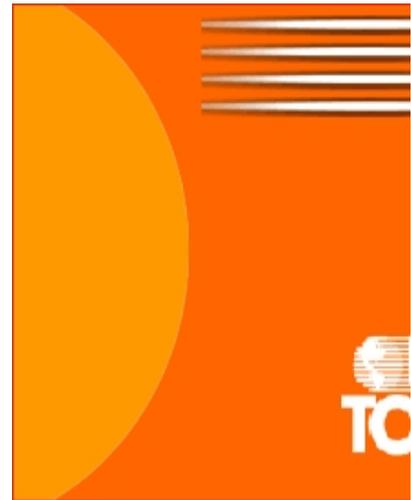
Photos resembling modern art of the dark and sunlight sides of the rings are the visual highlights of Cassini's seamless entry into orbit around the sixth planet from the sun. They were taken as the craft flew between and past the rings Wednesday night and Thursday morning,

"Citizens of Earth, I bring you the majestic rings of Saturn," NASA associate administrator Ed Weiler said at a briefing at the Jet Propulsion Laboratory in Pasadena, Calif., which manages mission operations.

Launched in 1997, Cassini is a \$3.27 billion partnership between NASA, the European Space Agency and the Italian Space Agency that will explore Saturn's rings, moons, atmosphere and magnetic field.

On its long voyage to Saturn, the spacecraft picked up "gravity assist" boosts from Venus, Earth and Jupiter,

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CASSINI REACHES SATURN
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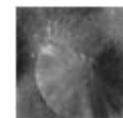
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gaining momentum as it circled those planets.

Early Thursday morning, Cassini completed its most dramatic gravity-assist maneuver, firing its main rocket engine for 95 minutes. This slowed the craft so that Saturn's gravity could force it into an orbit.

Elated mission controllers watched Cassini race through Saturn's rings at a speed of 68,700 mph. It came closer to the planet than it ever will again before passing back out through the rings and beginning its four-year orbit outside them.

"This was an unprecedented opportunity — closer to the rings than we've ever been before," said imaging team scientist Carolyn Porco of the Space Science Institute in Boulder, Colo. "Mind-blowing" pictures are already posing puzzles for scientists, she says.

For example, clumps of ice-dust particles in one of the rings "that look like straw" defy explanation, she says.

The cameras also picked up two small moons, Pan and Atlas, that haven't been spotted by astronomers for years. Both act as "shepherds," clearing gaps between the rings and shaping them through gravitational attraction.

Cassini's cameras were aimed at the rings rather than the planet because the rocket engine had to be aligned in a fixed direction during its braking burn, fixing the cameras' view as a result.



Chris Carlson, AP
Charles Elachi, Director of JPL; Ed Weiler, Associate Administrator at NASA Headquarters; Bob Mitchell, Cassini Program Manager; Julie Webster, Flight Director and Jeremy Jones, Navigation Team Chief (l-r) celebrate.

The ring images from the passage are at least five times better than those from the 1980-81 Voyager missions that flew by Saturn. Scientists also collected 75 minutes of radio-wave data from the far side of the rings, hoping to learn their composition through analysis of distorting effects.

The next big moment for Cassini comes on Christmas Eve, when it will dispatch the European Space Agency's Huygens probe to Saturn's moon, Titan. In mid-January, Huygens will parachute into the dense atmosphere of the moon, almost a planet in its own right at a size larger than Mercury and Pluto.

Titan's methane-laced nitrogen atmosphere, believed to be similar to primordial Earth more than 4 billion years ago, may provide insight into the conditions in which life arose here.

For now, Cassini's sterling performance means mission planners won't have to burn extra fuel to get the spacecraft into position to perform its science mission over the next four years — or longer.

"Prospects for an extended mission are probably pretty good," mission chief Robert Mitchell says.

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