

Cassini probe begins final stage of its mission

Previously published in *The Tartan*

Emma Flickinger | April 17, 2017

The Cassini probe has spent the last 13 years orbiting Saturn at a distance, faithfully gathering data on the planet and its moons, and transmitting it back to Earth. Now, it is entering the final stage of its mission, which it will end by plunging into Saturn itself.

NASA describes the Cassini mission, launched in 1997, as "one of the most ambitious efforts in planetary space exploration."

Much of what we know about Saturn, and almost all we know about its moons, comes from Cassini and Huygens (a smaller probe deployed by Cassini). Around Saturn, Cassini photographed and collected data from the planet's atmosphere and composition; it observed fascinating rare weather phenomena, like two storms merging and another storm wrapping its way around the planet end-to-end, and examined Saturn's rings in a level of detail never before possible. Cassini revealed fantastic features and breathtaking landscapes on Saturn's moons: geysers on Enceladus, lakes of methane on Titan, an oxygen atmosphere on Rhea. It also discovered multiple previously unknown moons.

Even after two decades in space, Cassini still has more to learn in its last months.

On Cassini's 127th and final trip past Saturn's moon Titan, it will use Titan's gravity to swing into a tighter orbit around Saturn. This closer orbit will place Cassini between Saturn and its rings, a space that has never been studied before. From this new perspective, Cassini will help scientists learn more about Saturn's gravity and magnetic field, as well as clear up some persistent mysteries (like how fast the planet rotates). It will also take the clearest photographs yet of the innermost moons.

Cassini will also explore Saturn's rings and attempt to determine their age, mass, and composition.

Like the previous stages of Cassini's journey, this final expedition promises rich new data. "It will be like a whole new mission," according to project scientist Linda Spilker.

After 22 close orbits over the next five months, Cassini will have exhausted its fuel reserves. On September 15, one month short of twenty years of service, it will hurtle directly into Saturn's atmosphere. It will collect and transmit atmospheric data until it is crushed and ultimately disintegrated by Saturn's gravity.

Planetary scientist Sarah Horst assures us that “even in its final moments, Cassini will be doing groundbreaking science.” In the final stage of its mission, Cassini will discover how the rings’ material is distributed, and how they may have formed – revelations that will in turn inform scientists about the evolution of planets in our solar system. Cassini has been one of the most successful exploration and data collection missions.