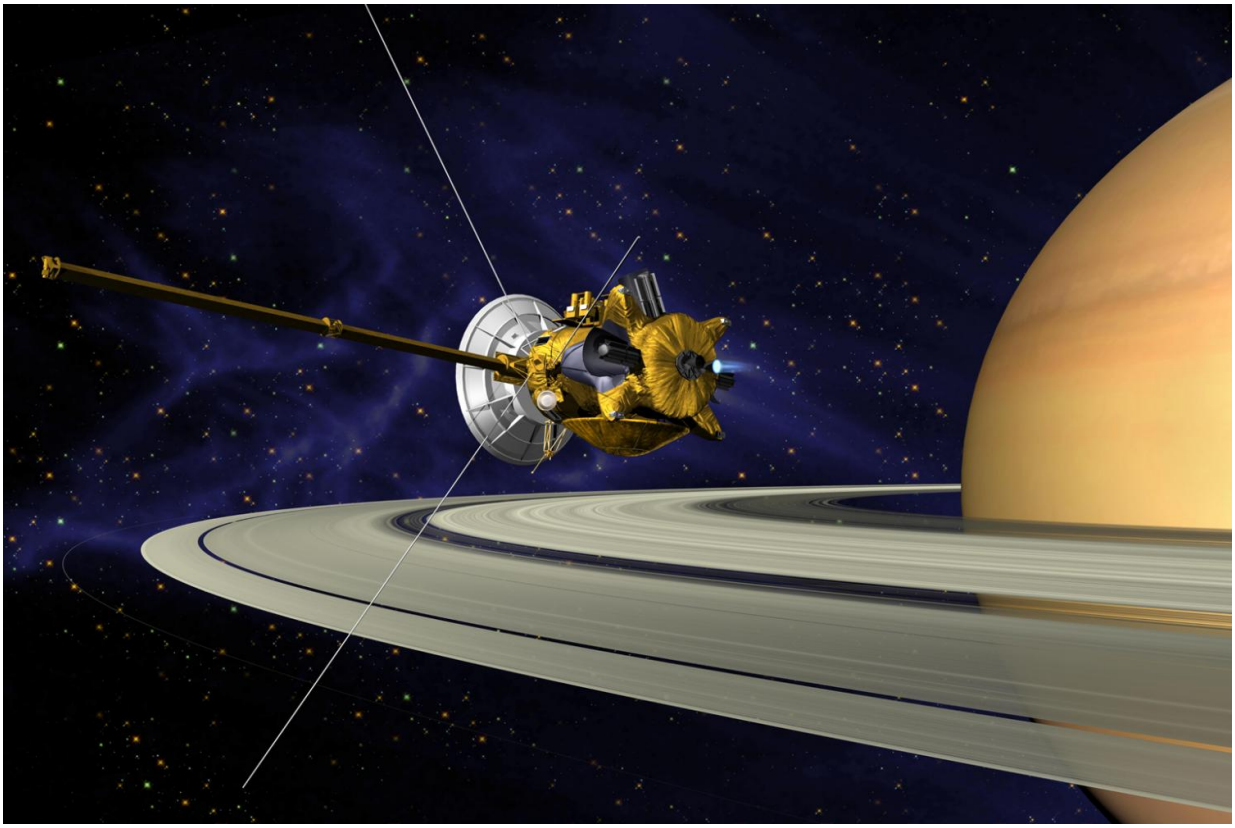
# Saturn spacecraft toting CU Boulder instrument starts swan song

April 26 2017



An illustration of the Cassini spacecraft at Saturn. Credit: NASA

Toting a $12 million instrument built by the University of Colorado Boulder, NASA's Cassini spacecraft made the first of 22 dives between the rings of Saturn and the gaseous planet today, the beginning of the

end for one of NASA's most successful missions ever.

Launched in 1997 and pulling up at Saturn in 2004 for the first of hundreds of orbits through the Jovian system, the Cassini-Huygens mission has fostered scores of dazzling discoveries. These include in-depth studies that date and even weigh the astonishing rings; the discovery of methane lakes on the icy moon Titan; hot water plumes found squirting from the moon Enceladus; and closeup views of the bright auroras at the planet's poles.

Saturn's signature rings have been charted from nearly every angle by the UltraViolet Imaging Spectrograph (UVIS), designed and built by a team at CU Boulder's Laboratory for Atmospheric and Space Physics. And while the debate on the age of the rings continues, they may have formed about the time the solar system was assembling itself some 4.6 billion years ago, said Professor Larry Esposito, principal investigator of UVIS.

"The evidence is consistent with the picture that Saturn has had rings throughout its history," said Esposito, one of the world's experts in planetary rings, who discovered Saturn's faint F ring in 1979 using data from NASA's Pioneer 11 spacecraft. "We see extensive, rapid recycling of ring material in which moons are continually shattered into ring particles, which then gather and reform moons."

Other startling discoveries led by CU Boulder with UVIS include the detection of microscopic grains of dust near Saturn, implying hydrothermal geysers are emanating from a salty ocean beneath the surface of the moon Enceladus. Subsequent UVIS measurements indicated the intensity of gas and dust jets mysteriously increases when Enceladus is farther from the ringed planet, said Esposito. This is of high interest to scientists since the subterranean Enceladus ocean may contain the ingredients for life.

The Cassini spacecraft flew past Saturn's moon Titan April 23 before its initial dive this morning between the planet and its innermost rings. Following the final ring-dive on September 15, when its fuel will be spent, the Cassini spacecraft will enter Saturn's crushing atmosphere and vaporize.

"We think there will be a lot of discoveries between now and then," said Esposito. "But September 15 will be a bittersweet ending to a mission that has fascinated us as scientists and enthralled the public with images and new findings for many years."

Cassini's UVIS instrument, a set of telescopes used to measure ultraviolet light from the Saturn system's atmospheres, rings and moons, has proven effective for many observations. UVIS has been used to study the structure and evolution of Saturn's rings; the chemistry, clouds and energy balance of Saturn and Titan; and the surfaces and atmospheres of some of Saturn's 62 known moons.

CU Boulder is the only university in the world to have designed and built instruments that have visited every planet in the solar system, including Pluto. One of LASP's hallmarks is the involvement of undergraduates and graduate students in every aspect of its space missions. LASP students currently control four NASA satellites from campus, and there are about 120 students working at LASP on different aspects of flight projects, ranging from engineering and spacecraft operations to data management and science analysis.

Provided by University of Colorado at Boulder