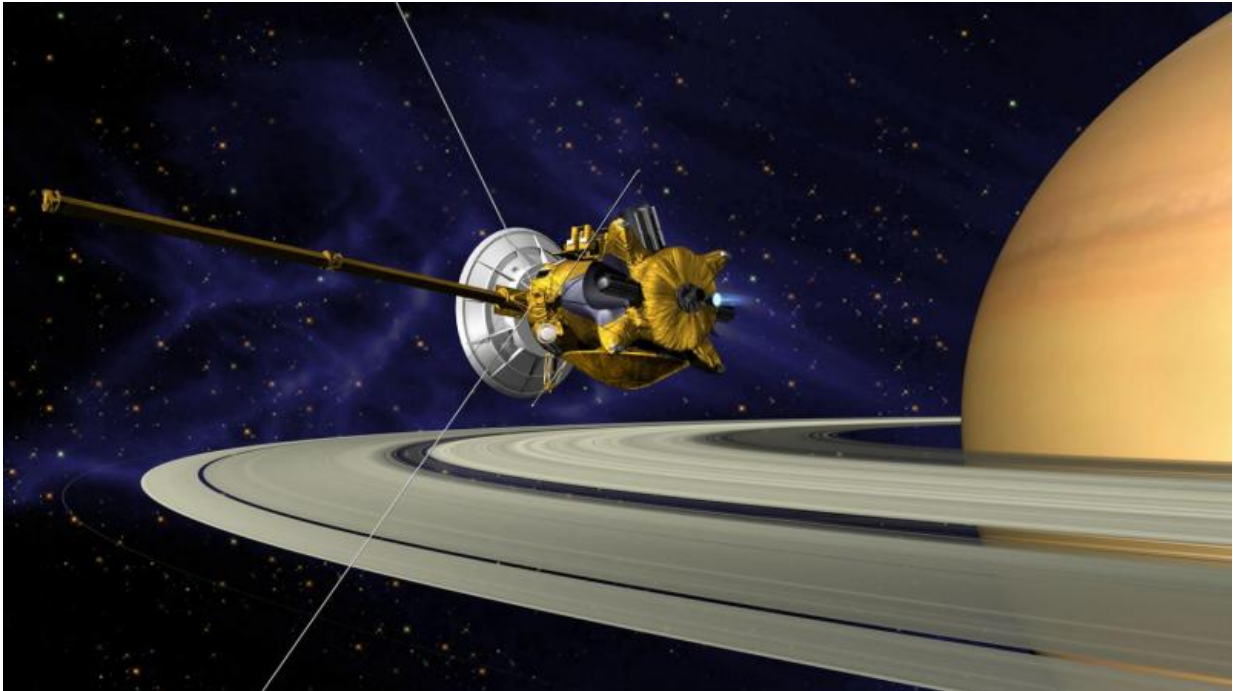


Cassini heads for 'higher ground' at Saturn

January 26 2016, by Preston Dyches



This is an artists concept of Cassini during the Saturn Orbit Insertion (SOI) maneuver, just after the main engine has begun firing. The spacecraft is moving out of the plane of the page and to the right (firing to reduce its spacecraft velocity with respect to Saturn) and has just crossed the ring plane. The SOI maneuver, which is approximately 90 minutes long, will allow Cassini to be captured by Saturn's gravity into a five-month orbit. Cassini's close proximity to the planet after the maneuver offers a unique opportunity to observe Saturn and its rings at extremely high resolution. Credit: NASA/JPL

NASA's Cassini mission is entering its next chapter with an orbital

choreography meant to tilt the spacecraft's orbit out of Saturn's ringplane.

The second of five large propulsive maneuvers in this campaign took place on Saturday, Jan. 23. Each maneuver in the series sets up a subsequent gravity-assist flyby of Saturn's massive moon Titan, which reshapes the [spacecraft](#)'s orbit, sending it to increasingly higher inclination with respect to Saturn's equator.

The 35-second engine burn began at 2:47 p.m. PST (5:47 p.m. EST) on Jan. 23, and changed Cassini's orbital speed around Saturn by about 22.3 feet per second (6.8 meters per second).

For comparison, the Feb. 1 encounter with Titan that follows this engine firing will change the velocity by 2,539 feet per second (774 meters per second).

"Titan does all the heavy lifting," said Earl Maize, Cassini project manager at NASA's Jet Propulsion Laboratory, Pasadena, California. "Our job is to get the spacecraft to a precise altitude and latitude above Titan, at a particular time, and these large propulsive maneuvers are what keep us on target to do that."

Cassini will not return again to an orbit near the plane of the rings. Engineers are slowly increasing the tilt of the spacecraft's orbit with respect to Saturn's equator to set up the mission's final, dramatic year. By late November, the spacecraft will be on a path that will carry it high above Saturn's poles, approaching just outside the planet's main rings—a period the mission team calls the "F-ring orbits." After 20 F-ring orbits, Cassini will begin its Grand Finale event, in which the spacecraft will pass 22 times between the innermost rings and the planet before plunging into Saturn's atmosphere to end its journey on Sept. 15, 2017.

Cassini has been in an equatorial orbit around Saturn since spring 2015, when it began its final campaign of close encounters with the planet's large, icy moons. These flybys included the mission's last close brushes with Hyperion, Dione and Enceladus.

The mission began its current push toward higher inclinations with a burn on Dec. 30 that changed the spacecraft's speed by 9.8 feet per second (3 meters per second) in preparation for a Titan flyby on Jan. 15. Another large main engine maneuver, designed to result in a velocity change of 26.08 feet per second (7.95 meters per second), is planned for March 25, and sets up a Titan flyby on April 4.

"We have an exciting year of Saturn science planned as we head for higher ground. And the views along the way should be spectacular," said Linda Spilker, Cassini project scientist at JPL.

Provided by NASA

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