



National Aeronautics and
Space Administration
Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California

Cassini-Huygens Spacecraft





On October 15, 1997, the Cassini–Huygens spacecraft was launched on an almost 7-year journey to the Saturn system. On its way, Cassini–Huygens passes Venus (twice), Earth, and Jupiter — arriving at the Saturn system on July 1, 2004. On arrival, the Huygens probe will be released from the Cassini orbiter and will descend to the surface of Saturn’s largest moon, Titan, on November 27, 2004. During the Huygens probe mission, data about Titan’s atmosphere, winds, and surface conditions will be collected. These data will be sent back to Earth using the Cassini orbiter’s high-gain antenna as a relay. The Cassini orbiter will orbit Saturn for 4 years. The spacecraft’s 12 onboard instruments will collect data about Saturn, the rings, the magnetosphere, Titan, and Saturn’s smaller moons.

The Cassini–Huygens mission is managed for the National Aeronautics and Space Administration (NASA) by the Jet Propulsion Laboratory (JPL) of the California Institute of Technology. The European Space Agency, the Italian Space Agency (Agenzia Spaziale Italiana), and many European and American academic and industrial partners have teamed with NASA to make the Cassini–Huygens mission a reality.

The Cassini orbiter stands 2 stories tall; at launch, it weighed 5,300 kilograms (11,594 pounds). Over half of the orbiter’s mass is propellant. The Huygens probe, built by ESA, is 2.7 meters (8.86 feet) in diameter and weighs approximately 350 kilograms (766 pounds).

Details About the Spacecraft

The Cassini–Huygens spacecraft stands 6.8 meters (22.3 feet) tall and has a dry mass (no propellant in the tanks) of 2,523 kilograms (5,520 pounds), including the Huygens probe. When liquid propellant is added, the spacecraft’s total mass becomes 5,574 kilograms (12,263 pounds). The main body of the Cassini–Huygens spacecraft consists of a “stack” of spacecraft electronics, propulsion equipment, science instruments, and the large high-gain antenna (HGA). The HGA measures 4 meters (13.1 feet) in diameter. A large engine capable of producing 440 newtons (100 pounds) of force is mounted on the opposite end of the spacecraft from the HGA. The Huygens probe is mounted on one side of the spacecraft. The spacecraft carries 12 science instruments and the probe carries 6 science instruments.

A long boom carrying the magnetometer instrument extends 11 meters (36 feet) from the body of the spacecraft. This boom is necessary because the magnetometer instrument is very sensitive to magnetic fields. In order to minimize the effect of magnetic fields generated by the spacecraft, the magnetometer is placed on this long boom. At launch, this boom was stored in a canister on the side of the spacecraft, but prior to Cassini–Huygens’ swingby of Earth in August 1999, the canister was opened and the boom extended by spring action — much like a “jack in the box,” which holds a clown that pops out of the box on a spring when the lid is opened.

EDUCATIONAL ACTIVITY

Build a Model of the Cassini–Huygens Spacecraft

One of the best ways to learn about a complex machine like Cassini–Huygens is to build a model and study its different parts. A Cassini spacecraft engineer has designed two different paper models of Cassini–Huygens: one is for experienced model builders, and the other is for those who’d like a model that’s easy to assemble. Both models are available on the Cassini website at <http://www.jpl.nasa.gov/cassini>, where all you have to do is click on the section marked “Products” and scroll down to the section on the models. You may also obtain a model by sending your request to:

Cassini Outreach Team
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