

The Cassini/Huygens Mission to Saturn

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The Cassini/Huygens mission is an international cooperative effort between NASA, the European Space Agency, and the Italian Space Agency to conduct a scientific investigation of the Saturnian system. The spacecraft, which was launched in October of 1997, will use a Venus-Venus-Earth-Jupiter gravity assisted trajectory to arrive at Saturn in July of 2004. The spacecraft, composed of an orbiter and an atmospheric entry probe, will be placed in orbit about Saturn, after which the Huygens probe will be released to enter the atmosphere of Titan, the largest moon of Saturn. The probe data is transmitted during its descent and possible survival on the surface to the orbiter overhead, where it is stored and later relayed to Earth. The orbiter then continues in a four-year mission about Saturn, conducting detailed studies of the atmosphere, the rings, the magnetosphere, Titan, and the icy satellites. The probe carries six instruments to explore the atmosphere and surface of Titan; the orbiter carries twelve instruments for its investigations.

This paper characterizes the performance of the Cassini/Huygens spacecraft during its first year and three-quarters of flight, up through the second of the two Venus flybys. The flight system, including the 18 scientific instruments, is described, as well as the detailed overall objectives of the mission.