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## THE ITALIAN CONTRIBUTION TO THE ONE-OF-A-KIND CASSINI-HUYGENS MISSION

**Abstract**

On the early morning of October 15th 1997, from the Cape Canaveral launch complex was launched the AtlasIV-Centaur vector that placed the more than seven tons of the Cassini-Huygens spacecraft into the trajectory designed to reach Saturn. Realized by the Partnership of NASA, ESA and ASI it has been so far one of the most successful deep space missions ever and one of the most prominent example of international cooperation in space. This cooperative environment allowed both ESA and ASI to enter at best in the environment of the deep-space planetary missions and also provided the opportunity for other 15 nations of contributing to the mission. The final approval itself of the Cassini-Huygens mission was possible thanks to the international partnership. Within this framework, at that time the just founded Agenzia Spaziale Italiana supported the proposal of Italian scientists and started the technical discussions with NASA that were completed with the signature of a Memorandum of Understanding, this was also possible thanks to the excellent relationship between NASA and ASI, based on the fruitful partnership in previous programs since the S. Marco project in the '60s. At that time, ASI could rely on an already mature Italian space industry with high technical skills and also very motivated in starting a new activity that promised to push for innovation, despite the possible occurrence of some industrial risks. The Cassini-Huygens mission has characterized the Solar System exploration scenario for more than 30 years. During its mission Cassini has revealed an incredible number of unexpected characteristics of Saturn, its rings and some of its satellites, over all Titan, providing also pictures of an astonishing beauty. On September 15th when Cassini finally plunged into the upper atmosphere of the gas giant planet transmitting by the High Gain Antenna unprecedented data till burning up like a meteor and ending its epic mission to the Saturn system. Many of these results have been achieved thanks to the Italian contribution to some key experiment and all the mission data have been delivered to Earth thanks to the Italian HGA. Cassini-Huygens legacy is an enormous amount of scientific data of high quality including astonishing images of Saturn and its moons. The importance of this legacy has to be extended also to the industrial side in fact new technologies and procedures have been developed and adopted by many other missions later.