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Huygens Highlights and lessons learned

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Ten years ago, on 14 January 2005, the Huygens Probe parachuted down to the surface of Titan, Saturn's largest moon. Huygens is part of the international Cassini/Huygens mission, a joint endeavor of NASA, the European Space Agency, and Agenzia Spaziale Italiana. Cassini/Huygens, comprising the NASA-provided Saturn Orbiter and the ESA-provided Huygens probe, was launched in October 1997. It arrived at Saturn in early July 2004. Huygens was released on the 3rd orbit around Saturn. It made measurements during the hypersonic entry, the descent, and for more than one hour on the surface. Unique in situ characterization of the atmosphere along the entry and descent trajectory and of the surface at the landing site was provided, revealing that many Earth-like processes were at work on Titan, a very fascinating methane world. Huygens observations also allowed inferring the ice crust thickness, hence an estimation of the depth of the icy crust/liquid water ocean interface. Huygens measurements are also used as ground-truth of the measurements made by the orbiter during Titan flybys. In this presentation, after a brief review of the major mission milestones, Huygens achievements are discussed in the context of the progress made in our understanding of Titan during the Cassini/Huygens mission. Lessons learned for the future in situ exploration of Titan are addressed.

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