

Future Titan Missions

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New discoveries about Titan from the Cassini-Huygens mission have led to a broad range of mission class studies for future missions, ranging from NASA Discovery class to International Flagship class. Three consistent science themes emerge and serve as a framework for discussing the various mission concepts: Goal A: Explore Titan, an Earth-Like System – How does Titan function as a system? How are the similarities and differences with Earth, and other solar system bodies, a result of the interplay of the geology, hydrology, meteorology, and aeronomy present in the Titan system?; Goal B: Examine Titan's Organic Inventory—A Path to Prebiological Molecules – What is the complexity of Titan's organic chemistry in the atmosphere, within its lakes, on its surface, and in its putative subsurface water ocean and how does this inventory differ from known abiotic organic material in meteorites and therefore contribute to our understanding of the origin of life in the Solar System?; and Goal C: Explore Enceladus and Saturn's magnetosphere—clues to Titan's origin and evolution – What is the exchange of energy and material with the Saturn magnetosphere and solar wind? What is the source of geysers on Enceladus? Does complex chemistry occur in the geyser source?

Within this scientific framework the presentation will overview the Titan Explorer, Titan AND Enceladus Mission, Titan Saturn System Mission, Titan Mare Explorer, and Titan Submersible. Future timelines and plans will be discussed.