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P33A-2129: Explorer of Enceladus and Titan (E²T): Investigating Ocean Worlds' Evolution and Habitability in the Saturn System

Wednesday, 14 December 2016

13:40 - 18:00

📍 *Moscone South - Poster Hall*

The NASA-ESA-ASI Cassini-Huygens mission has revealed Titan and Enceladus to be two of the most enigmatic worlds in the Solar System. Titan, with its organically rich and dynamic atmosphere and geology, and Enceladus, with its active plume of water vapor and ice including trace amounts of organics, salts, and silica nano-particles, both harboring subsurface oceans, are prime environments to investigate the conditions for the emergence of life and the habitability potential of ocean worlds, as well as the origin and evolution of complex planetary systems. The Explorer of Enceladus and Titan (E²T) is a space mission concept dedicated to investigating the evolution and habitability of these Saturnian satellites and is proposed in response to ESA's M5 Cosmic Vision Call, as a medium-class mission led by ESA in collaboration with NASA. E²T has a focused state-of-the-art payload that will provide in-situ chemical analysis, and high-resolution imaging from multiple flybys of Enceladus and Titan using a solar-electric powered spacecraft in orbit around Saturn. With significant improvements in mass range and resolution, as compared with Cassini instrumentation, the Ion and Neutral Gas Mass Spectrometer (INMS) and the Enceladus Icy Jet Analyzer (ENIJA) time-of-flight mass spectrometers will provide the data needed to decipher the subtle details of the aqueous environment of Enceladus from plume sampling and of the complex pre-biotic chemistry occurring in Titan's atmosphere. The Titan Imaging and Geology, Enceladus Reconnaissance (TIGER) mid-wave infrared camera will map thermal emission from Enceladus' tiger stripes at meter scales and investigate Titan's geology and compositional variability at decameter scales.

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