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Future Mission to Titan and Enceladus

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Abstract

In the 50 years since space exploration began, a mission such as the Titan Saturn System Mission (TSSM) concept studied in 2008 [1, 2] would be the first in situ exploration of active organic chemistry and climate on the land, on the sea, and in the air of another world. TSSM was studied as a collaborative NASA-ESA mission that would include a full complement of NASA and ESA exploration elements. Orbiter, lander and montgolfière flight elements would deploy highly capable complementary instruments in orbit, in atmospheric flight and on a large sea, and investigate the plumes and subsurface of Enceladus in ways that Cassini cannot. The same instruments that would provide orbital global coverage of Titan would be used to gain exceptional insights into the chemistry and internal evolution of Enceladus during seven targeted close flybys that promise to answer many of the most intriguing questions raised by Cassini. Furthermore, a mission like TSSM would make measurements that shed light on how Saturn's magnetosphere exchanges mass and energy with Titan and in particular feeds ions from other moons, such as Enceladus, into Titan's atmosphere.

This poster will present one of many possible mission concepts and related readiness efforts needed achieve a future comprehensive focused exploration of Titan and Enceladus.

References

[1] TSSM Final Report, 3 November 2008, NASA Task Order NMO710851

[2] TSSM NASA/ESA Joint Summary Report, 15 November 2008, NASA Task Order NMO710851