BOSTON UNIVERSITY

SPACE PHYSICS SEMINAR

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Sailing the Seas of Titan, Saturn's Earth-Like Moon

Thursday, September 19, 2013
725 Commonwealth Ave.
Refreshments at 3:30pm in CAS 500
Talk begins at 4:00pm in CAS 502

Abstract:
Oceanography is no longer just an Earth Science. The ongoing NASA/ESA Cassini mission - still making exciting discoveries 10 years after its arrival in the rich Saturnian system - has found that three seas of liquid hydrocarbons adorn Saturn's giant, frigid moon Titan. Titan was already exotic, having a thick, organic-rich atmosphere, and a diverse landscape with mountains, craters, river channels and vast fields of sand dunes, but these seas, and hundreds of lakes, present a new environment (low gravity, dense atmosphere, hydrocarbon liquid) in which to explore familiar and important physical processes such as air:sea heat and moisture exchange, wind-driven currents and waves, etc. Moreover, Titan's seas (notably the two largest ones, Kraken Mare and Ligiea Mare, about 1000km and 400km across, respectively) offer an appealing and accessible target for future Titan exploration.

This talk will review the latest findings from Cassini, and its prospects for new discoveries as we move towards Titan's northern summer solstice in 2017, and the opportunities for future exploration which might include (as at Mars) orbiters and landers, but also vehicles that can exploit Titan's environment such as balloons or airplanes. The most affordable near-term prospect for in-situ exploration is a capsule to float in the seas of Titan, where after splashdown it would drift in the winds to make a traverse across the sea, measuring the liquid composition and turbidity, studying conditions with cameras and meteorological instruments, and exploring the seabed with a depth sounder.