

Titan's Surface Environment : A Target for Astrobiological Exploration

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Titan's surface is being revealed in detail by the NASA/ESA Cassini-Huygens mission, and early results point to a young surface, with evidence of possible fluid flow and cryovolcanic activity. Titan's organic photochemistry yields abundant hydrocarbons and nitriles – these may react with liquid water in cryovolcanic flows to yield amino acids, purines and other important prebiotic molecules. Thus Titan is a more appealing astrobiological target than Europa, which lacks abundant organics. Furthermore, Titan's thick atmosphere makes it easy to deliver instrumentation to its surface, perhaps in a mobile aerial platform such as an airship or helicopter, able to traverse long ranges across Titan's diverse landscape and select specific spots for sampling and prebiotic assay.

Recent developments in Titan mission and instrumentation concepts will be discussed in the light of early results from Cassini-Huygens.