

Astrobiology News July 2019: NASA's Dragonfly to Explore Titan

Having purchased a drone for my spouse's birthday this month, NASA's recent announcement about an astrobiology mission selected to explore Saturn's moon, Titan, caught my eye.¹ Scheduled to launch from Earth in 2026 and arrive at Titan in 2034, the Dragonfly lander has eight rotors and flies like a large drone. It will investigate multiple sites around this unique world, seeking out prebiotic environments and searching for chemical evidence of past or extant life.

Larger than the planet Mercury, Titan is the only moon in the Solar System with a dense atmosphere – 4 times denser than Earth's, with a surface atmospheric pressure 50% higher than Earth's. Dragonfly will maneuver through Titan's thick atmosphere and low gravity, becoming the first vehicle flying its entire science payload to examine surface materials at many interesting regions on another world.

Titan is the only world besides Earth in the Solar System with flowing liquid on its surface. Not only does Titan have lakes and rivers of methane and ethane, it has clouds, methane rain, and other organics that form in Titan's nitrogen-based atmosphere and fall like light snow. With its wide variety of organic compounds, Titan may offer important clues about the origin of life itself. The moon's weather and surface processes combine these complex organics, energy, and water similar to processes that may have sparked life on Earth.

Dragonfly is taking advantage of 13 years of data from the Cassini mission² to choose when and where to land on Titan, as well as interesting scientific targets to visit. Its planned tour will include dozens of locations, including the "Shangri-La" dune fields, which Dragonfly will explore in a series of flights up to about 5 miles, and the Selk impact crater, where there is evidence of past liquid water. Over the course of its 2.7-year baseline mission, the drone will fly more than 108 miles – nearly double the distance traveled to date by all the Mars rovers combined!

Dragonfly is part of NASA's New Frontiers program, which supports missions that have been identified as top Solar System exploration priorities by the planetary community.

Until next month,

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¹ <https://astrobiology.nasa.gov/news/nasa-announces-astrobiology-mission-to-titan/>, also <https://www.nasa.gov/press-release/nasas-dragonfly-will-fly-around-titan-looking-for-origins-signs-of-life>

² <https://solarsystem.nasa.gov/missions/cassini/overview/>