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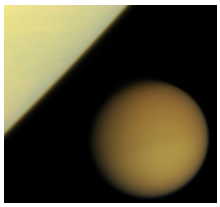

Cassini's natural color view of Titan approaching Saturn
JPL / NASA

Saturn's Titan Moon Is Electric

Electric storms may enable the existence of organic molecules

The Huygens probe, currently in the orbit of Saturn's largest moon, Titan, has managed to send back enough data for specialists to work with. Although not everything went as expected, upon a thorough analysis, they were able to infer that the atmosphere of Titan shows signs of natural electric activity. As proven by previous experiments, electricity is the spark of life, transforming inorganic compounds into organic, prebiotic molecules, which could pave the way for life to emerge at some point. The atmosphere on Saturn's moon was discovered in 1908 by the Spanish astronomer Jose Comas y Sola, which makes it "a unique world in the solar system," according to physicist Juan Antonio Morente from University of Granada's Department of Applied Physics.

"In this moon, there are clouds with convective movements and therefore there can be static electric fields and stormy conditions. It significantly increases the chance that organic and prebiotic molecules get formed, according to the theory of Russian biochemist Alexander I. Oparin and Stanley L. Miller's experiment," (responsible for obtaining organic compounds out of inorganic molecules by means of electric shocks) explains the scientist. "Therefore, Titan has been one of the main objectives of the Cassini-Huygens combined mission of the NASA and the European Space Agency (ESA)," adds Morente. The atmospheric electricity is measured by determining the "Schumann resonances" (a series of peaks in the extremely low frequency - ELF - part of the cosmic body's electromagnetic field spectrum) caused by the conductivity of the ionosphere. The electric field was analyzed by Huygens probe's MIP instrument (sensor of mutual impedance). "In a stable descent, without rolling, the MIP sensor would have been able to measure the peak tangential component of the electric field, but unfortunately a strong wind made the probe to roll and the electrodes measured a superposition of such tangential and radial component," shares Morente. Still, the researchers were able to come up with a way to unveil the Shumann resonances on Titan by separating the "early" and "late-time" temporary signals from the MIP, which proves beyond doubt the existence of atmospheric electricity. Future measurements of the moon's surface will provide more clues on the chemical activities that resulted from this electric weather.