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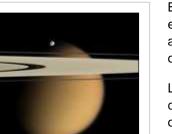
# **Electricity Found on Saturn Moon--Could** It Spark Life?

Rebecca Carroll for National Geographic News October 28, 2008

PHOTOS VIDEO

Recently identified electrical activity on Saturn's largest moon bolsters arguments that Titan is the kind of place that could harbor life.

At a brisk -350 degrees Fahrenheit (-180 Celsius), Titan is currently much too cold to host anything close to life as we know it, scientists say.



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But a new study reports faint signs of a natural electric field in Titan's thick cloud cover that are similar to the energy radiated by lightning on Earth.

Lightning is thought to have sparked the chemical reactions that led to the origin of life on our planet.

"As of now, lightning activity has not been observed in Titan's atmosphere," said lead author Juan Antonio Morente of the University of Granada in Spain.

But, he said, the signals that have been detected "are an irrefutable proof for the existence of electric activity."

# Frozen, Prebiotic Casserole

Morente's team studied data returned from the European Space Agency's Huygens probe, which broke away from NASA's Cassini spacecraft in 2005 to become the first probe to go below Titan's clouds. (Read "Voyage to Saturn" in National Geographic magazine.)

As soon as the probe entered the moon's atmosphere, a strong wind tilted the device about 30 degrees.

This accidental motion enabled Huygens to detect the Earthlike electrical resonances that it otherwise would have missed, which Morente and colleagues describe their study, published in a recent issue of the journal Icarus.

Jeffrey Bada, of the Scripps Institution of Oceanography, believes the process that allowed lightning to spark life on Earth is universal and could happen in many environments—including on Titan.

Confirmation earlier this year of Titan's hydrocarbon lakes makes the Saturnian moon the first place other than Earth where open bodies of liquid have been found.

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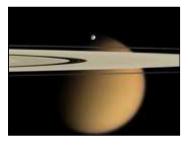
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# **Electricity Found on Saturn Moon--Could** It Spark Life?

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Hydrocarbons are organic molecules, and the fact that they exist in large quantities on Titan suggests that life could take root there under the right conditions.

"If you had lightning taking place in the atmosphere of Titan, you could make what we call precursor molecules," said Bada, who was not involved with Morente's study.



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"To go any further than that," he said, "you need liquid water."

Titan's water is currently frozen into chunks as hard as granite. If those ice "rocks" were to melt, however, the environment could become more hospitable to the building blocks of life.

With liquid water, the planet could host the formation of amino acids and then full proteins, which drive all biochemistry and set the stage for more complex molecules.

"I look at Titan as a big, frozen, prebiotic casserole," Bada said, referring to the state before the emergence of life.

"The idea that life could be widespread in the universe, I think, is very credible."

# A Field of Its Own

Advocates of theories about life on Titan note that various celestial events could temporarily warm up the moon enough to melt its ice into water.

Perhaps this happened in the past, they say or it could happen in the future.

But study author Morente said it's impossible to precisely assess such possibilities with the

scientific knowledge available today.

What astronomers do know is that Titan does not have its own magnetic field, he said. The moon instead orbits within Saturn's magnetosphere at differing distances from the planet.

This means that the strength of Titan's magnetic field is constantly changing, leaving its surface more vulnerable to damaging cosmic rays.

Without stable protection from radiation, Morente said, "the existence of life is very unlikely."

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