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Scientists Discover Amino Acid Essential for Life in Interstellar Space

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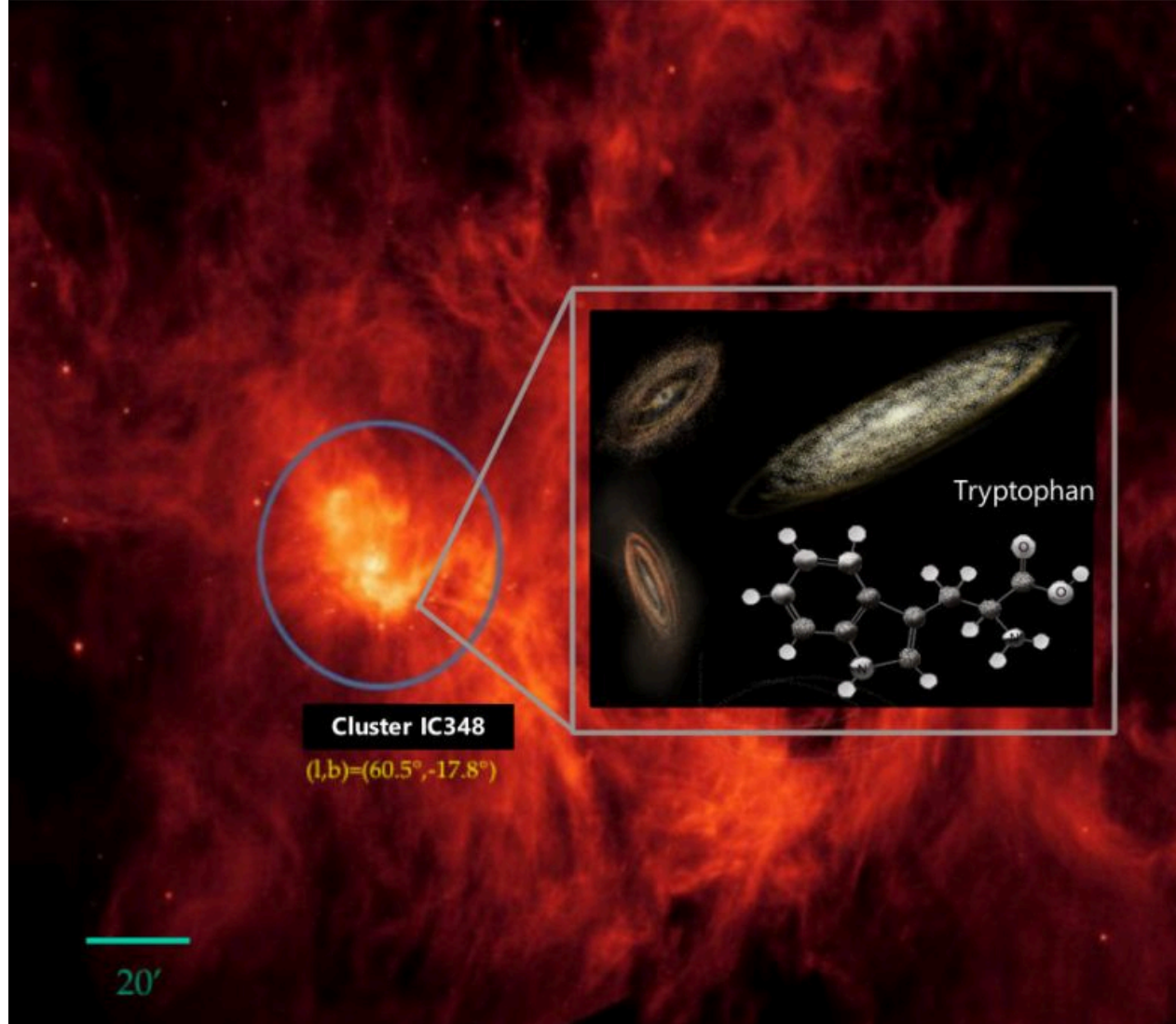
Researchers discovered evidence of the amino acid tryptophan in the interstellar material of the IC348 star system using data from the Spitzer Space Observatory. This finding suggests that protein-building amino acids are prevalent in areas where stars and planets develop, hinting at the potential for life in exoplanetary systems.

The discovery of tryptophan in a distant star-forming region hints that amino acids, crucial for life, may be widespread in space.

Dr. Susana Iglesias-Groth from The Instituto de Astrofísica de Canarias (IAC) has used Spitzer space observatory data to uncover signs of the amino acid tryptophan in the interstellar material in a nearby star-forming region. The research was recently published in the journal *Monthly Notices of the Royal Astronomical Society*.

High amounts of tryptophan were detected in the Perseus Molecular Complex, specifically in the IC348 star system, a star-forming region that lies 1000 light years away from Earth — relatively close in astronomical terms. The region is generally invisible to the naked eye, but shines brightly when viewed in infrared wavelengths.

Tryptophan is one of the 20 amino acids essential for the formation of key proteins for life on Earth and produces one of the richest patterns of spectral lines in the infrared. It was therefore an obvious candidate to be explored using the extensive spectroscopic database of the Spitzer satellite, a space-based infrared telescope.



Tryptophan has been detected in space. Credit: Jorge Rebolo-Iglesias. Background image: NASA/Spitzer Space Telescope

The analysis of the infrared light emitted from the region revealed 20 emission lines of the molecule tryptophan. The temperature of the tryptophan is about 280 Kelvin, or 7 degrees Celsius. Iglesias-Groth has previously found water and hydrogen at the same temperatures in IC348.

The study suggests that the emission lines associated with tryptophan may also be present in other star-forming regions and that their presence is common in the gas and dust from which stars and planets form.

Amino acids are commonly found in meteorites and were present during the formation of our Solar System. This new work could indicate that these protein-building agents — that are key to the development of life — exist naturally in the regions where stars and planetary systems form, and may contribute to the early chemistry of planetary systems around other stars.

Dr. Iglesias-Groth says, “The evidence for tryptophan in the Perseus molecular complex should encourage additional effort to identify other amino acids in this region and in other star-forming regions. It is a very exciting possibility that the building blocks of proteins are widely present in the gas from which stars and planets form — it may be key for the development of life in exoplanetary systems.”

Reference: “A search for tryptophan in the gas of the IC 348 star cluster of the Perseus molecular cloud” by Susana Iglesias-Groth, 22 May 2023, *Monthly Notices of the Royal Astronomical Society*.

DOI: [10.1093/mnras/stad1535](https://doi.org/10.1093/mnras/stad1535)

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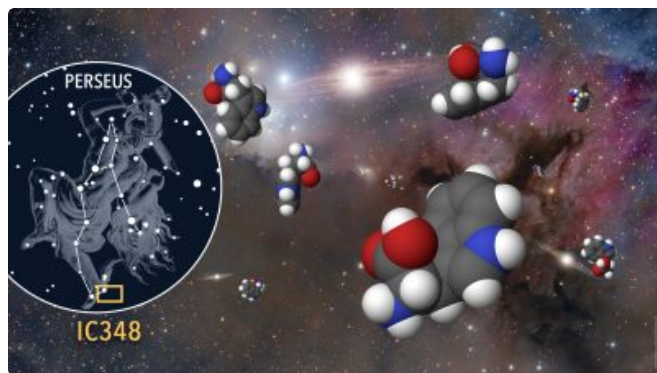
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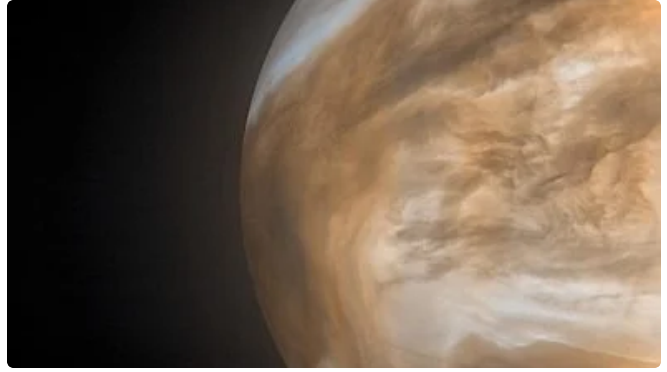
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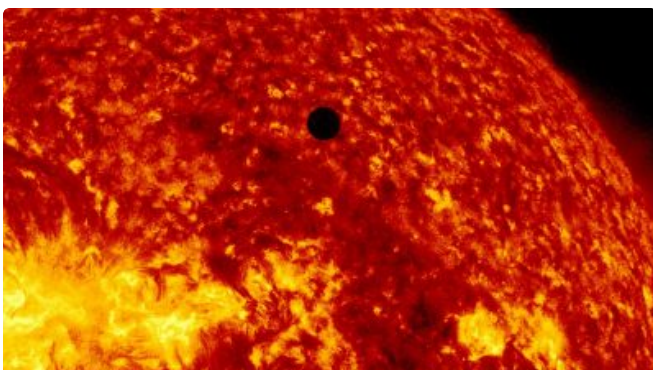
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Kevin S Maloney on September 10, 2023 7:15 pm

Does this mean that these aliens are sleeping on their lazy boy recliners after their Thanksgiving Turkey Dinner like we Earthlings do?

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Kevin S Maloney on September 10, 2023 7:17 pm

FYI. Tryptophan is the chemical in Turkey that makes us sleepy.

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dlsamg on September 11, 2023 8:40 am

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Jeanne on November 23, 2023 8:22 am

Aw, so it's Not an amino acid we could ingest to live in outer space? I was pretty excited when I read the headline. Happy Tryptophan Day, everyone! 🍷

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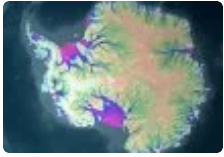
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