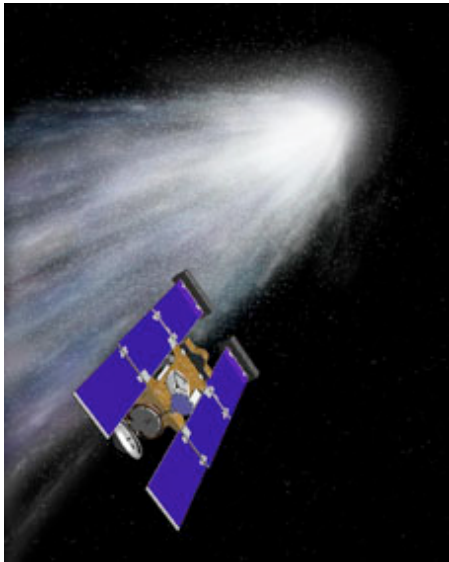


Building block of life reported found in comet

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Courtesy NASA
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Scientists have reported finding a fundamental building block of life in samples of comet Wild 2 brought to Earth by NASA's Stardust spacecraft.

The chemical, glycine, “is an amino acid used by living organisms to make proteins, and this is the first time an amino acid has been found in a comet,” said Jamie Elsila of NASA’s Goddard Space Flight Center in Greenbelt, Md. “Our discovery supports the theory that some of life’s ingredients formed in space and were delivered to Earth long ago by meteorite and comet impacts.”



Artist's concept of the Stardust spacecraft beginning its flight through gas and dust around comet Wild 2. The white area represents the comet. The collection grid is the tennis-racket-shaped object extending out from the back of the spacecraft. (Credit: NASA/JPL)

Elsila is the lead author of a paper on this research accepted for publication in the journal *Meteoritic and Planetary Science*. The research was also presented at an American Chemical Society meeting in Washington, D.C. on Aug. 16.

The discovery “supports the idea that the fundamental building blocks of life are prevalent in space, and... that life in the universe may be common,” added Carl Pilcher, Director of the NASA Astrobiology Institute which co-funded the research.

Proteins are the workhorse molecules of life, used in everything from structures like hair to enzymes, the catalysts that speed up or regulate chemical reactions. Just as the 26 letters of the alphabet are arranged in limitless combinations to make words, life uses 20 different amino acids in a huge variety of arrangements to build millions of different proteins.

Stardust passed through dense gas and dust surrounding the icy core of Wild 2 (pronounced “Vilt-2”) on Jan. 2, 2004. As the spacecraft flew through this material, a special collection grid filled with aerogel – a sponge-like material that’s more than 99 percent empty space – gently captured samples of the comet’s gas and dust.

The grid was stowed in a capsule which detached from the spacecraft and parachuted to Earth two years later. Since then, scientists around the world have been busy analyzing the samples to learn the secrets of comet formation and our solar system's history.

"We actually analyzed aluminum foil from the sides of tiny chambers that hold the aerogel in the collection grid," said Elsila. "As gas molecules passed through the aerogel, some stuck to the foil. We spent two years testing and developing our equipment to make it accurate and sensitive enough to analyze such incredibly tiny samples."

"The discovery of amino acids in the returned comet sample is very exciting and profound," said Stardust Principal Investigator Professor Donald E. Brownlee of the University of Washington, Seattle, Wash. "It is also a remarkable triumph that highlights the advancing capabilities of laboratory studies of primitive extraterrestrial materials."