

ASTRONOMY

Studies of Pluto and stardust seek insight to questions of life on Earth

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Last month, the New Horizons spacecraft was launched from Cape Canaveral, and a spacecraft dubbed Stardust plummeted back to Earth. New Horizons was sent on a 10-year mission to explore Pluto, the cold and remote planet near the edge of the solar system. Stardust, with its sophisticated butterfly net, captured dust blown off the back of comet Wild 2 and returned it to Earth for laboratory analysis.



Though their missions are distinct, they share the same overarching goal.

They are intended to study pristine material from the outer reaches of the solar system in search of clues to how life took root on Earth.

Like other structure in the universe, complex and diverse life-forms emerged gradually from simple beginnings over a span of 4 billion years.

One of the enduring mysteries these probes seek to answer is how earthly life got started so quickly.

The fossil record shows life flourishing 4 billion years ago, only a few hundred million years after the Earth formed. This is a long time by human standards but is astoundingly short from a cosmic perspective.

Experiments done in the 1950s showed that amino acids, the building blocks of life, can be chemically synthesized from methane, hydrogen and ammonia. These elements were abundant in the harsh environment of the ancient Earth.

Amino acids also have been found on meteorites. But it is not certain whether they were synthesized in remote space or were contaminated by earthly material.

Determining whether microbial life developed on Earth, or whether it was seeded by bombardment of cosmic debris, is an essential step toward understanding whether life exists throughout the cosmos.

Scientists hope that by analyzing Pluto's cold and hostile environment, and by studying stardust in the laboratory, the conditions and chemistry from which life on Earth sprang will be revealed.

A discovery of microbial life flourishing on a piece of stardust would be breathtaking. It would forever change our view of humanity because we then would know with certainty that life on Earth is not unique.

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