

Questions in science

Could life ever have existed on Mars?

Narrator:

Microscopic single-celled organisms like bacteria, fungi and archaea can persist in some of the most extreme environments on Earth: The high temperatures of hot springs in New Zealand, the freezing temperatures of the Canadian Arctic, the extreme pressures at the bottom of the ocean, and the desiccated salt flats of Northern India.

Microbial life is found in almost every environmental condition on Earth's surface, and if we want to know if it could have ever existed elsewhere, we need to study the life that thrives at these extremes.

One possibility for life beyond of Earth is the planet Mars. Whilst there are many similarities between Mars and Earth, including the length of its day and the presence of seasons, there are some big differences that mean it is an extremely hostile place for life.

Mars' surface experiences high levels of radiation and extremely low temperatures that would be detrimental to life as we know it.

Any life there would need to be able to cope with such extreme conditions, perhaps existing below the surface.

However, evidence suggests that about four billion years ago, Mars had liquid water on its surface and may have been a much more hospitable place.

This means that while life might struggle to survive on Mars today, it may have been able to thrive in Mars' past.

Missions to Mars haven't yet provided any evidence either way to answer the question of whether life exists or ever existed on Mars, and so the question remains unsolved.

However, as there were times in Mars' past where it may have been suitable for life, and with a stream of new discoveries, and planned return of samples to Earth, who knows what we may discover in the future?

To discover more about the search for life in the Solar System and develop your scientific thinking, explore our introductory science module Questions in Science.

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