



Where in the universe, except planet Earth, do we have indications that life exists, or could have existed?

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So far, there was no definitive evidence of extraterrestrial life. However, scientists have been exploring various celestial bodies in our solar system and beyond where conditions might be suitable for life or where signs of potential habitability exist. Some of the key targets for the search for extraterrestrial life include planets of our Solar System, their natural satellites and exoplanets.

Mars. Mars has been a major focus of astrobiology missions. Recent discoveries of liquid water beneath its surface and the detection of methane in its atmosphere have sparked interest in the possibility of microbial life (Botha et al 2018).

Europa (moon of Jupiter). Europa has a subsurface ocean beneath its icy crust. The presence of liquid water and the potential for hydrothermal vents make it an intriguing target for the search for life (Botha et al 2018).

Enceladus (moon of Saturn). Similar to Europa, Enceladus has a subsurface ocean beneath its icy shell. NASA's Cassini spacecraft detected plumes of water vapor erupting from its surface, providing an opportunity to analyze the composition of its subsurface ocean (Botha et al 2018).

Titan (moon of Saturn). Titan has lakes and rivers of liquid methane and ethane, and some scientists consider it a candidate for prebiotic chemistry (Petrescu-Mag et al 2011; Petrescu-Mag & Gavrioloaie 2018). The Cassini-Huygens mission provided valuable data about Titan's surface.

Exoplanets. Scientists have identified numerous exoplanets in the habitable zones of their host stars (Krissansen-Totton et al 2022), where conditions might allow for liquid water. Ongoing and future missions, such as the James Webb Space Telescope, aim to characterize the atmospheres of some of these exoplanets (Birkman et al 2022).

While there are intriguing findings and hypotheses, conclusive evidence of extraterrestrial life has not been found. Future missions and advancements in technology may provide more insights into the potential habitability of other celestial bodies and the existence of extraterrestrial life.

Conflict of interest. The author declares that there is no conflict of interest.

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