

Space is the final frontier it's never-ending expanse offering humanity the opportunity for endless exploration and discovery. Yet in spite of the size of this cosmic frontier there are few signs of life that we have observed in our Solar System, Galaxy, or Universe. Mars, our rocky neighbor and the fourth planet from the Sun, is one of the few locations humans have identified that may be or may have been hospitable to life. Just as important, from our human centric viewpoint, Mars is also one of the few planets suitable for exploration.

Mars is promising for several reasons.

Mars has a rocky solid structure. It is actually possible to step foot on the planet's surface and not be crushed by the pressure seen on gas giants such as Jupiter. Mars, relatively speaking, lacks an extreme environment and in addition possesses the building blocks of life such as Carbon, Nitrogen and H₂O (Sharp 2017). The "temperate" climate of Mars stands in contrast to Mercury and Venus who, though close to Earth, possess hell like climates unsuitable for exploration. Mars is also incredibly close to Earth, in galactic terms, being some 34.8 million miles away from Earth at its closest point (Redd NT. 2017). It is this proximity which makes it possible, given current scientific/technological constraints, to send robotic and human expeditions to Mars.

Though Mars as stated above has some foundational components necessary for life there are also signs that life on Mars will be extraordinarily difficult to find. It is a comatose planet meaning it has no active plate tectonics and lacks a robust magnetic field as seen on Earth. In addition the low levels of oxygen, virtually non-existent liquid water, and a thin atmosphere makes the Martian surface a barren freezing desert.

And yet hope remains.

The Curiosity Rover, the largest and most sophisticated rover that has been sent to Mars, has detected potential signs of life previously undiscovered.

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Pound for pound what a human can accomplish on a planet as novel as Mars is more advanced than what a rover can, yet it must be stated that I am not advocating for the disuse of rovers.

Instead the over reliance on rovers must be brought to an end; true progress in the search for life on Mars will come about through a synthesis of human and robotic capabilities. Though anecdotal according to a NASA survey of planetary scientists and engineers the vast majority favored human capabilities over robots “ with the implicit recognition that the most efficient exploration strategies of all will be those consisting of human-robotic partnerships where each complements the other” (Crawford IA. 2012).

By tasking future expeditions, composed of humans and rovers, with a primary objective of exploring Mount Sharp we will be able to conclusively prove that it is possible for life to exist outside Earth. Though the life found on Mars may be microscopically small it would signal a giant leap in our understanding of life throughout the Solar System and beyond.