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Earth to Billionaires: Finding Life Is Space's Final Frontier

Evidence is growing for extraterrestrial life in our solar system, and exploration is cheap.

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Are you a billionaire looking to improve the world while immortalizing your name? Are you secretly envious that Richard Branson and Jeff Bezos might make spaceflight routine, or that Elon Musk might put humans on Mars? Look no further for your claim to eternal fame and glory. You have the chance to own humanity's next big space feat: proving the existence of extraterrestrial life.

Astrobiology is as cool as it sounds. As evidence grows for extraterrestrial life within our own solar system, astrobiology is the biggest opportunity for entrepreneurial minds with an eye toward the skies. So for any billionaires looking to etch their names in the history books, here are some reasons why you need to be in the business of astrobiology.

We've already found the hallmarks of life in many corners of our solar system. In 2015, NASA found evidence of liquid water on Mars. Researchers caught the comet Lovejoy releasing sugar and alcohol around the solar system. In 2018, NASA's Jet Propulsion Laboratory confirmed there is water ice on the moon. In November 2019, an international team of scientists discovered meteorites carrying the organic sugar ribose, which is essential for the formation of RNA. Not counting Earth, there are at least eight liquid oceans on planets and moons orbiting the sun. To borrow from the X-Files: The truth is out there.

Scientists have also been searching for subsurface Martian life. Evidence suggests Mars was once habitable for microbial life, with the proper chemicals, tolerable temperatures, and water likely present and stable for millions of years. Gilbert Levin, an engineer who was the principal investigator for a life-detection experiment on the 1976 Viking mission to Mars, wrote in a 2019 article that he believes that experiment did indeed find evidence of microbial life. But the experiments were never repeated in later missions. Why not repeat them now?

By the way, we might not even have to land on an extraterrestrial body to discover life. It's clear that Europa and Enceladus, moons of Jupiter and Saturn, respectively, are emitting giant plumes of water into space. Enceladus

shows evidence of a subsurface liquid ocean that contains organic carbon, nitrogen and inorganic salts.

In his 2014 paper, “Follow the Plume: The Habitability of Enceladus,” NASA scientist Christopher McKay made a compelling case for a return mission to Enceladus, which would be relatively cheap and have a high chance of success: Samples “from the plume jetting out into space are accessible to a low-cost flyby mission. No other world has such well-studied indications of habitable conditions. Thus, the science goals that would motivate an Enceladus mission are more advanced than for any other Solar System body.”
There’s also no need for enormous budgets or big government subsidies. Dozens of commercial space companies are building and launching hundreds of satellites, and the cost of exploration is plummeting. Building and launching a small satellite can be as cheap as building and launching a software app.

The international Cassini mission to Saturn cost $3.26 billion, but private manufacturer Rocket Lab says it can launch small satellites at $5 million a mission. By my estimate it costs another $5 million or so to build the satellite. At $10 million total, that’s 300 small-satellite trips for the price of one Cassini mission. With that many shots at the target, the odds of success start looking pretty good.

Plus, low-cost missions are an opportunity to learn from mistakes and apply those lessons more quickly. My friend Pete Worden, former director of NASA’s Ames Research Center and chairman of the Breakthrough Prize Foundation, tells me: “In my opinion it is always better to build a little, test a little. A series of lower-cost limited missions, once every year or two, allows for much better results in the long-run. It’s a lot easier to adjust content and technology if you iterate every two years than every 20.”

The life-science industry is estimated to exceed $1.5 trillion by 2022. Imagine if the life-science industry became a solar-system life-science industry. Who knows what pharmaceutical advancements might come from studying

extraterrestrial life? Lifesaving vaccines and drugs such as quinine have been discovered in terrestrial rain forests. What might exist on other planets?

Note too how many innovations are offshoots of unrelated scientific research. GPS was originally developed to track satellites in orbit but now guides people to their morning latte. The discoveries of substances like penicillin and insulin are often referred to as accidents, but they would never have happened without some kind of purposeful scientific inquiry. Who knows what happy accidents might come out of astrobiological inquiry? Who knows how practical—or lucrative—these follow-on discoveries might be?

Finding evidence of life beyond Earth would reshape the fields of evolutionary biology and pharmacology, and possibly theology as well. Technology makes these new discoveries possible, but the work will need financial support. While your billionaire friends are trying to make the world a better place, you can invest in making a better solar system.

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