OPINION

Is an unknown space object a 'message in a bottle'?

Oumuamua, discovered in 2017 by the Pan-STARRS observatory, showed many properties allowing for the possibility that it was manufactured artificially by an alien technology.

By Avi Loeb Updated June 3, 2021, 3:00 a.m.

This handout photo released by the European Southern Observatory on November 20, 2017 shows an artist's impression of the first interstellar asteroid: Oumuamua. This unique object was discovered on October 19, 2017 by the Pan-STARRS 1 telescope in Hawaii. M. KORNMESSER/AFP/GETTY IMAGES

Are we alone in the universe? Recent findings suggest we may not be.

The Pan-STARRS observatory in Hawaii can detect reflected sunlight from objects bigger than a football field that pass within the orbit of the Earth around the sun. The first known interstellar visitor of such size was discovered by this telescope on Oct. 19, 2017, and named Oumuamua — "scout" in Hawaiian.

The object showed many anomalous properties that made it different from any natural comet or asteroid that astronomers had witnessed before in the solar system, allowing for the possibility that it was manufactured artificially by an alien technology.

Oumuamua had a flattened shape with extreme proportions — never seen before among comets or asteroids, as well as an unusual initial velocity of 196,000 miles per hour and a shiny appearance exhibiting a push away from the sun in excess of the solar gravitational force. The excess force could be explained if Oumuamua were propelled by the pressure of sunlight; that is, if it is an artificially-made lightsail — a thin relic of promising technology for space exploration that could accelerate spacecrafts by harnessing the push of light. Such technology is currently being developed by the Starshot Initiative and other organizations. This possibility would imply that Oumuamua is a message in a bottle from an unknown origin.

The many anomalies exhibited by Oumuamua forced all natural scientific interpretations of it to invoke objects that we have never seen before — all with improbable drawbacks. They include the hypothesis that it's a hydrogen iceberg — but that would likely have evaporated by absorbing starlight during its journey; a nitrogen iceberg chipped off the surface of a Pluto-like planet around other stars — but that requires much more raw material than available in the Milky Way; a "dust bunny" a hundred times more rarefied than air — but that might not have the material strength to withstand heating to hundreds of degrees by the sun; or a tidal disruption relic — which would not have the pancake-like shape inferred for Oumuamua.

The experience of finding Oumuamua is similar to walking along a beach and discovering a bottle among all the natural rocks and seashells. Even if Oumuamua is an artificially-made "bottle" — distinct from all natural rocks in the solar system — it is probably equipment that is billions of years old and out of commission. Most stars formed billions of years before the sun, and the technological relics that another civilization launched into space are probably too old to be functional. We can retrieve more information about technological relics by taking close-up photographs. Such a photo could have helped determine if Oumuamua was a natural rock or an artificial object manufactured by an extraterrestrial civilization.

Putting our hands on a piece of alien technology would change the way we perceive our place in the universe, our aspirations for space, and our philosophical and theological beliefs. Copying an extraterrestrial technology that the world does not possess could be a financial and scientific goldmine. Still, it would be a psychological shock, and we must prepare for it.

Stories about one-time miracles are the foundation of myths, but they do not stand up

to the standards of science. The situation becomes more complicated by eyewitness testimonies of one-time events. The Pentagon was ordered by Congress to disclose all it knows about Unidentified Aerial Phenomena by June 2021. And last month, "60 Minutes" reported on the federal government's acknowledgment of such UAPs. But this focus on past eyewitness reports is misguided. It would be prudent to move scientific inquiry forward with Earth's finest technology. Instead of declassifying documents that reflect decades-old technologies used by witnesses with no scientific expertise, it would be far better to deploy state-of-the-art recording devices, such as camera or audio sensors, at the sites where the reports came from, and search for unusual signals.

A scientific expedition focused on reproducing old reports would be far more valuable in unraveling the mysteries behind them. Its most important purpose would be to inject scientific rigor and credibility into the discussion of whether we are alone — or not.

Avi Loeb is former chair of the astronomy department at Harvard University, founding director of Harvard's Black Hole Initiative, and director of the Institute for Theory and Computation at the Harvard-Smithsonian Center for Astrophysics. He is the author of "Extraterrestrial: The First Sign of Intelligent Life Beyond Earth."