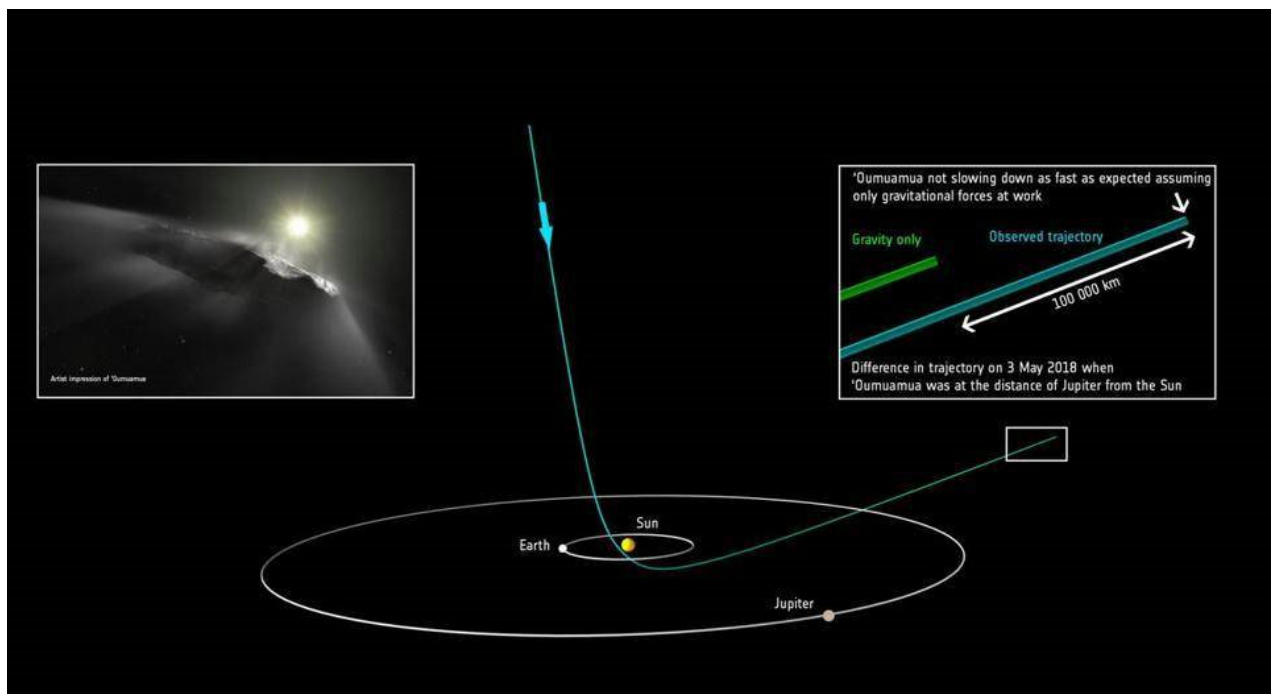




Science

Harvard researchers suggest interstellar object might have been from alien civilization



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This diagram, provided by the European Southern Observatory, shows the orbit of the interstellar object 'Oumuamua as it passes through the solar system. 'Oumuamua passed the distance of Jupiter's orbit in early May 2018 and will pass Saturn's orbit January 2019. It will reach a distance corresponding to Uranus' orbit in August 2020 and of Neptune in late June 2024. In late 2025 'Oumuamua will reach the outer edge of the Kuiper Belt, and then the heliopause — the edge of the Solar System — in November 2038.

By [Martin Finucane](#) and [Steve Annear](#)

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That strange interstellar object that invaded our solar system and passed close to Earth in the fall of 2017 could have been an artificial object, a piece of a spacecraft from an alien civilization, Harvard researchers are [suggesting in a new paper](#).

“There is data on the orbit of this object for which there is no other explanation. So we wrote this paper suggesting this explanation,” said Professor Avi Loeb, chairman of the Harvard astronomy department. “The approach I take to the subject is purely scientific and evidence-based.”

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“As far as I know, there is no other explanation,” he said. “You can rule it out or in, based on additional data.”

He said the study had been accepted for publication in the *The Astrophysical Journal Letters* on Nov. 12.

The paper, written by Loeb and postdoctoral researcher Shmuel Bialy, suggests the object might be a light sail, or solar sail — [a proposed method of powering](#)

[spacecraft](#) that uses a sail to catch radiation pressure and propel the spacecraft, just as a normal sail uses the wind to propel a boat.

The object ‘Oumuamua — Hawaiian for “messenger from afar arriving first” — is the first ever observed intruding in the orbits of our planets. It was picked up by telescopes in October 2017 at the University of Hawaii’s Haleakalā Observatory, the National Aeronautics and Space Administration said. It is [on its way out of the solar system](#) and expected to never return. Scientists say other “interstellar” objects may have sailed by in the past, undetected.

The object raised eyebrows. It was monitored for signs of radio signals as weak as one-tenth of a cellphone-strength signal, but nothing was detected.

Researchers [said in December 2017](#) that it appeared to be a naturally formed, icy object covered with a dry crust.

Loeb said the object is “peculiar” for a variety of reasons. One reason is that it has deviated from an orbit dictated by the sun’s gravity. It had “excess acceleration,” he said. Comets can have such acceleration because ice on them vaporizes when heated by the Sun, propelling them. But ‘Oumuamua had no tail like a comet.

“The question arises as to what is causing the excess acceleration, the excess kick it has, and the possibility we suggest is the radiation from the sun which is pushing it,” he said.

The way the object moves, Loeb said, is consistent with a light sail a fraction of a millimeter in thickness that is tens of meters across.

If “radiation pressure” is pushing the object, then ‘Oumuamua “represents a new class of thin interstellar material, either produced naturally or artificially,” the paper says.

If it is artificial, “one possibility is that ‘Oumuamua is a lightsail, floating in interstellar space as a debris from an advanced technological equipment,” the paper says.

“Alternatively, a more exotic scenario is that ‘Oumuamua may be a fully operational probe sent intentionally to Earth vicinity by an alien civilization,” the paper even suggests.

Loeb said he’s gotten some strong reactions, with the strongest ones coming from people who haven’t read the paper, which he said “illustrates how much prejudice there is about this subject.”

“I don’t see this any differently from a subject that’s right in the mainstream that everyone is working on. It’s exactly the same approach,” he said.

He said that with the object hurtling out of the solar system, it’s not possible to study it anymore, but scientists on Earth should be alert for the next one.

“If we see another one, we can look carefully,” he said.

He noted that no photograph was ever taken of ‘Oumuamua. “We don’t have an image because we were not prepared. ... The importance of finding this object is that now we can make plans for the future and look more.”

Andrew Siemion, director of the Berkeley SETI Research Center, said in an e-mail that the paper was “very intriguing. ... Observational anomalies like we see with Oumuamua, combined with careful reasoning, is exactly the method

through which we make new discoveries in astrophysics — including, perhaps, truly incredible ones like intelligent life beyond the Earth.”

Siemion is the principal investigator for Breakthrough Listen, a program of astronomical observations looking for life beyond Earth.

Loeb works on another Breakthrough initiative, Breakthrough Starshot, which is working on sending small “nanocraft” light-years into space at incredibly high speeds — powered by light sails pushed by Earth-based laser beams.

Globe correspondent Ben Thompson contributed to this report.

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