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PARANORMAL ACTIVITY

Why is Harvard University astrophysicist Avi Loeb working with ardent UFO believers?

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In 1957, a “flying saucer” was photographed near an Air Force base in New Mexico. BETTMANN/CONTRIBUTOR/GETTY IMAGES

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Abraham “Avi” Loeb got the idea to hunt for aliens from cable TV. In June 2021, Loeb, an astrophysicist at Harvard University, was at home, watching NASA Administrator Bill Nelson on CNN talking about recent UFO incidents involving U.S. Navy pilots. “Do you think we have been contacted by extraterrestrials?” the CNN interviewer asked. Nelson hedged, then said he was “turning to our scientists” to find out what the pilots saw.

UFOs were big news at the time. Outlets from *The New York Times* to *60 Minutes* had run stories on shadowy objects that appear to dart and dance in grainy video clips taken by Navy jet pilots. On 25 June, shortly after Nelson mused about the footage on CNN, the Pentagon issued a report on nearly 2 decades' worth of the "unidentified aerial phenomena" (UAP)—the government's preferred new term for UFOs. It said the objects were likely to be drones, weather-related phenomena, or artifacts of sensor glitches. On the other hand, it said that, in some cases, the objects "appeared to exhibit unusual flight characteristics." Meanwhile, a Pew Research Center poll that month found that half of Americans believed aliens were steering the UFOs.

Loeb, already obsessed with a mysterious interstellar object that whizzed through the Solar System in 2017, sensed an opportunity. Immediately after seeing Nelson on CNN, he emailed NASA science chief Thomas Zurbuchen to propose a government-funded UFO study. Later that day, the two spoke over the phone, and Loeb says Zurbuchen was "supportive" of the idea. But Loeb never heard back after that. He quickly pivoted to private funding. His first lucky strike came when Eugene Jhong, a Silicon Valley entrepreneur and Harvard alum who had heard Loeb talking about aliens on a podcast, offered up \$1 million, no strings attached.

In July, Loeb unveiled the Galileo Project, which he says was designed in the spirit of the revolutionary Italian astronomer Galileo Galilei. (The tagline is "Daring to look through new telescopes.") The overarching goal of the \$1.8 million project is to search for evidence of extraterrestrial technology, and one branch is traditional: analyzing possible interstellar objects spotted deep in space by mountaintop observatories. More controversial is the construction of a network of rooftop cameras designed to capture any UFOs prowling through Earth's atmosphere. After enlisting more than three dozen astronomers and engineers in the project—as well as some notorious nonscientists—Loeb hopes to solve the enduring UFO mystery once and for all. "Scientists have to come to the rescue and clear up the fog," Loeb says.

Some researchers applaud Loeb's endeavor. "He has mounted a scientific attack on a problem that is frustratingly fuzzy," says Gregory Laughlin, an astrophysicist at Yale University. "A project like this would have been unthinkable 10 years ago." But others say Loeb is tarnishing astronomy and undermining the search for extraterrestrial intelligence (SETI) [just as that effort has started to acquire a veneer of respectability](#). In particular, they are bothered by the outspoken UFO zealots with no science background whom Loeb has welcomed into the project. "He's intermingled legitimate scientists with these fringe people," says Caleb Scharf, an astrobiologist at Columbia University. "I think you lose far more by doing that."

RAISED ON HIS FAMILY'S FARM in Israel, Loeb has demonstrated a lifelong precociousness, as well as a restless and relentless curiosity. After earning a Ph.D. in plasma physics at the Hebrew University of Jerusalem in 1986 at the age of 24, he worked on a project funded by then-President Ronald Reagan's "Star Wars" missile defense program. While still in his 20s, Loeb rubbed elbows with the luminary physicist Freeman Dyson at the Institute for Advanced Study, where he switched to theoretical astrophysics, before joining Harvard in 1993. There, he pursued a traditional academic path—until several years ago when he became known as the Harvard professor who talks about aliens.

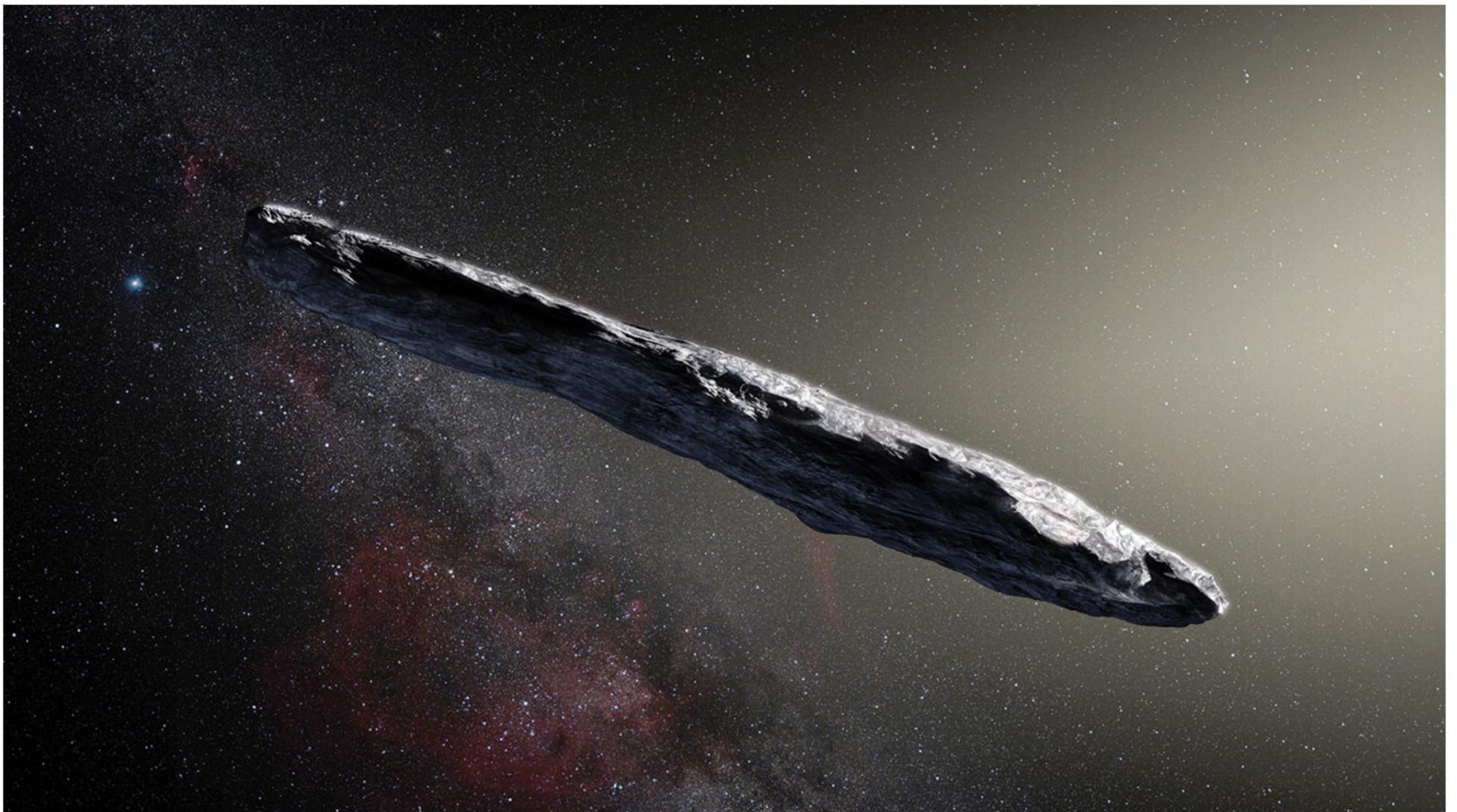


Avi Loeb wants to gather data on modern UFOs. HERLINDE KOELBL

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Loeb considers himself a trendsetter, and maintains a list of his “top 20 confirmed predictions.” Those include theories about how to use gravitational lenses to detect planets; how stars can feed the Milky Way’s central, giant black hole when they stray too close; and what the base of the jet of material that rockets out from the black hole at the center of the M87 galaxy looks like—a prediction confirmed when the black hole’s shadow was captured by the Event Horizon Telescope in 2019. “I worked on imaging black holes before it became fashionable,” he says with matter-of-fact boastfulness. “I worked on the first stars in the universe before it became popular.” He points to that research as an impetus for the James Webb Space Telescope, the just-launched observatory that will probe the early universe.

None of this was controversial or drew a public spotlight. But then, in 2017, a telescope in Hawaii spotted a cigar-shaped rock 400 meters long passing through the Solar System, its immense speed and bizarre trajectory firmly placing it in the category of “not from around here.” ‘Oumuamua, as it ended up being called, was the first documented interstellar object to visit the Solar System, and Loeb leaped at the chance to study something so strange. He noted, as other scientists did, that ‘Oumuamua was brighter than a typical comet—too bright to be natural, he believed. He couldn’t shake the thought: What if it was an alien spaceship? Loeb ended up publishing 20 papers on ‘Oumuamua, and in early 2021, a book on it titled *Extraterrestrial: The First Sign of Intelligent Life Beyond Earth*.



An artist's conception of 'Oumuamua, an interstellar object that passed through the Solar System. Avi Loeb muses that it could be an alien spaceship. ESO/M. KORNMESSER

Loeb's theory that 'Oumuamua was some kind of technological debris from an otherworldly civilization drew worldwide attention. He became an eager spokesperson, appearing not just in mainstream media outlets, but also UFO podcasts and conferences. But most of Loeb's colleagues rejected his hypothesis, which he first laid out in a 2018 paper published in *The Astrophysical Journal Letters*. Others mocked it or dismissed it as a publicity stunt. “What’s really irritating is that Avi is a smart guy,” says Karen Meech, a planetary astronomer at the University of Hawaii, Manoa. “He is a good scientist. But he is out for fame here.” The snubs gnawed at Loeb.

His anger boiled over early last year at an online forum called the Golden Webinar in Astrophysics, where he portrayed himself as the victim of a “close-minded” scientific community unwilling to entertain bold hypotheses. “If we listen to my colleagues we would just forget about [‘Oumuamua],” he said. “We would not put any funds for cameras taking photographs of it. Then we will maintain our ignorance, just like the philosophers in Galileo’s age.”

It was peculiar reasoning, not least because workers at the time were putting the finishing touches on the Vera C. Rubin Observatory, an 8-meter behemoth taking shape in Chile—and designed specifically to look for transient phenomena like ‘Oumuamua when it opens sometime next year. And in 2019, the European Space Agency approved Comet Interceptor, a mission that after launch in 2029 will park itself beyond Earth’s orbit in a position to chase down and inspect fast moving comets—or even interstellar objects.

One pioneering SETI researcher at the forum could not abide Loeb’s comments. “Some of us have been thinking about and building instruments to find anomalies for a very long time,” Jill Tarter reminded Loeb during one testy exchange at the forum. (Tarter was the inspiration for the astronomer played by Jodi Foster in the 1997 movie *Contact*.) Tarter said it was important not to make any conjectural leaps about aliens unless there was “extraordinary evidence.” This, she added, was the only way of “differentiating ourselves from the pseudoscience that is so much a part of popular culture with UFOs.”

IN JULY 2021, WHEN LOEB unveiled the Galileo Project, it appeared to be aiming for just this sort of extraordinary evidence. He had recruited a team of scientists from prominent institutions worldwide to design and work on the project. “I was attracted to it because it is data-driven,” says Kevin Heng, an astrophysicist at the University of Bern.

One part of the project would design software to screen the data coming from telescopes like the Rubin observatory for interstellar objects. But the core of the project would be a worldwide network of sky monitors, hundreds in all. Each dome-shaped unit, roughly the size of an umbrella, will contain infrared and optical cameras arranged like a fly’s eye to capture the full expanse of sky overhead. Audio sensors and radio antennas will listen at other frequencies. Running 24 hours a day, the monitors are meant to record everything that moves through the sky, day and night: from birds and balloons to insects, airliners, and drones. Artificial intelligence (AI) algorithms, trained to discard known objects like birds in favor of fast-moving spherical and lens-shaped objects, will sift through the data, says Richard Cloete, a computer scientist at the University of Cambridge, who is overseeing the system’s software. “We’re basically filtering out all the things that we expect to find in the sky,” he says. “And all these things that are labeled other [by the AI] will be of interest.”

Seth Shostak, an astronomer at the SETI Institute who sits on the Galileo Project’s advisory board, points out that networks of sky cameras are not new. Since 2010, one SETI Institute network has detected 2 million meteors, and in the past few years, the LaserSETI project has begun to watch the sky for pulses of light from alien technologies. What’s novel about the Galileo Project, Shostak says, is its focus on hunting for aliens in Earth’s atmosphere. Both the Galileo Project and the SETI Institute “are looking for indications of extraterrestrial intelligence,” he adds. “But that’s like saying that studying unknown fauna in the rainforest is similar to those who are hoping to find mermaids or unicorns.”

Loeb says a prototype sky monitor is being built now and will be affixed to the roof of the Harvard College Observatory in the spring. If the instruments work, he plans to make duplicates; if he can raise another \$100 million from private donors, he will place them around the world. He says he won’t utter the UFO word unless they see an object “that looks strange and moves in ways that human technology cannot enable.”

ONE DAY IN NOVEMBER, at a virtual meeting for the Galileo Project, the discussion turned to which “high incidence areas” would be best to first deploy the cameras. (Loeb shared Zoom recordings of several team meetings with *Science*.) The widely reported UFOs were spotted during naval training exercises off the U.S. Pacific and Atlantic coasts—making those the natural places to start the network of

UFO detectors. “Do you have the first priority location or recommendation?” Loeb asked Christopher Mellon, who was participating in his first meeting as a “research affiliate,” an unpaid adviser to the project. A former deputy assistant secretary of defense for intelligence, Mellon has publicized the UFO issue in the media for several years, talking up the national security threat he claims they pose.

Before answering, Mellon cleared his throat. “One of the problems is that many of the areas we’re seeing the greatest level of [UFO] activity are restricted military airspace,” he said. “The Defense Department is not going to be real excited about bringing in a lot of instruments to record everything that’s going on.”

The discussion was abruptly tabled, and Loeb has since danced carefully around the issue and deferred to the military concerns raised by Mellon. But they present a quandary for the Galileo Project, says Ed Turner, a Princeton University astrophysicist who is part of the project’s core research team. “The clustering of UAP incidents [in military areas] is a problem,” he says. “I’ve pointed that out to Avi.” Turner, who is more excited by the interstellar component of the project, doesn’t think the ground-based cameras will pick up any evidence of extraterrestrial visits. “If the aliens don’t want us to know about them, they’ll likely know about the Galileo Project,” he says drily. “They can just avoid our high-resolution cameras.”



The Pan-STARRS 1 telescope, atop the island of Maui in Hawaii, discovered ‘Oumuamua in 2017. STEPHEN ALVAREZ

In addition to Mellon, Galileo has nearly 50 other research affiliates—many with no background in science but a long interest in UFOs. One is Nick Pope, a former U.K. civil servant–turned–broadcaster who claims to have investigated UFO reports for the U.K. government in the early 1990s. Since then, he

has been a regular speaker on the UFO circuit and on *Ancient Aliens*, a long-running TV series that suggests aliens have shaped human history. “We very much look forward to benefitting from your knowledge and wisdom,” Loeb said to Pope after introducing him at a recent weekly Zoom meeting. (Pope says he considers himself a “communicator” and “broadcaster” and rejects being labeled as fringe.)

Another research affiliate is Luis Elizondo, a career military intelligence officer and self-proclaimed UFO whistleblower. In recent years, Elizondo has appeared widely in the media claiming to be the former director of a secretive Pentagon UFO research unit. Although Elizondo is confirmed to have worked in the Department of Defense until retiring in 2017, Pentagon spokespeople have repeatedly denied that he ever played a role in a UFO research program, much less led one. (In November 2021, however, the Pentagon did establish a UFO office, which it calls the Airborne Object Identification and Management Synchronization Group.)

After word spread on social media of Elizondo’s involvement, Loeb felt compelled to address the matter in one of the project’s weekly Zoom meetings. “I evaluate people based on their intelligence and openness of mind,” he said from the book-lined study of his home in Massachusetts, where Loeb is working on sabbatical this year. “We don’t care so much what other people said in the past. What we want is to collect our data. ... We will not entertain fringe ideas that are outside the boundaries of the standard model of physics.” Elizondo and Mellon declined to comment.

When asked directly about the dangers of involving such outspoken UFO advocates, Loeb points out that he did not recruit them; they all approached him. “We will not rely on anything these people say, just the instruments,” he insists. “I don’t care what people are associated with.” He says he prefers a big tent. “I don’t want to alienate anyone that cares about the subject, because we could benefit from their knowledge,” he says.

Many on the Galileo Project appreciate Loeb’s open-mindedness. Shostak for one isn’t bothered by the presence of the research affiliates and thinks Loeb’s star power gives a boost to a worthwhile project. “I still don’t think we’re being visited by aliens,” he chuckles. But others on the team are wary. Heng says he has become “uncomfortable” with some of the research affiliates. “This is concerning,” Heng says. “If there comes a day when the influence of the fringy people overrides the influence of people like me and other sober-minded scientists on the team, then I’m gone.”

UFO SIGHTINGS HAVE WAXED and waned in the public consciousness since the dawn of the Cold War in the late 1940s, when the term “flying saucers” first appeared. In 1953, during one wave of sightings across the United States, another Harvard astrophysicist tried to calm public jitters. “They are as real as rainbows,” Donald Menzel told *Time* magazine, referring to the saucers. Menzel explained that people were misperceiving distant objects in the skies, such as planes and balloons, or being fooled by optical illusions produced by clouds and celestial phenomena.

Over the years, many public-facing astronomers have investigated UFO claims in a similar spirit. Michael Busch, an astronomer at the SETI Institute, says they do this “in an attempt at debunking and at convincing UFO enthusiasts of their mistake, and sometimes as a way to teach astronomy.” Busch cites Carl Sagan and Neil deGrasse Tyson as others who have taken Menzel’s patient, skeptical approach.

Whether Loeb falls into this category depends on your perspective. Some, like Busch, believe Loeb is cynically riding the UFO zeitgeist to promote himself, his book, and his project. Others, like former National Science Foundation Director and astrophysicist France Córdova, find Loeb to be “imaginative” and “inspiring.” “His views may unsettle some, yet there is no doubt that the goal of finding evidence that we are not alone is an attribute that makes us distinctly human,” she says.

For his part, Loeb can sound a lot like Menzel when he wants to. He says he knows full well that most UFO sightings derive from misperception. He’ll respectfully listen to such accounts, but will put no stock in anecdotal stories, he says. “Humans are subject to hallucinations, optical illusions, all kinds of crazy stuff. You cannot trust people.” What he wants, he says, is data.

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