

A note on the possibility of Comet 3I/ATLAS being a spaceship from an advanced alien civilization

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Abstract

The intriguing suggestion that the hyperbolic Comet 3I/Atlas is an alien spacecraft is one for which the evidence appears weak but one that cannot be ruled out on the theory that life is a cosmic phenomenon for which the cumulative evidence is in our view overwhelming.

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A group of scientists have bravely proposed that Comet 3I/Atlas may not be just a comet from a distant planetary system but rather a spaceship sent out and being steered by a technologically advanced lifeform inhabiting a distant planet outside our solar system (1). The fact-related basis for this claim may be considered weak although the proposition itself is certainly not beyond the bounds of possibility.

At the present time the overwhelming evidence from astronomy and biology supports the view that life is indeed a cosmic phenomenon with complex genetic structures being distributed on a galactic or cosmic scale (2, 3, 4). It has also emerged recently from studies using the Kepler orbiting telescope that exoplanetary systems, including Earth-like planets replete with oceans, are by no means a rarity in the Galaxy. In such circumstances it is entirely plausible to argue that the assembly of cosmic genes that led to the origin and evolution of life on Earth, and ultimately to the emergence of higher life leading to technological developments on Earth, must be a common process throughout the cosmos. Furthermore, the levels of advancement of such alien technologies capable of space travel may well be ahead of our present human situation on Earth. This is the backdrop against which the alien spaceship proposal for Comet 3I/Atlas should be considered.

The vast majority of comets that show up in our skies are of course solar-system objects, and they have an origin in the Oort cloud of comets that surrounds our planetary system at a distance of about a tenth of a light year from the sun (3). Such comets remain gravitationally bound to the solar system and pursue elliptical orbits with the Sun as a focus with periods ranging from a few years to a few tens of years. Thus, Halley's comet, which made its last perihelion passage in 1986, has an elliptical orbit with a period of 76 years.

Interstellar comets following hyperbolic orbits are relatively rare and astronomers over the past few decades have discovered only a few such comets traversing through our solar system. Over the past decade Comet 3I/ATLAS is the third interstellar comet that has been observed (4). Comet *Oumuamua* discovered in 2017 and Comet *Borisov* in 2019 are also comets following hyperbolic orbits.

All three hyperbolic comets that were recently witnessed have had their origin in distant exoplanetary systems, possibly not unlike our own solar system, but located some hundreds of light years away. The most conservative interpretation of such objects is that they are simply comets originating in other systems that have somehow strayed from their parent system. The argument recently advanced for Comet 3I/ATLAS being different and special stems mainly from relatively weak evidence of a forward tail (anti-tail) as shown in Fig. 1. This can be interpreted as arising from a pre-programmed explosion event, with the intention of steering the comet's orbit through the solar system. Although such weak evidence of a forward-pointing tail cannot be ignored at the present time it remains rather weak from an observational point of view. Hibberd, Crowl and Loeb (4) speculate that this faintly detectable anti-tail of the comet could provide a braking thrust indicative pointing to a deliberate technological intervention. The hardware involved for such a space exploration project would presumably have to be embedded within an icy cometary-type conglomeration that can explain the appearance of a "normal" cometary tail. The aim of such an intervention could be, the theory goes on to suggest, to move the synthetic comet-like probe into a bound heliocentric orbit lying between the orbits of Mars and Jupiter, a move that has possibly been unsuccessful.



Fig. 1. Images by Michael Buechner and Frank Niebling on 9 November 2025
https://britastro.org/observations/observation.php?id=20251109_131937_d020b5f5984edbd4

Avi Loeb has made similar claims about other objects in the past, including Comet *Oumuamua*, the first interstellar comet that was found in 2017 (5), and we have argued the

case against such a proposal in an earlier paper (6). At the present time the speculation is mainly focussed on the comet's "anti-tail", and we can see the evidence for its existence is not yet secure (Fig.1). The anti-tail phenomenon itself is unusual but not unheard of, and we can hope that studying the phenomenon we could better understand comets of this kind.

An alternative possibility is that 3I/ATLAS is a dusty complex plasma entity held together by internal forces and immune to ice attack, surrounded by a sheath but with complex internal structure involving many smaller sheathed plasmoids connected by a network of filaments. Such an entity would have no difficulty in manifesting an anti-tail. Answers to all speculations await more data from improved observations of the body in the near future.

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