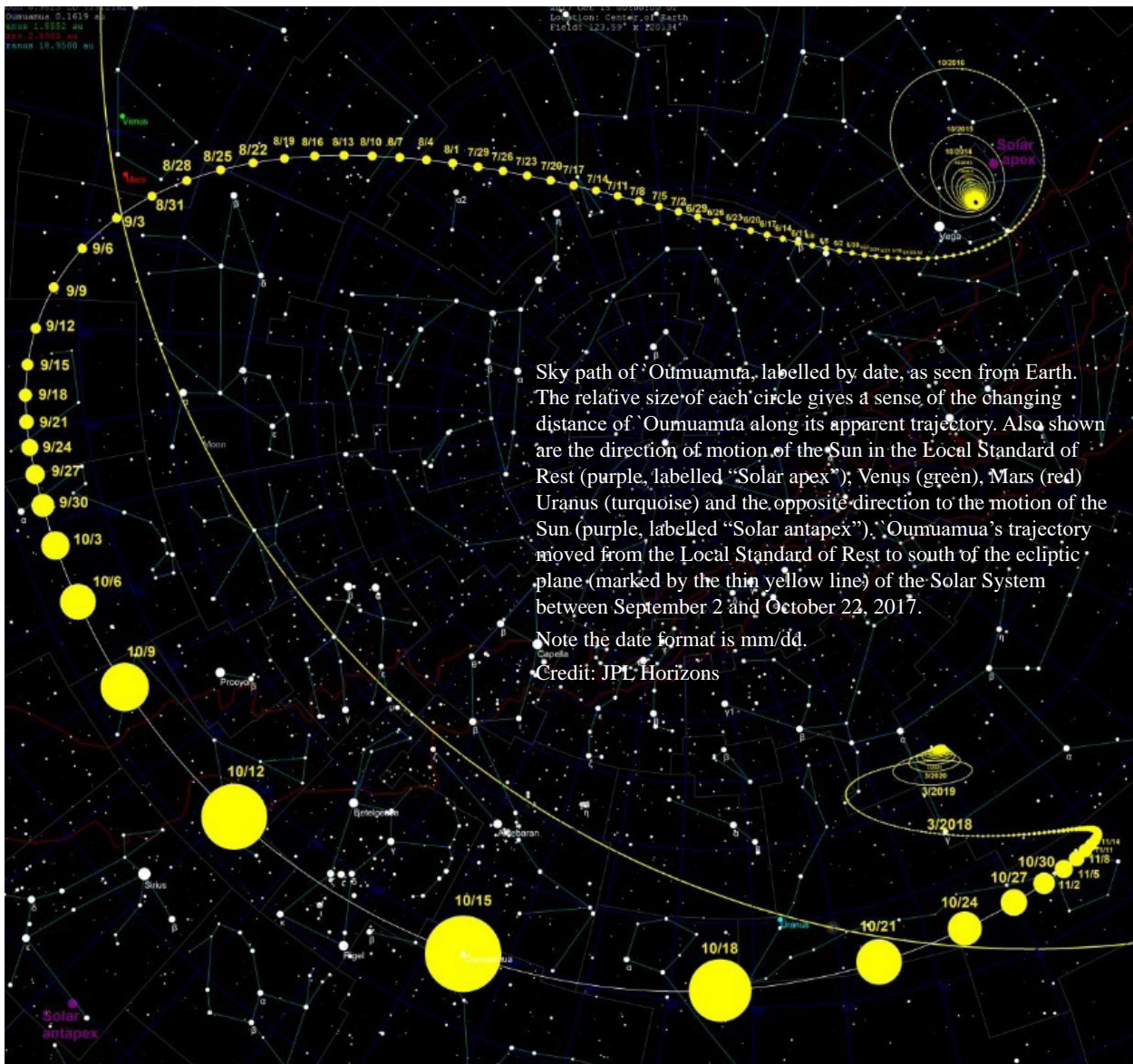


News Feature: Loeb on an Artificial Origin for 'Oumuamua

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Professor Avi Loeb remains resolute on an artificial origin for 'Oumuamua. He has long advocated the possibility of an artificial origin for this first known interstellar object (ISO), 1I/'Oumuamua, in the face of wide scepticism amongst his peers. For example the Principium piece, *An Interstellar Visitor: sorting the fact from the speculation* by Professor Alan Aylward in Principium 32, February 2021, page 53.

Neither Principium nor i4is has a collective opinion on this. Where we are, more or less, united is in the opinion that no entirely satisfactory explanation for the nature of 1I has yet been suggested. In the paper *On the Possibility of an Artificial Origin for 'Oumuamua* [1], Professor Loeb again nails his colours to the mast of the good ship "Following the Evidence" and expands on his new Galileo Project, stating that each of the natural-origin models for 1I has major quantitative shortcomings and thus the possibility of an artificial origin for 'Oumuamua must be considered. The project aims to collect data to identify the nature of 'Oumuamua-like objects (more about it in *ET Technology - the Galileo Project* in Principium 34, August 2021, page 18). 1I appears not to have been diverted towards us by the gravitation of any specific star but conforms to the "galactic neighbourhood average" the Local Standard of Rest, illustrated by this visualisation of its trajectory.



[1] open publication: arxiv.org/abs/2110.15213 and web.cfa.harvard.edu/~loeb/Loeb_Astrobiology.pdf

He cites the shape, the anomalous acceleration and the absence of detectable outgassing. He has already a book in support of his views. In his book *Extraterrestrial: The First Sign of Intelligent Life Beyond Earth* (reviewed by Patrick Mahon in Principium 33, May 2021, page 34), Loeb states "a picture is worth 66 thousand words, the number of words in my book titled, Extraterrestrial, I would have never written this book if we had a megapixel image of 'Oumuamua".

i4is, of course, has long advocated, and provided extensive evidence for, the feasibility of missions which might provide such a picture - and a lot more.

Professor Loeb cites four proffered natural explanations for the nature of 1I -

- Porous structure with a mean density a hundred times lower than air
 - Fragments from tidal disruption
 - An iceberg of molecular hydrogen
 - A nitrogen iceberg chipped off the surface of a planet like Pluto around another star
- and aims to refute all of them.

His Galileo project will look for future 'Oumuamua - like objects. He does not mention the possibility that we may wait a long time for such an object.

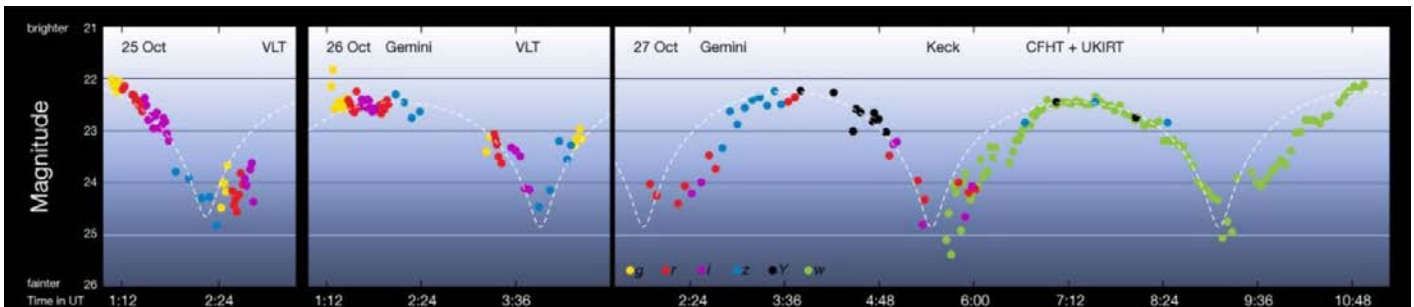


Figure 4: Variation in brightness of 'Oumuamua as observed by various telescopes during three days in October 2017. Different colored dots represent measurements through different filters in the visible and near-infrared bands of the color spectrum. The amount of reflected sunlight changed periodically by about a factor of ten (2.5 magnitudes) as 'Oumuamua rotated every 8 hours. This implied that it has an extreme shape which is at least ten times longer than it is wide when projected on the sky. The dashed white line shows the curve expected if 'Oumuamua were an ellipsoid with a 1:10 aspect ratio. However, the best fit to the light curve from its tumbling motion implies a flattened, pancake-shaped configuration rather than an oblong, cigar-shaped object as commonly depicted in the media.

Image credit: ESO/K. Meech et al.

Caption credit: Loeb

Professor Loeb shows the light curve observed from 'Oumuamua, see above, in support of his ideas about the shape of this ISO. Most researchers have come to similar conclusions so this is not controversial.

However he does not mention the regularity of the curve - which implies that the tumbling behaviour did not change. He does not mention that this also makes it unlikely that outgassing was responsible for the anomalous acceleration component in its motion unless a mechanism can be found which kept the resulting thrust vector exactly through the centre of mass.

Some of the natural object explanations suggest that objects like 'Oumuamuawill appear soon but even if they are correct then their occurrence will be random and the mathematical distribution of Monsieur Poisson applies. Professor Loeb will be free to suggest that non-arrival supports his view since we cannot expect his suggested ETIs to conform to any particular statistics. The solution, a mission to the only 'Oumuamua - like object we know, 1I itself, is staring us in the face!