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Congress of the United States
House of Representatives
Washington, DC 20515–0913

July 31, 2025

The Honorable Sean Duffy
Acting Administrator
National Aeronautics and Space Administration
300 E Street, SW
Washington, D.C. 20546

Dear Administrator Duffy:

The interstellar object 3I/ATLAS was discovered on July 1, 2025. It is expected to arrive at a distance of 53.6 million kilometers from Jupiter on March 16, 2026. This is a rare opportunity to learn about the origin of a large object that arrived at the Earth's vicinity in the inner Solar System from interstellar space. It is impossible to intercept 3I/ATLAS with a rocket launched from Earth because it would move at 98 kilometers per second relative to Earth at its passage near the Sun.

In a new paper led by Professor Avi Loeb, attached here, it was shown that applying a thrust of 2.675 kilometers per second on September 14, 2025 can bring the *Juno* spacecraft from its orbit around Jupiter to intercept the path of 3I/ATLAS. It would be appropriate for NASA to accurately assess the fuel reservoir in *Juno*'s engine and use all of it toward the goal of getting as close as possible to 3I/ATLAS at closest approach in mid-March 2026. This Memo asks NASA to conduct this study. If insufficient fuel is left, observing 3I/ATLAS from the current orbit of *Juno* will also be of great value.

The *Juno* spacecraft, named after the wife and sister of Jupiter in Roman mythology, was launched from Cape Canaveral on August 5, 2011, and entered a polar orbit around Jupiter on July 5, 2016, to conduct scientific measurements of Jupiter's composition, gravitational field, magnetic field, and polar magnetosphere. *Juno* was originally planned to be intentionally deorbited into Jupiter's atmosphere but has since been approved to continue orbiting until September 2025.

The close encounter of 3I/ATLAS to Jupiter provides a rare opportunity to shift *Juno* from its current orbit around Jupiter to intercept the path of 3I/ATLAS at its closest approach to Jupiter. The instruments available on *Juno*—namely a near-infrared spectrometer, magnetometer, microwave radiometer, gravity science instrument, energetic particle detector, radio and plasma wave sensor, UV spectrograph and visible light camera/telescope—can all be used to probe the nature of 3I/ATLAS from a close distance.

Loeb's analysis (see attached paper) focuses on an intercept, namely a flyby, since a rendezvous, where the target's velocity is matched by the spacecraft, is out of the question, owing to the excessively high hyperbolic speed of 3I/ATLAS relative to Jupiter, 65.9 kilometers per second. The feasibility of intercepting 3I/ATLAS depends on the current amount of fuel available from the propulsion system of *Juno*. However, some inferences can be drawn from the total thrust (ΔV) available at the beginning of the Juno mission. On its interplanetary trajectory, *Juno* conducted two Deep Space Maneuvers and one Jupiter orbital insertion, each of which would have placed a significant demand on the chemical propulsion employed by *Juno* (Hydrazine and oxidizer nitrogen tetroxide).

The initial fuel reservoir on Juno allows an overall initial velocity push ΔV available of 2.74 kilometers per second, similar to the ΔV of 2.675 kilometers per second required to intercept 3I/ATLAS. However, the similarity of these numbers motivated our paper. This value is similar to the required ΔV for *Juno* to intercept 3I/ATLAS. Although the engine of *Juno* was not operated since 2016, the required ΔV might potentially be within *Juno*'s performance envelope. In that case, *Juno* would be able to get close to 3I/ATLAS and use its instruments to probe the nature of the interstellar object and any cloud of gas or dust around it. Of course, much of the fuel might have been used already.

The attached paper shows that applying a thrust of 2.6755 kilometers per second on September 9, 2025, can potentially bring the *Juno* spacecraft from its orbit around Jupiter to intercept the path of 3I/ATLAS. With *Juno*'s many instruments, a fly-by can probe the nature of 3I/ATLAS far better than telescopes on Earth. The desired thrust constitutes a Jupiter Oberth Maneuver, which requires an application of ΔV only 8 days prior to the originally intended termination date for *Juno*'s plunge into the atmosphere of Jupiter. Having delivered this thrust to diminish Juno's altitude, a further ΔV is subsequently delivered, constituting a Jupiter Oberth Maneuver and resulting in an eventual intercept of the target 3I/ATLAS on March 14, 2026. In total, an overall ΔV of $2.1574 + 0.5181 = 2.6755$ kilometers per second is utilized.

It is recommended that NASA conduct a study to assess how much fuel is left in *Juno*'s engine, and I support an extension of the Juno mission at least until mid-March 2026 at a cost of about $15M per 6 months from the current expiration date of mid-September 2025. The exciting new goal to study 3I/ATLAS will rejuvenate *Juno*'s mission and extend its scientific lifespan beyond March 14, 2026. Even if *Juno*'s engine cannot be reactivated, Juno can gather unprecedented data on 3I/ATLAS from its current orbit around Jupiter.

Luna.

ANNA PAULINA LUNA
Member of Congress