

Atomos Space's last-mile satellite delivery service to run on nuclear fuel

Article

Startup to watch: Atomos Space wants nuclear power reactors up and running in space for orbital transportation.

- The Denver-based startup, launched in 2017, is navigating complicated US government regulations to test a low-power nuclear fission reactor called the **Neutrino Space Nuclear Pathfinder** in orbit, [per](#) Vice.

- The Neutrino mission is part of a larger effort to provide **“space tug” services to guide satellites to their destination orbits post-launch**, which is currently hindered by energy supply constraints in space.
- Atomos’ nuclear transit tech would also provide **satellite recovery, relocation, disposal, life extension services, and space logistics services**, according to the company’s website.
- **SpaceNukes** and **X-energy**, along with **NASA** and **DARPA**, are also working to develop space nuclear reactors.

How we got here: Fears over **nuclear weapons** deployed in space and the concern about nuclear’s safety have foiled decades worth of planning to use the energy source for orbital activities. However, the **private space industry**’s rise and approaching plans for longer-duration space travel have spurred demand for energy solutions.

- The only nuclear fission reactor the US ever sent into space was in 1965.
- In the 1980s, the Soviet Union’s nuclear space reactor contaminated Northern Canada with radioactive debris, likely fueling concerns that stalled plans in the US.
- But in December 2020, the Trump administration issued a **National Strategy for Space Nuclear Power and Propulsion**, clarifying rules for the technology and paving the way for companies like Atomos Space.
- A **statement** from Atomos’ main investor, **Cantos Ventures**, claims that **current last-mile satellite delivery is very slow due to energy limitations, and that nuclear propulsion will be needed for humans to become a multi-planetary species**.
- “Current propulsion technologies are evolutionary dead ends and can’t scale into the future space economy,” said Atomos Space **CEO Vanessa Clark**, per Space News.

The opportunity: Space nuclear reactors may be one of the easier ways to generate energy in space compared with the technical hurdles of **space-based solar arrays**.

- Reliable power for space activities could be the key to accelerating progress in satellite recovery and space exploration.
- With Earth’s orbit becoming increasingly crowded, nuclear propulsion could help prevent collisions that cause **space debris**.

A longstanding problem: In addition to the risk of accidents, nuclear fission reactors have an inherent problem with waste.

- Although the radioactivity is considerably less with low-enriched uranium, the problem of what to do with the spent fuel in space remains.
- **Avalanche Energy Designs** is working on it, but more investment is needed in nuclear fusion space reactors to solve the waste problem.
- **Plasma**, which is abundant in space, holds promise for both nuclear fusion and rocket propulsion and could enhance the power and efficiency of space travel.