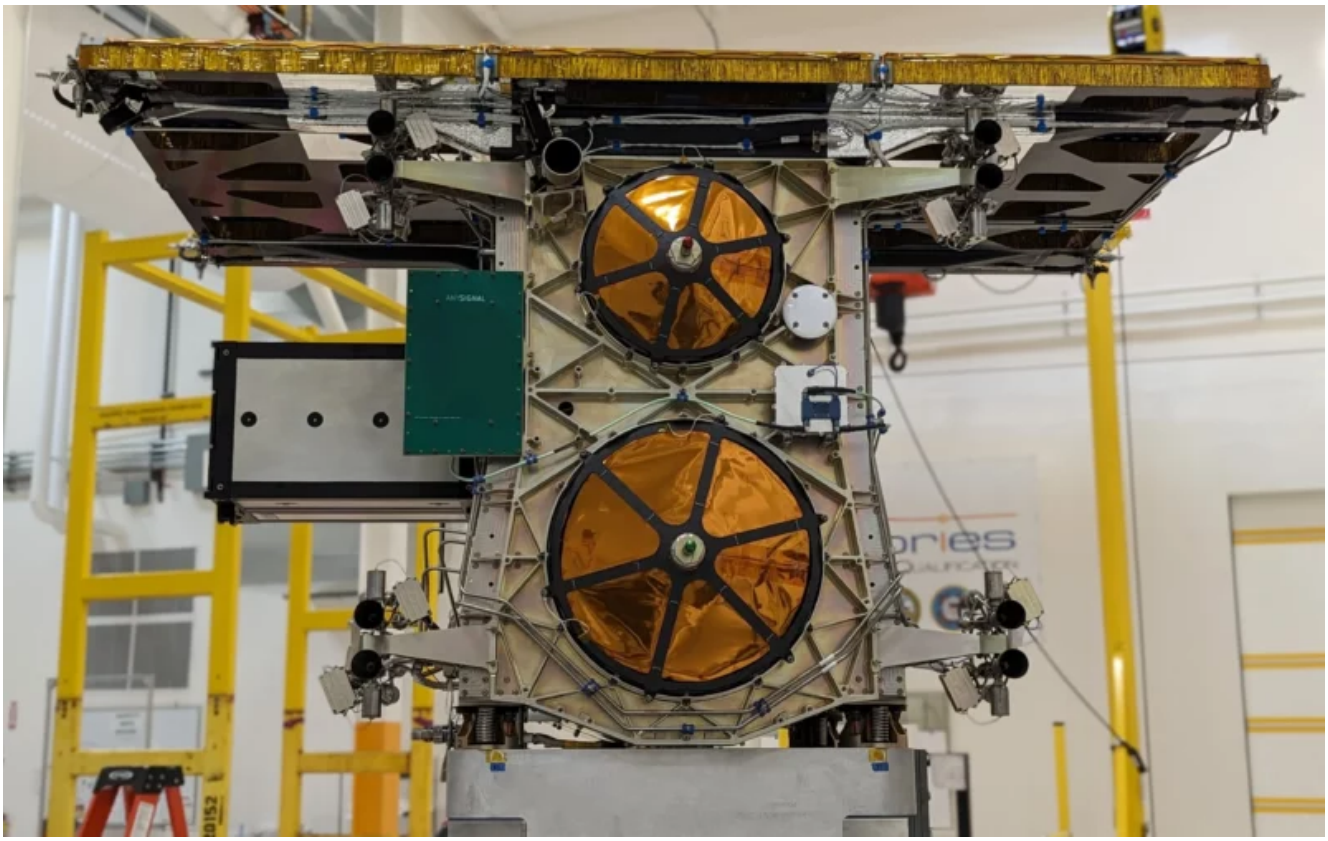
# SpaceX founding employee successfully moves from rockets to in-space propulsion



Enlarge / A close-up view of the Mira orbiting vehicle.
Impulse Space

## reader comments

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SpaceX launched its ninth “Transporter” mission on Saturday from California, carrying dozens of small- and medium-sized satellites into low-Earth orbit.

The upside of these launches for customers is that they can rely on regular, low-cost access to space aboard the reliable Falcon 9 rocket. The downside is that the satellites are all

released into a basic orbit, and if they want to reach a different altitude or inclination, they have to bring their own propulsion along for the ride.

This has led to the advent of “last mile” services from various companies offering small add-on spacecraft capable of providing in-space propulsion. One of the most intriguing of these is Impulse Space, a company founded two years ago by rocket scientist Tom Mueller, who was a founding employee at SpaceX before leaving in 2020.

During Saturday’s launch, Mueller’s career completed something of a full circle when a Falcon 9 rocket launched Impulse Space’s first vehicle, the Mira spacecraft, on a test flight. After the launch, the Mira “LEO Express 1” mission phoned home, and it relayed that all was well. So, the mission is off to a promising start.

## Anywhere in the Solar System

For Mueller, running Impulse Space is a new experience after his time at SpaceX. There, he led the development of the Merlin engines that power the Falcon 9 rocket and oversaw all elements of rocket and spacecraft propulsion. As a vice president and later an advisor, he was able to focus mostly on the technical side rather than the business aspects.

“At SpaceX, I certainly wasn’t involved in the fundraising and business side and running a whole company,” he told Ars in an interview earlier this year. “So that’s been a lot to learn. But I think I’m getting better at that. Certainly, technically, I feel like we’re super strong. We have a really great spacecraft.”

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Fully fueled, the Mira spacecraft masses about 650 pounds (300 kg) and is the size of a dishwasher. The vehicle is designed to maximize its delta-V capability, so it is mostly propellant

and fuel tanks, and powered by Saiph thrusters that operate at a specific impulse (ISP) of 290. “It’s a pretty whiz-bang little machine,” Mueller said.

Whereas SpaceX has broadened the ability of space startups to reach orbit with lower cost and reliable launch, Mueller said Impulse plans to take customers on the next step.

“SpaceX opened up access to orbit by lowering the cost of access space, and now we want to open up access to more orbits, and higher energy orbits, and going to other bodies in the inner Solar System,” Mueller said. “We want to make it cheap and easy to get anywhere in the Solar System.”

## Mars on the horizon

Impulse Space has already announced some customers for Mira, such as Orbit Fab, and plans to fly Mira spacecraft on SpaceX’s Transporter-11 and -12 missions next year. Mueller believes that as Mira demonstrates its capability, many more customers will sign on.

“We’ve signed a few customers,” he said.”We’ve got a whole bunch of people who are interested, but they want to see us flying successfully, which you know, I can’t blame them. I think, really, the floodgates are gonna open on this product line once we fly successfully. If we go out and demonstrate all the things that we want to do with this first flight, hopefully, there’ll be a lot of people signing up.”

The company’s Mira vehicle can service low-Earth orbit, and a modified version that is hardened for radiation is planned for geostationary orbit. Impulse Space is also developing a more powerful thruster, Rigel, for a Mars lander and a larger orbiter vehicle. A robotic mission to Mars will fly no earlier than in 2026 on a Terran R rocket built by Relativity Space.

Despite a difficult fundraising environment, Impulse Space has

continued to find financial backing. In July, the company announced that it had raised $45 million in Series A funding, led by RTX Ventures. A year earlier, Impulse said it raised $30 million. So maybe Mueller is getting the hang of fundraising and running his own company.

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