Axiom's private mission inches commercial space station dreams closer to reality

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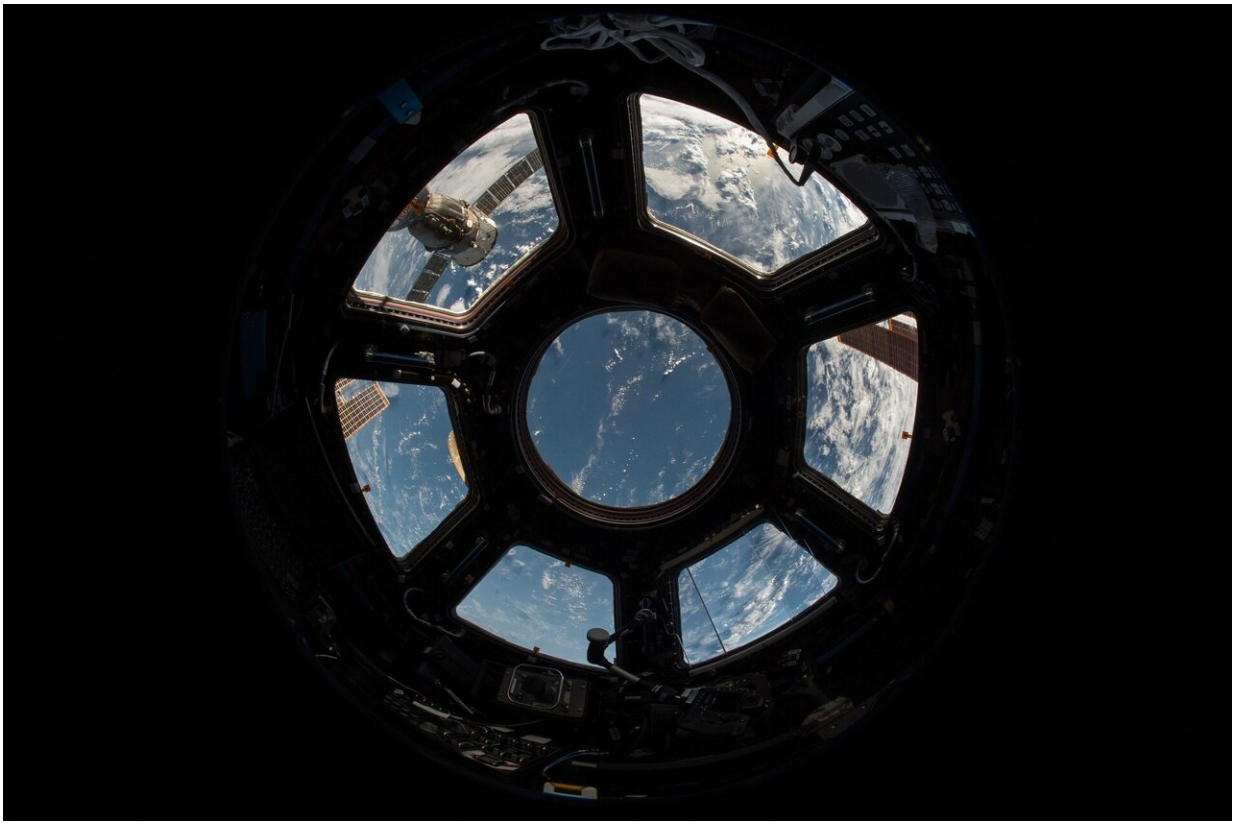

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Axiom Space made history in 2022 with the first all-private mission to the International Space Station. The company is ready to do it again, but with more focus on its endgame: having its own commercial space

station in what could potentially be a crowded playing field in low-Earth orbit.

"The goals of these missions, which we sometimes call precursor missions, are to build up first the Axiom internal operations capability—the tools, the processes—to train flight controllers that are going to be required down the line to operate our Axiom Station in the future," said Axiom Space's Derek Hassmann, chief of mission integration and operations.

The Axiom Mission 2 (Ax-2) flight is slated to send a crew of four to the International Space Station inside SpaceX's Crew Dragon Freedom atop a Falcon 9 rocket from Kennedy Space Center's Launch Pad 39-A.

Liftoff is targeted for Sunday at 5:37 p.m. with a lone backup opportunity on Monday at 5:14 p.m.

Space Launch Delta 45's weather squadron forecasts only a 60% chance for good conditions with worse weather predicted for Monday. Because of a busy schedule at the ISS as well as competing uses for the KSC launch pad, if the rocket can't go up in this window, the mission could see a delay into at least August.

If it does launch, SpaceX will attempt recovery of the first-stage booster back at nearby Cape Canaveral Space Force Station's Landing Zone 1, a first for one of its crewed flights, and will bring the signature sonic boom to the Space Coast as it comes in for a touchdown.

The crew features former NASA astronaut Peggy Whitson as commander, becoming the first woman to command a private space mission.

Now Axiom Space's Director of Human Spaceflight, she has flown on

both the space shuttle and Russian Soyuz spacecraft and holds the American record having already spent 665 days in space. This flight, if it stays on schedule, would tack on about 10 more days, eight of which would be spent on board the ISS beginning with a planned docking Monday at 9:30 a.m.

Along for the ride is private customer and aviator John Shoffner who will act as pilot. He and Whitson were the backup crew for the Ax-1 mission. The two remaining seats go to a pair of Saudi Space Commission astronauts, Rayyanah Barnawi and Ali AlQarni.

Barnawi will become the first Saudi woman in space and the pair will be the first Saudis to visit the ISS.

"Once they get their space legs under them, I know these guys are going to be extremely competent and I'm really looking forward to watching them perform," Whitson said. "I have no questions or concerns about either the integration of our crew or their capabilities. I think we are ready to go."

Unlike Ax-1, the crew is a mix of private and government customers, a shift in Axiom Space's business plan that it intends to pursue even more with upcoming flights to the ISS. The Ax-3 mission has already been approved by NASA and could come before the end of the year.

The three private customers who flew on Ax-1 paid $55 million each to Axiom Space for what ended up being about two weeks in space. Axiom in turn has to pay SpaceX and NASA for the travel and accommodations for these missions.

The fees paid by the Ax-2 or future customers, though, has not been revealed.

The plan is for Axiom Space to construct its own living and working space in modules attached to the ISS, the first of which is expected in late 2025. Until then, NASA looks each year to support up to two private missions, open to Axiom or its competitors. Each opportunity to visit will make Axiom's space station plans run smoother, Hassmann said.

"It builds working relationships with NASA and with SpaceX so that when we eventually get to the point where we launch our first module, we'll have a solid capability in place that's based on these precursor missions that we've executed," he said.

A second module will greatly expand Axiom's flexibility with space for up to eight crew and its own two docking ports. A third research and science module will join by 2027. Axiom recently announced that it would refurbish what NASA used to cart cargo to and from the ISS during the Space Shuttle Program.

Nicknamed Raffaello, it's one of three Multi-Purpose Logistics Modules NASA built, but has been in storage at KSC since its last flight on Space Shuttle Atlantis in 2011.

Axiom's plan will be to detach its three modules from the ISS and marry them to its own power and life-support system to become Axiom Station by 2029, one year ahead of the ISS's planned retirement.

Axiom, though, isn't the only private space station expected to be orbiting Earth this decade. NASA has awarded three contracts for groups to pursue their own standalone space stations: Starlab from Lockheed Martin, Nanoracks and Voyager Space; Orbital Reef from Blue Origin, Sierra Space, Boeing and others; and one from Northrop Grumman—but none likely would be in business until 2027 at the earliest.

"There are also a number of other private companies that are working toward commercial destinations, some who have reached out to NASA, some that are off working on their own," said Angela Hart, manager of NASA's Commercial Low Earth Orbit Development Program.

That includes Long Beach, California-based startup Vast, which last week with SpaceX announced plans to get its own relatively small space station in orbit as early as August 2025. The single module could be flown on a Falcon 9 with plans for a Crew Dragon spacecraft to bring its first four passengers soon after, the company stated.

Hart said NASA's goal is to award service contracts for a commercial low-Earth orbit destination in 2026, setting up the option to fly astronauts to that space station before 2030.

"Lots of folks are working things even sooner than that, which is great," she said. "We'd love to see things up there earlier that we can see time on orbit, and lots of lessons that they'll learn as well, as we will just like we are here on these [private astronaut missions]. So it's going to be a very exciting next couple of years as we move in that direction."