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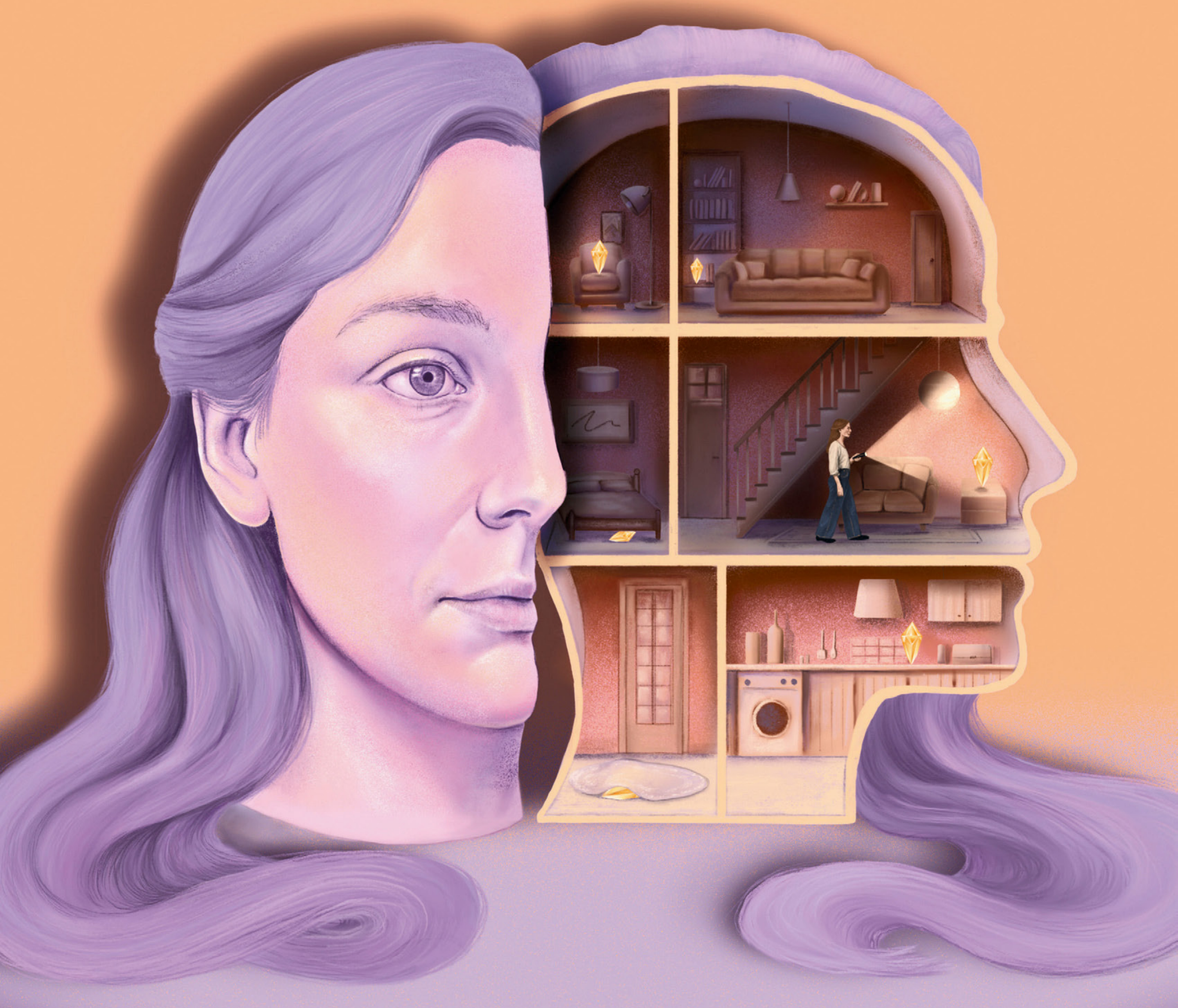

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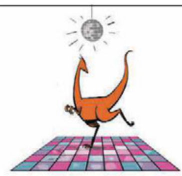

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DISCOVERIES

SPACE

First commercial space station is readying for launch

For the first time in human history, a space station built by a start-up, not a nation, is set to enter low Earth orbit

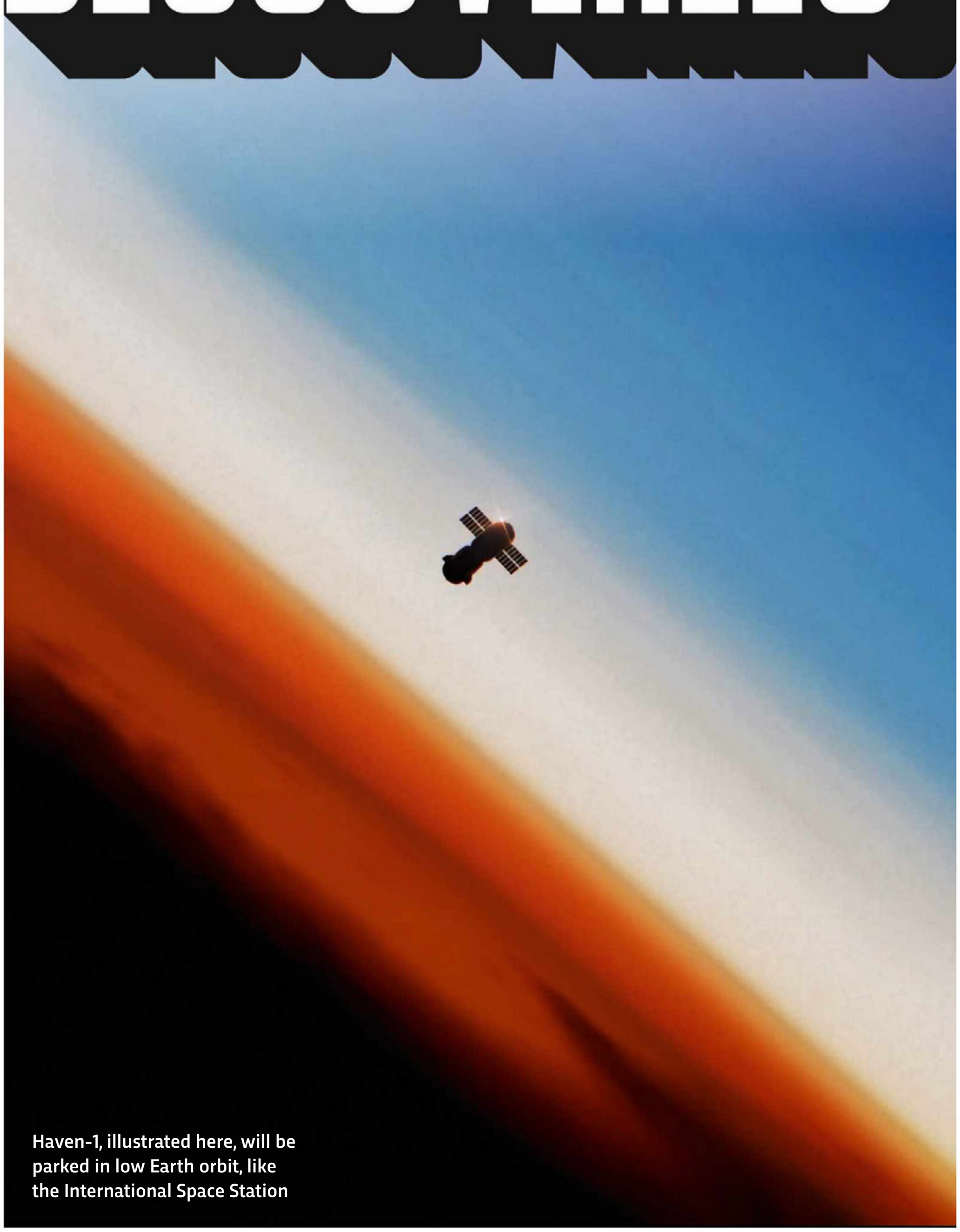
In 2026, a team of astronauts will float inside a glossy white cylinder orbiting hundreds of kilometres above Earth. But this won't be the International Space Station (ISS). It'll be Haven-1 – the world's first commercial space station, built by a private aerospace company called Vast.

Expected to launch in May 2026 on a SpaceX Falcon 9, Haven-1 represents a radical shift in the way people will live and work in space.

"If we're able to do this before we win the NASA contract [to replace the ISS] using our own funding, we'll be not only the world's first commercial space station, but the only one of the expected bidders to have done that," Vast's CEO Max Haot told *BBC Science Focus*.

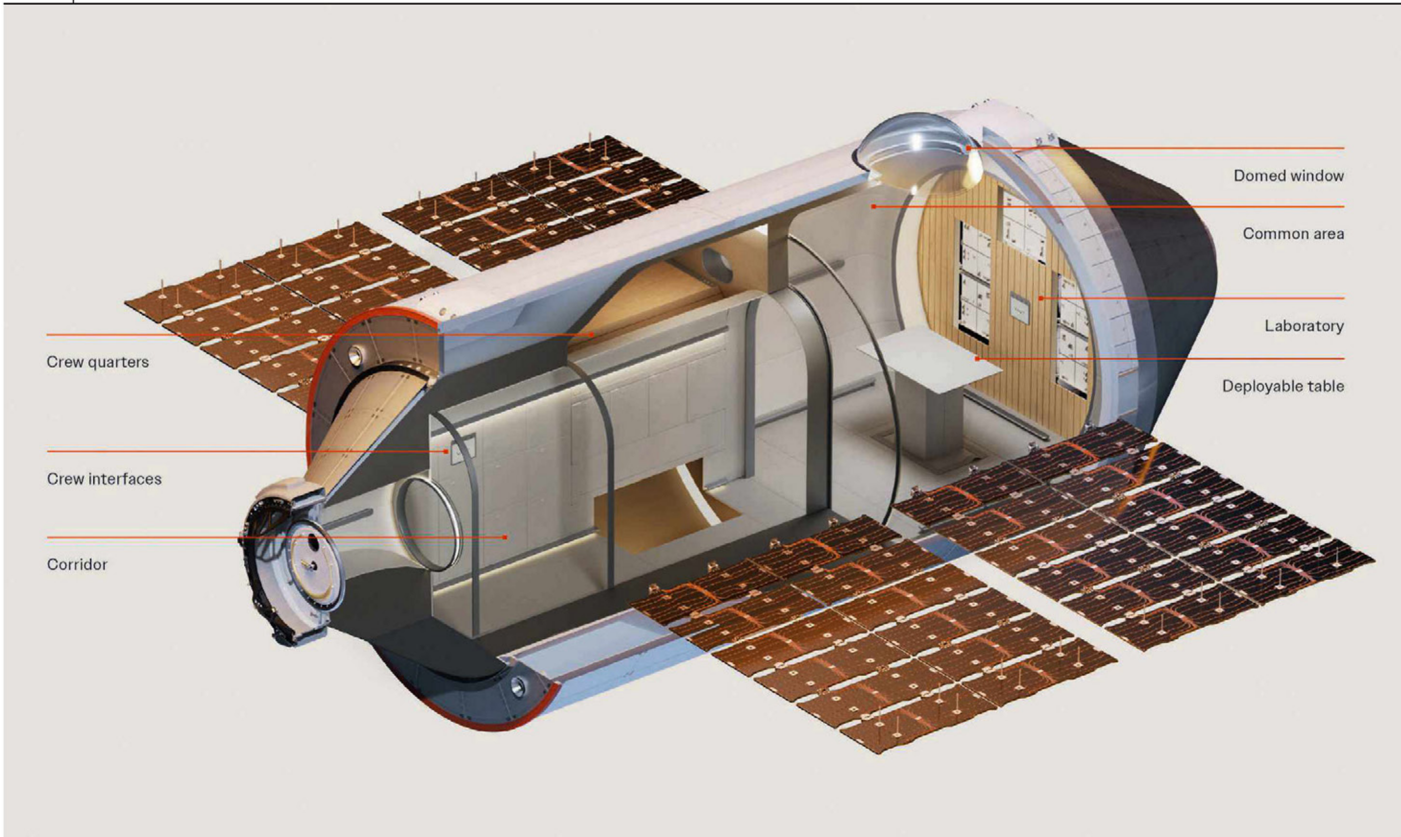
KEEPING THINGS SIMPLE

Vast's approach is fast, focused and unashamedly pragmatic.



Haven-1, illustrated here, will be parked in low Earth orbit, like the International Space Station

VAST, ADAM GALE X3



Instead of building a sprawling orbital laboratory, the team at Vast has designed a tightly constrained system that does just enough – safely.

At 45m³ (1,590ft³), Haven-1 has roughly the interior volume of a small tour bus. Its life-support system borrows from earlier NASA tech, running on a simpler 'open loop' design like that used on the Space Shuttle.

Crew members won't stay for months here, like they do on the ISS. Instead, four astronauts will visit for roughly 10 days at a time, arriving on a SpaceX Dragon spacecraft. Over Haven-1's three-year orbital lifetime, only four such missions are planned.

"The number one priority for Haven-1, as a demonstration of a minimum viable product space station, is safety," Haot says. "Number two is to make it happen within this unprecedented timeline. A rapid timeline also means lower cost."

Keeping things simple allows Vast to move quickly. The primary structure is already being assembled and is due for initial testing this summer, following completion in July. By early 2026, the entire system should be integrated and undergoing final tests in preparation for launch.

"The primary structure is already being assembled and is due for initial testing this summer"

INTERIOR DESIGN

Visually, Haven-1 is a striking departure from its predecessors. The ISS – though a miraculous feat of engineering – has always looked a little like a floating plumbing supplies store. Haven-1 is designed to look more like something from science fiction. Its interior is clean, considered and unusually elegant for a space habitat.

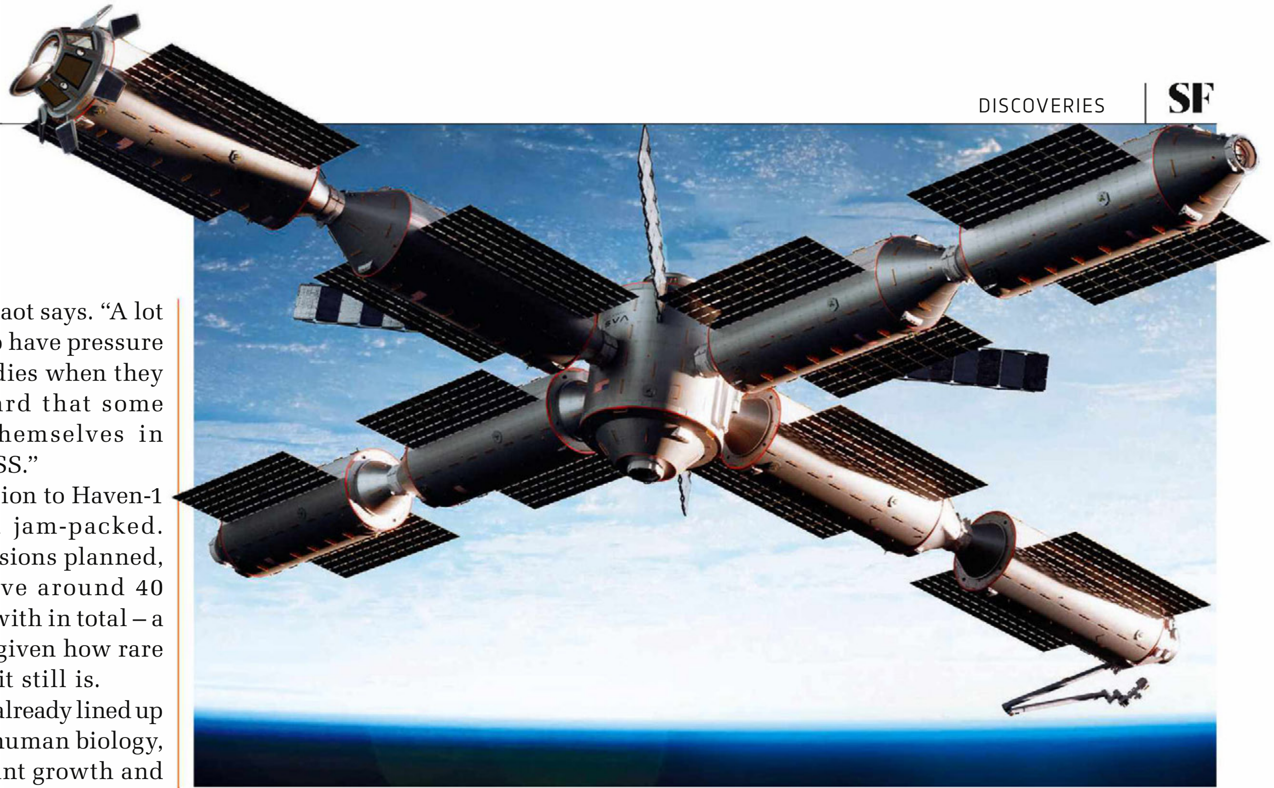
But this aesthetic overhaul isn't just for show. It's about function. "We go to space to work," Haot says. "It's not difficult to understand that if you're able to rest better, feel better and communicate better, you're going to work better."

Guided by veteran NASA astronaut Andrew Feustel – who spent over 200 days in space and conducted spacewalks on both the Shuttle and the ISS – the Vast team has rethought the basics of crew comfort.

Sleeping, for instance, will take place on inflatable beds that apply gentle pressure to the body, mimicking Earth conditions and thereby providing a sensation some astronauts crave in microgravity. "People want to sleep in different

ABOVE Offering its four occupants just 45m³ (1,590ft³) of living space, the Haven-1 is almost seven times smaller than the ISS, which provides astronauts 388m³ (13,696ft³) to live and work in

VAST X3



ways on the ISS," Haot says. "A lot of astronauts like to have pressure applied to their bodies when they sleep – we've heard that some of them wedge themselves in cupboards in the ISS."

Each 10-day mission to Haven-1 will be short but jam-packed. With four such missions planned, scientists will have around 40 crew-days to work with in total – a valuable resource, given how rare human time in orbit still is.

Research projects already lined up include studies in human biology, drug screening, plant growth and protein crystal formation.

Between missions, the station will be used to test artificial gravity systems – an early step toward making long-duration space travel safer and more viable.

NEXT-GEN SPACE PLATFORM

There's more to Haven-1 than just research. It's a calculated move in a much bigger race.

NASA plans to retire the ISS around 2030 and is currently evaluating bids for the next generation of orbital platforms.

Haot wants Vast to win that contract and launching Haven-1 early, with private funding, is a bold way to leapfrog the competition. "Our strategy is to be the one that has done the most out of all the competition – to be the furthest along in technology development, team, facilities and proof point," Haot says. "We've kind of already reached that point."

The race is by no means won, however. Another company, Axiom Space, has already been awarded a $140m (£102m) contract with NASA to attach at least one module to the ISS. Construction at Axiom is underway, with the first launch targeted for the end of 2026.

If Vast achieves its goals, it'll be in a strong position when NASA makes its decision in 2026. But even if Vast is unsuccessful, Haot insists Haven-1 will still have value. Vast may look to foreign governments and private organisations if its NASA goals don't come to fruition.

ABOVE To help maximise space in Haven-1 this table can retract into the floor of the habitat

TOP Haven-2 is expected to have a central core and detachable modules, each of which will be bigger than Haven-1

"We still think there's likely a bright future for Vast, but internally we're very focused on this," Haot says. "It's the biggest opportunity in the world right now in the space station market."

THE FUTURE OF SPACE

Haven-1 is only the beginning. Vast's next step is Haven-2 – a more advanced module that follows the same approach. From 2028 onwards, the company plans to launch new modules roughly every six months, eventually assembling a full commercial station by 2032.

This modular future opens the door to more frequent crewed missions, private research programmes and, eventually, a broader orbital economy.

And thanks to a deal with SpaceX, Haven-1 will also be the first space station to hook up to Starlink, providing gigabit-speed internet to those in orbit – a leap forward for real-time communication, outreach and data transfer.

"Aboard Haven-1, if you want to speak to somebody 24/7, you can," Haot says. "That's going to be very different in how the general public and the crew can interact."

Haven-1 won't be the most advanced station in orbit, but by showing that space infrastructure can be lean, elegant and commercially viable, Vast hopes to redraw the map of low Earth orbit. Whether for science, exploration or industry, Haot is betting that the future of space doesn't belong to nations. It belongs to whoever gets there first.

"The purpose is not to build a luxury hotel in space and attract tourists," Haot says. "The purpose is to build a great environment to be and work in. "It's not without risk… We'll just have to see what happens in reality."