

# The ISS Revolution, Just the Start

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## 1. Introduction

*Twenty-five years ago, humanity launched a bold endeavor: to live and work together in space, not for a fleeting time, but continuously. What began as a fragile framework of modules has since grown into the most enduring platform for international cooperation in orbit — the International Space Station (ISS).<sup>1</sup>*

*We recently hit a truly historic milestone: 25 years of continuous human presence in space.*



*Think about that for a moment. For anyone under the age of 25, a world where humans aren't continuously living in space simply doesn't exist. The International Space Station has been a constant in their lives, quietly orbiting above, and for more than a quarter century, it has remained the premier proving ground and a world class laboratory.*

*The space station has been a research laboratory like no other, leveraging microgravity and the unique environment of space to conduct experiments and investigations that push boundaries and challenge the lens we view things through. Leveraging the orbital outpost has led to groundbreaking discoveries like cool flames in space, which opened new frontiers in combustion science and engine design, the creation of the fifth state of matter, the bioprinting of the first human knee meniscus and heart tissues, and advancements in drug developments to help cancer patients.*

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<sup>1</sup> Dana Weigel. International Space Station Program Manager, “The International Space Station (ISS) 2026 Calendar,” <https://www.nasa.gov/wp-content/uploads/2025/12/2026-international-space-station-calendar.pdf?emrc=2d2f69>

*The decades of research conducted on the space station has profound impacts on each of our lives here on Earth. I'm incredibly proud of everything we've accomplished and excited for what comes next. The space station isn't just a place where we live and work in space, it's a launchpad for the future of humanity in low Earth orbit.*

*The space station is a critical steppingstone that has paved the way for our return to the Moon and our journey to Mars by serving as a testbed for the technologies we'll need for long-duration spaceflight. From recycling 98% of our water to growing over 50 species of plants, from 3D printing tools with recycled materials to testing new radiation tools and laser communications systems, the space station provides the foundational knowledge and technology that will enable our next giant leaps.*

*The success of the space station is not just a result of the astronauts working on orbit, but from the dedicated teams at NASA, across the United States, and around the world. The space station is a testament to decades of innovation, collaboration, and dedication of people who are part of something bigger than themselves to benefit life here on Earth and to take us further than we've ever gone before. This global endeavor, with five international partners, nearly 300 visitors from 26 countries, and over 4,000 experiments conducted by almost 5,000 researchers across more than 110 countries, proves what we can achieve when we work together. I wish you a wonderful 2026 and thank you for following the ongoing journey of the International Space Station.*

## **2. What Will Replace the International Space Station?**

*The International Space Station is nearing retirement, and NASA is preparing a shift toward commercial space stations instead of a single ISS replacement. This move creates a shared low Earth orbit (LEO) system where private companies handle research, transport, and orbital operations.<sup>2</sup>*

*NASA, SpaceX, and industry partners will each play a role as the ISS heads toward deorbit around 2030. Commercial LEO destinations are expected to support science, tourism, and manufacturing, forming a network of private space stations rather than one central facility.*

### **2.1. Why NASA Is Moving Beyond The ISS?**

*The International Space Station is nearing retirement, with its operational life expected to end around 2030. This marks a major turning point in how NASA approaches human presence in space.*

*Instead of building another large government-owned station, NASA is shifting toward a distributed model in low Earth orbit. The focus is on continuous access rather than a single flagship structure.*

*Commercial partnerships are central to this change, with private companies developing space stations for research and astronaut missions. NASA will act more like a customer, buying services instead of operating infrastructure directly.*

*SpaceX and other partners will help manage transport and deorbit planning, while transition overlap ensures the ISS continues working alongside early commercial platforms.*

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<sup>2</sup> Glanze Patrick, "What Will Replace the International Space Station? The Commercial Space Stations of the Future," June 24, 2026, <https://www.sciencetimes.com/articles/61980/20260624/what-will-replace-international-space-station-commercial-space-stations-future.htm>

## 2.2. Which Commercial Space Stations Can Replace ISS?

*No single ISS replacement is expected, as NASA is moving toward multiple commercial space stations in low Earth orbit rather than one structure.*

*Key private projects include Axiom Space, Orbital Reef, Starlab, and Vast, each competing to become part of the ISS replacement ecosystem.*

*These designs vary from modular to inflatable stations, supporting research, manufacturing, tourism, and private missions as part of an expanding space economy.*

## 2.3. The Future of Private Space Stations

*Private space stations are expected to reshape how humans live and work in low Earth orbit after the ISS retires. Instead of a single large government facility, multiple commercial platforms may take over different roles in research, industry, and crewed missions. This shift signals a move toward a more flexible and commercially driven orbital environment.*

**More specialized orbital platforms:** *Future private space stations will likely focus on specific functions like research, tourism, or manufacturing.*

**Smaller and more flexible crews:** *Unlike the ISS, these stations may support fewer astronauts with more targeted missions.*

**Technological diversity:** *Designs may vary widely, including inflatable modules and modular assembly systems.*

**Risk of timing gaps:** *Delays in development could create a gap between ISS retirement and the arrival of operational replacements. NASA's dependency on industry: Continued low Earth orbit access will depend heavily on private sector delivery timelines.*

**Competitive orbital economy:** *Multiple stations may operate simultaneously, offering different services and pricing models. New research opportunities: More platforms could expand scientific experimentation beyond what a single station could support.*

**Shift in how orbit is used:** *Low Earth orbit may evolve into an active commercial zone rather than a single-government workspace.*

## 3. The Next Outpost: NASA's Plans

*When your car gets old, you may face the decision of whether to spend money repairing it or replacing it. NASA is facing a similar dilemma with the aging International Space Station. Within the next year, NASA must choose whether to make repairs and updates that would extend the life of the Space Station or to replace it with a commercial outpost...<sup>3</sup>*

*The International Space Station orbits Earth from nearly 250 miles above. It circles our planet every 90 minutes at a speed of 17,500 mph.*

*For more than 25 years, the Space Station has allowed humans to live off planet. About the size of a football field, it has living quarters to house an international crew of up to 7 astronauts or cosmonauts at a time. Over its lifetime, the Space Station has hosted nearly 300 astronauts from 26 different countries across the globe. (See image on page 1 of this paper.)*

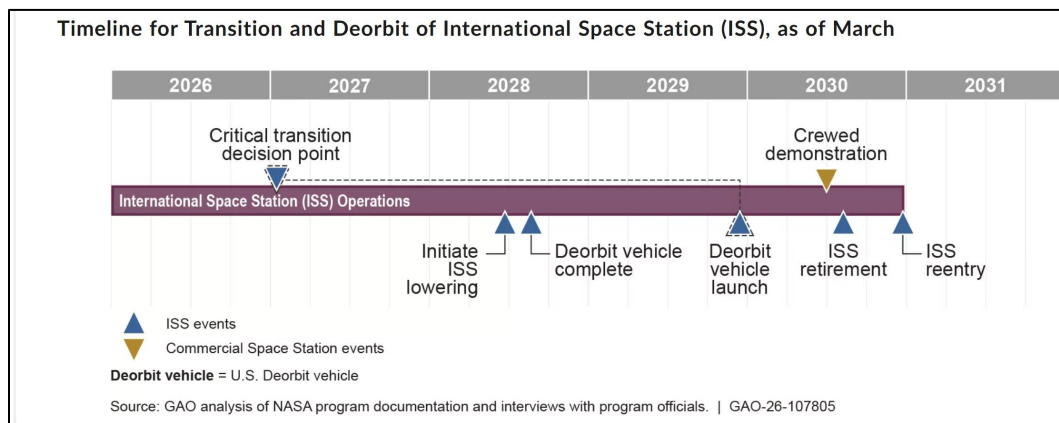
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<sup>3</sup> <https://www.gao.gov/blog/next-outpost-nasas-plans-replacing-aging-international-space-station#>

*The outpost is also outfitted with several labs to allow for scientific experiments in space. Astronauts research everything from advanced medicine and physics to what happens to the human body in space.*

*The Space Station was funded and built through a collaboration of five participating space agencies from 15 different countries. However, the U.S. bears the majority of the costs to run it. NASA spends nearly \$3 billion a year to operate and maintain the aging government-owned space station.*

*The original plan was for the Space Station to be used about 15 years. But now, more than a decade beyond that, the outpost is facing some structural issues that risk its mission and could result in higher costs for maintaining it. Because of this, NASA plans to retire and deorbit the current station by 2030, and the space agency has begun exploring replacement options.*



## 4. The Future: Commercial Space Companies

*With just a few years left on the current scientific outpost, the U.S. space agency is counting on private companies to launch their own orbiting stations to replace it.*

*In fact, NASA wants to transition from the government-owned station to commercially operated, private space stations. The agency has partnered with six aerospace companies to develop commercial successors. From these efforts, NASA will award contracts to selected companies to further develop prototypes and finalize designs.*

*The space agency doesn't intend to take ownership of a new station. Instead, the selected U.S. companies would design, build, own, and operate their own stations. They would also maintain related ground system control centers and support infrastructure.*

*NASA's role in overseeing the new stations would include certifying that they are safe for its space crews. And it forecasts that relying on commercial stations will drive down the costs for astronauts to conduct research in space and free up agency resources for other exploration projects.*

## 4.1. NASA Decisions

*There's a sense of urgency for getting plans in place—particularly since NASA wants to preserve America's continued human presence in space. But we found several risks with NASA's current plans. For example, the timeline for replacing the Space Station is rather ambitious. Under current plans, NASA has just over a year to determine if it should extend operations on the current space station beyond 2030. If it chooses to replace the Space Station, the agency will need a plan in place sooner rather than later. After all, if it's not ready, the U.S. runs the risk of not being able to maintain human's presence in space.*

*Agency officials said they are confident the current space station's life could be extended through the late 2030s if needed. But it may become more challenging to maintain and repair the Space Station as it ages. Note that the Space Station is now operating well beyond the 15-years for which NASA and its partners designed and tested it.*

*There are some budget and workforce constraints, too. Deorbiting the Space Station is expensive, as is the process of designing new ones to replace it. And maintenance of the current space station is a big concern. For example, NASA and its international partners are monitoring cracks in the transfer tunnel in the Russian segment of the Station that resulted in air leaks. As of February, NASA said those air-leaks had been fixed with a sealant. But leaks continued and the fundamental structural issues that caused the cracks remain.*

*In short, NASA is still developing its transition plans and many uncertainties remain. But a decision is needed soon to ensure the success of NASA's next steps. For more information on the agency's plans and timelines, read our Q&A report.*