

Axiom's Commercial Space Station and ESA

Axiom Space, Inc., also known as *Axiom Space*, is an American privately funded space infrastructure developer headquartered in Houston, Texas.

Founded in 2016 by Michael T. Suffredini and Kamal Ghaffarian, the company first flew a spaceflight mission in 2022: Axiom Mission-1, the first commercially crewed private spaceflight to the International Space Station (ISS). [2]

The spacecraft used was a SpaceX Crew Dragon. The crew consisted of Michael López-Alegría, an American born in Spain and a professionally trained astronaut hired by Axiom, Eytan Stibbe from Israel, Larry Connor from the United States, and Mark Pathy from Canada. [2]

The company aims to own and operate the world's first commercial space station (*Axiom Station*) in the late 2020s. The company's employees include former NASA Administrator Charles Bolden and astronauts Michael Lopez-Alegria and Brent W. Jett Jr.

Axiom Station intends to have its spacecraft modules individually launched and assembled in-orbit, first attaching to the International Space Station. Before ISS retirement (and atmospheric reentry), the company plans to detach its modules and commence orbit on its own as Axiom Station. [1]

Axiom also plans human spaceflight for government-funded and commercial astronauts engaging in in-space research, in-space manufacturing, and space exploration. [1]

ESA/Axiom MOU

The European Space Agency ESA and Axiom Space signed a Memorandum of Understanding (MOU) on 1 October 2023 in Paris to explore collaborative opportunities in human spaceflight, science, technology, and commercialization.



Josef Aschbacher, ESA left and Michael Suffredini CEO of Axiom Space



Axiom Space's first commercial space station: The Axiom Station

Key areas addressed in the Memorandum of Understanding include: [3]

- Broadened collaboration: Both organizations have expressed the intent to foster science and technology development, potentially collaborating on Axiom Space missions to the International Space Station (ISS) and post-ISS low-Earth orbit activities.
- Astronaut missions: Axiom Space is set to support ESA's goals for institutional astronaut missions and may also assist with nationally sponsored missions for ESA Member States. The first ESA-sponsored commercial astronaut mission to the ISS took place with Axiom Space on Axiom Mission-3 on January 18, 2024. ESA project astronaut Marcus Wandt of Sweden was mission specialist on the all-European crew of four with Walter Villadei (Italian) and Alper Gezeravcı (first Turkish astronaut) led by Axiom Space Chief Astronaut and Commander Michael López-Alegría.
- Innovation in spacesuits: European companies will find collaboration opportunities around the development of the Axiom Extravehicular Mobility Unit spacesuits to participate in various stages including training, operation, and maintenance.

- Research and development: Both partners seek to further research projects on upcoming missions, leveraging European advancements in robotics, artificial intelligence, health, and life sciences.

Within this cooperative framework, in late in 2024 another landing robot (IM-2) is to be launched to the moon's south pole by *Intuitive Machines*, co-owned and founded by Kam Ghaffarian to provide lunar surface access, lunar orbit delivery, and communication from lunar distance [4].

There will be a German experiment on board: The German Aerospace Center (DLR) and the Free University (FU) of Berlin have radiometer on a "hopping robot" that is to be launched from the moon lander. With its temperature measurements, it is supposed to find places on the lunar surface that are cold enough for stable water ice. This material is crucial to build and maintain a station on the Moon. [5]

- Access to *Axiom Station*: The MOU opens doors for European missions to access the world's first commercial space station, Axiom Station, by the end of the decade, encouraging ongoing human spaceflight opportunities, research, commercial business development including future European cargo and crew service providers, and more.

The MOU enters immediately into effect and will span an initial period of three years, with options for extension based on mutual agreement.

Both organizations anticipate that this partnership will not only propel advancements in space exploration and discovery, but also foster a spirit of international cooperation and innovation within the global space community.

Michael Suffredini, CEO of Axiom Space, commented on the collaboration, saying, "This MOU signifies a new era in international space collaboration. Together with ESA, we aim to enhance our collective capabilities in human spaceflight, fostering scientific innovation and expanding access to space. Together, we are building a future where European astronauts regularly embark on Axiom Space missions, further developing our pioneering space communities."

The Director General of ESA, Josef Aschbacher, remarked, "Our collaboration with Axiom Space represents a step forward in Europe's endeavors in space. The combination of Axiom Space's innovative approach to spaceflight and ESA's rich history and experience will create new opportunities not only for scientific and technology advancements, but also for nurturing a sustainable commercial space ecosystem." [3]

Construction of Axiom Station is Underway

The construction of the world's first commercial space station, Axiom Station, is underway. Following the completion of preliminary and critical design reviews in collaboration with NASA, the partners at Thales Alenia Space began welding and machining activities for the primary structures of Axiom Station's first module. The first pieces of fabricated flight hardware are beginning to come together, and the module will be delivered to Houston soon where final assembly and integration will be completed. Axiom Space is preparing for a 2026 launch.

Axiom Space is the only company with the privilege of connecting its modules to the ISS. This partnership and strategic connection allows Axiom Space to effectively adopt and service the multinational user base of the ISS to seamlessly continue research and manufacturing initiatives.

Axiom Station will host people, research and manufacturing that will lead development for numerous industries using techniques that are available only in microgravity. The station will also service the rapidly expanding infrastructure and solutions operating in space and provide an accessible platform for private companies and national governments to continue the research and development of breakthrough innovations. [6]

Kamal Ghaffarian's dream: "In 2026 the first module of our own space station will be opened so my dream will come true ... by going there myself" [5]

Kamal Ghaffarian's vision: "In the future, we will see space shuttles that fly off every hour to a city in space with artificial gravity, companies, and other facilities.

Daily trips to the moon where there will be a habitat in which people live and work. Weekly flights to Mars where people will work and live, and maybe even monthly trips outside of our solar system."

[5]

References

[1] Wikipedia [Axiom Space - Wikipedia](#)

[2] Wikipedia [Axiom Mission 1 - Wikipedia](#)

[3] ESA Memorandum of Understanding

https://www.esa.int/About_Us/Corporate_news/ESA_and_Axiom_Space_forge_partnership_for_future_space_exploration

[4] https://en.wikipedia.org/wiki/Intuitive_Machines

[5] Der Spiegel:Nr.15/April 6.,2024, page 96-97

[6] Construction <https://www.axiomspace.com/axiom-station>

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