Introduction to Axiom Space

Rex Walheim
TRISMAC 2024

1998	2000	2030
LAUNCHED WITH 15 MEMBER NATIONS	HAS BEEN CONTINUOUSLY CREWED	PLANNED TO BE DECOMISSIONED

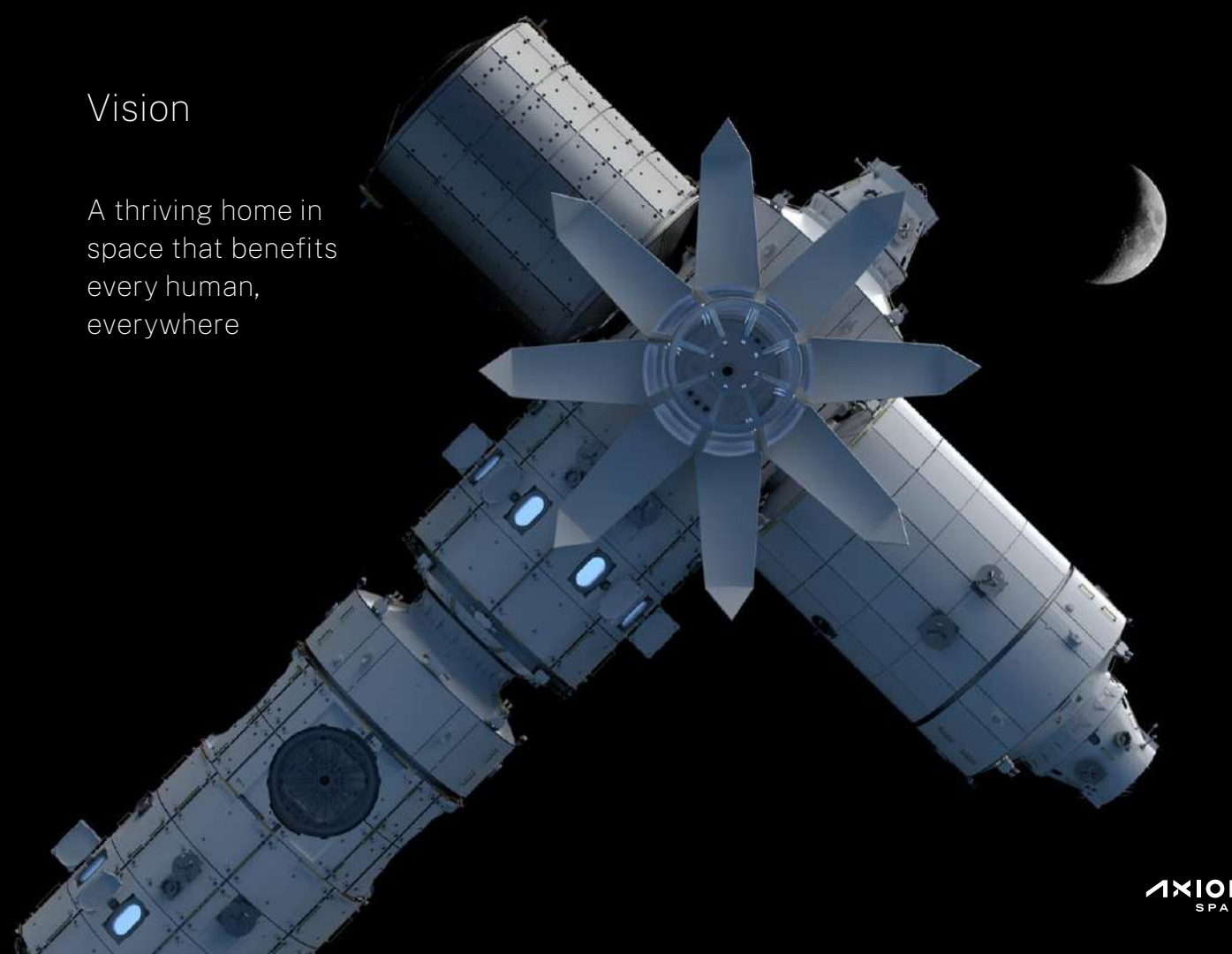
- As the ISS approaches retirement, Axiom Space builds humanity's next era-defining structure, a commercial destination off the planet that will continue to empower the advancement of civilization on Earth and beyond.

Mission

Improve life on Earth and foster possibilities beyond it by building and operating the world's first commercial space station

Vision

A thriving home in space that benefits every human, everywhere



AXIOM SPACE

PHASE
01

Expand access to LEO through Private Astronaut Missions and R&D on orbit

PHASE
02

Build Axiom Station while connected to the International Space Station (ISS)

PHASE
03

Detach from ISS and operate as an independent platform for breakthrough research & innovation

AXIOM SPACE

Ax-1

LAUNCHED APR 8, 2022

Michael López-Alegria

Ax-1 Commander

USA, Spain

Larry Connor

Ax-1 Pilot

USA

Eytan Stibbe

Ax-1 Mission Specialist

Israel

Mark Pathy

Ax-1 Mission Specialist

Canada

Ax-2

LAUNCHED MAY 21, 2023

Peggy Whitson

Ax-2 Commander

USA

John Shoffner

Ax-2 Pilot

USA

Ali Alqarni

Ax-2 Mission Specialist

Kingdom of Saudi Arabia

Rayyanah Barnawi

Ax-2 Mission Specialist

Kingdom of Saudi Arabia

Ax-3

LAUNCHED JAN 18, 2024

Michael López-Alegria

Ax-3 Commander

USA, Spain

Walter Villadei

Ax-3 Pilot

Italy

Alper Gezeravcı

Ax-3 Mission Specialist

Türkiye

Marcus Wandt

Ax-3 Mission Specialist

Sweden

PHASE 01: PRIVATE ASTRONAUT MISSIONS

Ax-1 Mission

Launched April 8, 2022

- The Ax-1 mission was a pivotal first step along the journey toward Axiom Station.
- Axiom Space and NASA's successful collaboration on the first-ever private astronaut mission to the International Space Station was an historic achievement in expanding access to low-Earth orbit (LEO).
- The Ax-1 mission was a research and STEAM (Science, Technology, Engineering, the Arts and Math) outreach-focused mission with the goal of setting the standard for future private astronaut missions.
- The success of the Ax-1 mission, which included significant scientific research and discovery, increased the return on NASA's investment in the International Space Station and the emerging LEO economy.

AXIOM SPACE


Cleveland Clinic
MAYO CLINIC
AXIOM SPACE
AXIOM SPACE
AXIOM SPACE
AXIOM SPACE

AXIOM SPACE


TO NOD1


AXIOM
SPACE

WATER MIST PFE
To JEM
PORT FWD IMV VALVE
STDB FWD IMV VALVE
Welcome Aboard!


human and robotic exploration
MCC IV HD
MCC IV HD
+1.5 h
-1.5 h
Latitude
44,1 S
Longitude
92,6 W
Altitude
271 mi
Speed
17107 mph
Time (GMT)
14 Jan 2022, 1
AXIOM
SPACE

AXIOM SPACE


Glovebox (LSG)

Ax-1 MISSION HIGHLIGHTS

- First Private Astronaut Crew
- 17 Days on the ISS
- 5 Languages Spoken
- 25 Payloads and 100+ Hours of Research
- 30 STEAM Outreach Events
- Paella and Piano Duet

Ax-1 RESEARCH PARTNERS

ARISS, aws, BioServe, Cleveland Clinic, Canadian Space Agency, JAMSS, LEAP BIOSYSTEMS, MAYO CLINIC, McGill University, mit media lab, the manfredi children's hospital foundation, RAKIA, The Ramon Foundation, OntarioTech University, The Royal Canadian Geographical Society, space applications services, STEMRAD, TECHNION Israel Institute of Technology, Translational Research Institute for Space Health, UC San Diego Sanford Stem Cell Institute, The University of British Columbia, University of Calgary, Western, ZIN Technologies

Ax-2 Mission

Launched May 21, 2023

- The Ax-2 mission was Axiom Space's second all-private astronaut mission to the ISS, marking another pivotal step toward Axiom Station, the world's first commercial space station and successor to the ISS.
- The four-person Axiom Space crew flew to space to work and live on the orbiting laboratory, implementing a full manifest of science, outreach, and commercial activities.
- Axiom Space's Director of Human Spaceflight Peggy Whitson, a former NASA astronaut and ISS commander, led the mission. Aviator John Shoffner of Knoxville, Tennessee, served as pilot. The two mission specialists were Ali Alqarni and Rayyanah Barnawi from the Kingdom of Saudi Arabia (KSA).

BUILDING THE HUMAN EXPERIENCE

PHASE 01: PRIVATE ASTRONAUT MISSIONS

Ax-2 Science

- The four-person multinational astronaut crew conducted more than 20 STEAM outreach events while aboard the space station, made possible by Axiom Space's full-service integration into the NASA process for science and technology activities onboard the ISS.
- Data collected in-flight will impact understanding of human physiology on Earth and on-orbit, as well as establish the utility of novel technologies that could be used for future human spaceflight pursuits and humankind on Earth.
- Axiom Space's partnerships offer the opportunity to expand the commercial space economy and support commercial innovations and manufacturing of biomedical products and advanced materials in LEO.

BUILDING A BETTER LIFE ON EARTH

AXIOM SPACE

Ax-2 MISSION HIGHLIGHTS

- Private and National Crew
- First Saudi Female Astronaut
- 8 Days on the ISS
- 20 STEAM Outreach Events
- DNA Nano Therapeutics and Stem Cell Research
- 8 Media Events

Ax-2 RESEARCH PARTNERS

Cedars Sinai · eascra BIOTECH · UCONN UNIVERSITY OF CONNECTICUT · UC San Diego SANFORD STEM CELL INSTITUTE · Wake Forest School of Medicine Institute for Regenerative Medicine · ReMDO · SAUDI SPACE COMMISSION · NEBULA · COSMIC SHIELDING CORPORATION · JAMSS · space exploration initiative · mit media lab · RAKIA · SPACE HEALTH · BioServe · Nanoracks · ARISS · NASA · ISS NATIONAL LABORATORY

AXIOM SPACE

PHASE 01: PRIVATE ASTRONAUT MISSIONS

Ax-3 Mission

Launched January 18, 2024

- Broke down historical, institutional barriers and redefines access to space for an entire region as the first all-European commercial astronaut mission to the ISS.
- Three countries – Italy, Türkiye, Sweden – along with the European Space Agency (ESA), had united for the mission, boldly positioning their governments and space agencies as future leaders and customers in low-Earth orbit.
- Set off a transformative effect on international collaboration in space, with the potential to foster partnerships and position European nations as pioneers of the emerging commercial space industry.

BUILDING THE HUMAN EXPERIENCE

Ax-3 MISSION HIGHLIGHTS

519 Mission Hours	18 Days on the ISS	9.1M Miles of Spaceflight	346 Orbits Around the Earth	28 Outreach Events	54 Research Activities	30+ Research Partners

Ax-3 RESEARCH PARTNERS

ARISS · Agenzia Spaziale Italiana · Barilla · Baylor College of Medicine · dallara · esa · GVM Care & Research · ISS National Laboratory · The JM Foundation · Mental Economy · NASA · NSCF · P&G · REA Space Technologies for Humans · Spacewear Astronaut Equipment · TÜBİTAK · UC San Diego Sanford Stem Cell Institute

AXIOM SPACE

PHASE 02: BUILDING AXIOM STATION

Building the World's First Commercial Space Station

Axiom Space won a full and open competition to connect Axiom Station modules to ISS, as it readies to become the first commercial space station by the time the ISS retires.

AxH1

Axiom Hab One with crew quarters and manufacturing capabilities

AxH2

Axiom Hab Two with expanded crew quarters and research capacity

AxRMF

Axiom Research and Manufacturing Facility is a state-of-the-art research and manufacturing module

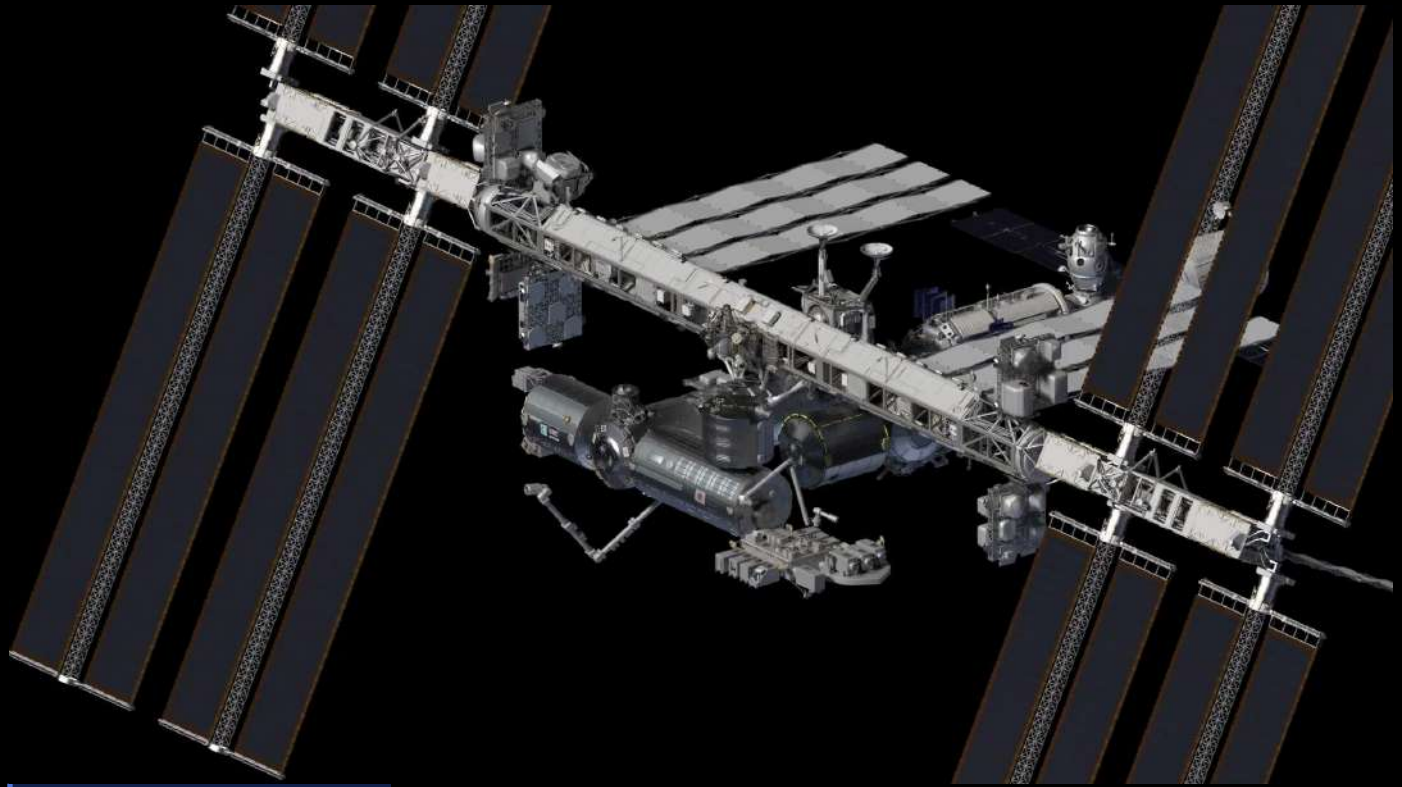
AxPTM

Axiom Power Thermal Module with an expanded environmental, life support, storage and payload capabilities

Axiom Station

Axiom Station is a self-sustaining orbital platform that has pressurized and unpressurized payload capacity comparable to the ISS

AXIOM SPACE



BUILDING FOR BEYOND

AXIOM SPACE

Module Construction is Underway

Module Construction is Underway

PHASE 03: FREE-FLYING AXIOM STATION

Independent Free-Flying Commercial Space Station to Support Customers Around the World

- Prior to the planned decommissioning of the ISS by 2031, the Axiom Station segment will detach from the ISS and form the first-ever, free-flying independent commercial space station.
- The Axiom Station will sustain and expand life and work on orbit for international governments, private industries, and individuals around the world.
- The Axiom Space platform will offer opportunities to support microgravity research and manufacturing in LEO.

BUILDING PROSPERITY THROUGH OPPORTUNITY

AXIOM SPACE

AXIOM EXTRAVEHICULAR MOBILITY UNIT (AxEMU)

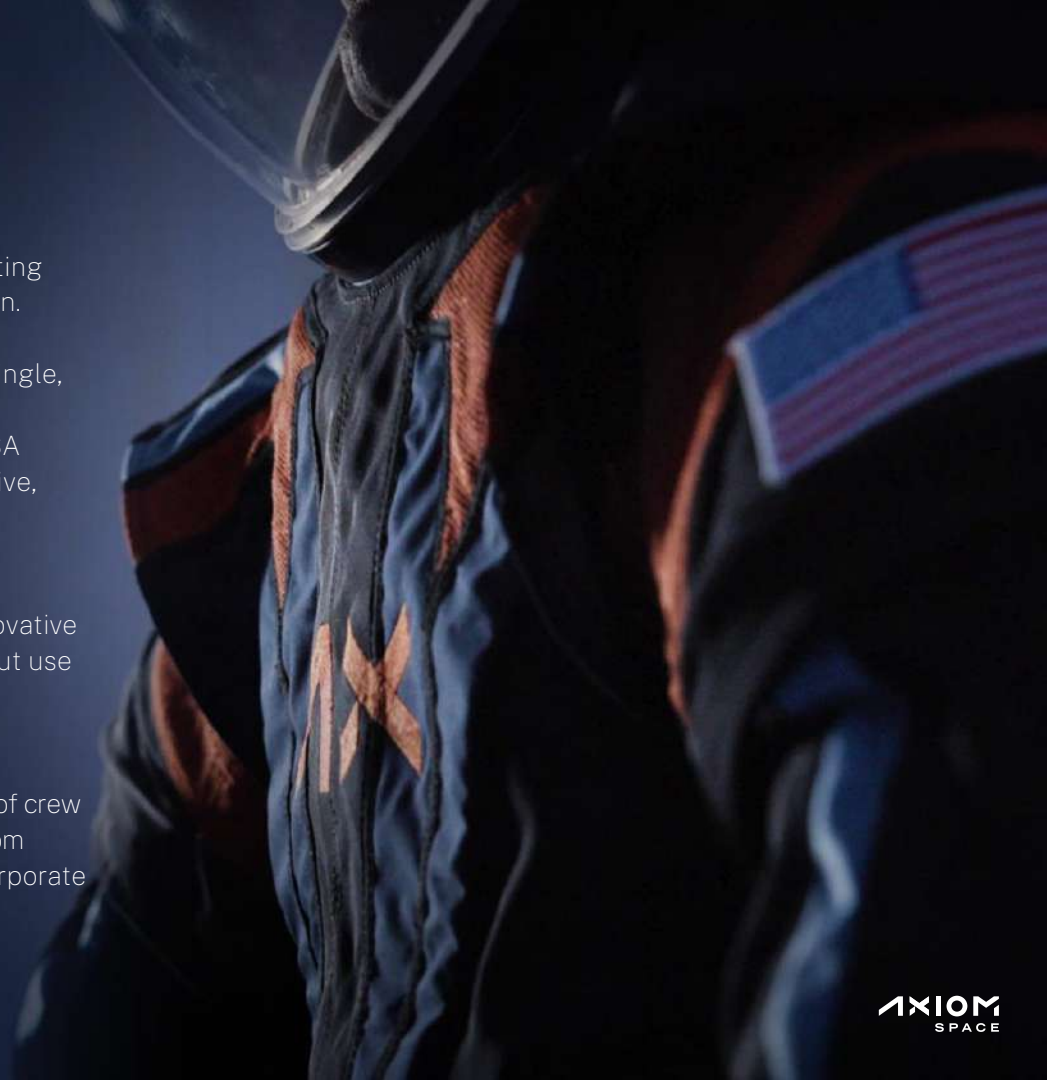
Lunar and LEO Spacesuits

- Axiom Space is building two spacesuits in parallel: one supporting the Artemis III lunar mission, and one supporting spacewalking in LEO for the ISS and the future Axiom Station.

- The new spacesuits by Axiom Space are being built from a single, foundational architecture that will provide astronauts with advanced capabilities for space exploration and provide NASA commercially developed human systems needed to access, live, and work in microgravity as well as on and around the Moon.

- These next-generation evolvable spacesuits will replace the forty-plus year-old suits currently in use on the ISS, with innovative solutions that will also provide capabilities to enable astronaut use for future spacewalking in LEO and surface activities on the lunar surface.

- Axiom Space's AxEMU spacesuits accommodate a wide range of crew members. Building off NASA's xEMU spacesuit design, the Axiom Space suits are built to provide increased flexibility and incorporate specialized tools to accomplish exploration needs and expand scientific opportunities in space.



AXIOM SPACE

AxEMU Spacesuit Highlights

In-Helmet Radio & Communications

Various communication devices and redundant UHF radios are used to make sure astronauts always have communication with each other and teams on the ground.

Portable Life Support System

The PLSS backpack provides everything needed to keep astronauts alive during EVAs. The PLSS contains many items such as batteries, water pumps, oxygen tanks, fans, and many other components.

Axiom EVA Gloves

The gloves enable the astronaut to use many EVA tools, endure extreme temperatures, and incorporate many new innovative features including the ability to customize the glove fit to each astronaut.

Helmet and Visor

The AxEMU visor provides protection against the sun's harmful UV rays. The helmet provides impact protection and has attached lights and HD video cameras that transmit exactly what the astronauts see during their EVA back to Mission Control.

Spacesuit Cover Layers

Custom made cover layers are used for any on-ground exhibits or appearances to protect the spacesuits and Axiom Space's intellectual property integrated within the spacesuit.*

AxEMU Moon Boots

The AxEMU boots are specifically designed for walking on the lunar surface, which can be as cold as -288°C (-397°F). These boots have advanced insulation and inserts that help keep astronauts' feet warm and comfortable.

*Current design by Esther Marquis, Costume Designer for 'For All Mankind' , 'Shang-Chi and the Legend of the Ten Rings', and much more

BUILDING FOR BEYOND


AXIOM
SPACE
Building for Beyond
@Axiom_Space
@Axiom-Space
@axiom.space
@Axiom Space