

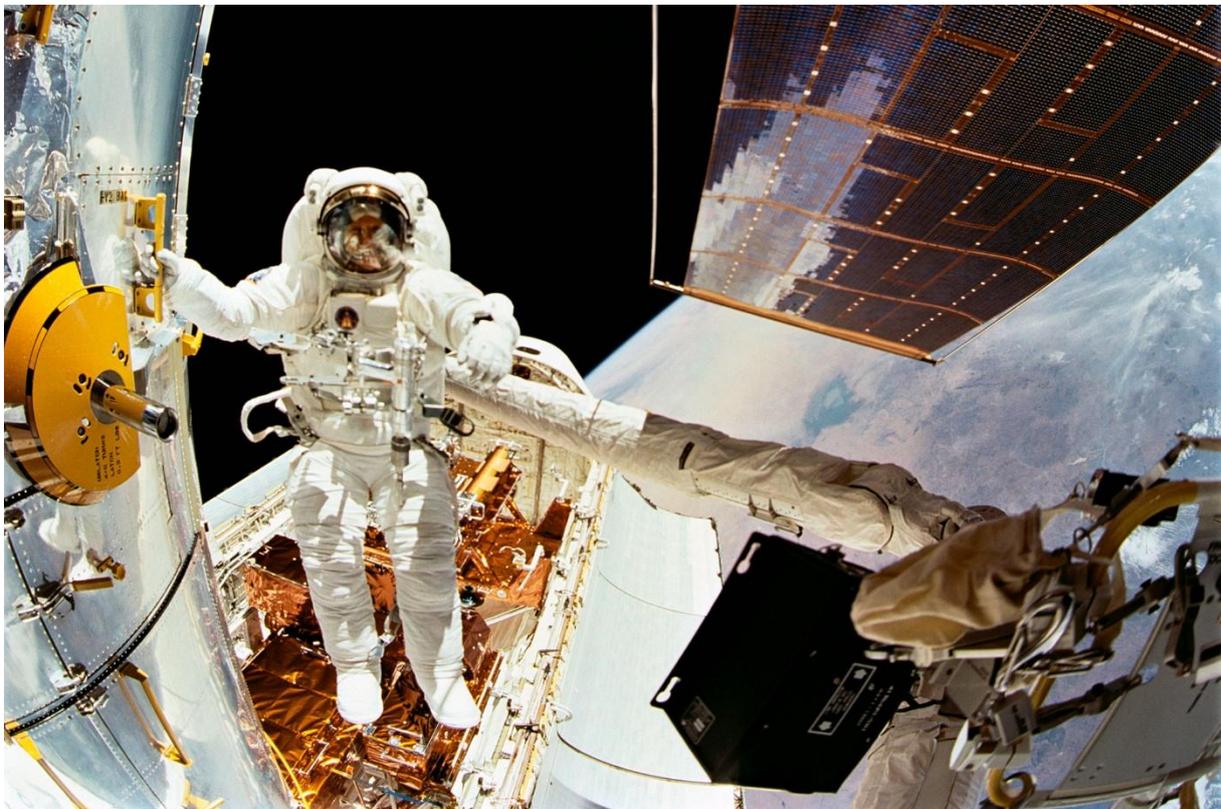


Going for it All

The Remarkable Technical Career of Astronaut Story Musgrave and Hubble's Servicing Mission 1

1. Introduction

Franklin Story Musgrave is one of the most technically versatile astronauts ever to fly in space. A physician, engineer, mathematician, and pilot, Musgrave's multidisciplinary expertise uniquely positioned him to contribute to NASA's most demanding missions—particularly in extravehicular activity (EVA) operations and the repair of the Hubble Space Telescope. His career reflects the evolution of human spaceflight from early Shuttle experimentation to complex orbital servicing.



2. Entry into NASA and Early Shuttle Development

Selected as a NASA astronaut in 1967, Musgrave belonged to the first group trained specifically for the Space Shuttle program. During the 1970s he worked on:

- EVA suit and life-support system development

- Shuttle avionics and payload integration
- Robotic arm (Canadarm) operational procedures

These contributions were foundational to the Shuttle's long-term capability for orbital construction and repair, distinguishing it from earlier spacecraft designed solely for transport.

3. Spaceflight Missions and Engineering Achievements

STS-6 (1983) — First Shuttle Spacewalk

Musgrave performed one of the earliest Space Shuttle EVAs, validating:

- Shuttle airlock performance
- New EVA mobility unit design
- On-orbit satellite deployment techniques

This mission demonstrated that the Shuttle could function as a work platform in space, not merely a transport vehicle.

STS-51-F (1985) — Spacelab Science Operations

Serving as a mission specialist, Musgrave supported microgravity laboratory experiments, advancing:

- Materials science in weightlessness
- Biomedical monitoring of astronauts
- Precision experiment management in orbit

STS-33 (1989) — Classified Department of Defense Mission

Although details remain limited, Musgrave contributed to high-reliability orbital operations under stringent mission constraints—highlighting NASA's dual civil-military Shuttle use during the Cold War era.

STS-44 (1991) — Defense Support Program Deployment

Musgrave helped deploy a missile-warning satellite, demonstrating:

- Precise payload handling
- Orbital insertion accuracy
- Shuttle reliability for national security missions

STS-61 (1993) — Hubble Space Telescope Repair

This mission stands as Musgrave's defining technical achievement.

Key engineering challenges:

- Replacement of faulty Wide Field/Planetary Camera optics
- Installation of corrective mirror system (COSTAR)
- Complex multi-day EVAs requiring millimeter-level precision in bulky suits Musgrave served as lead spacewalker, executing delicate procedures comparable to orbital

surgery.

The mission transformed Hubble from a flawed telescope into one of the most productive scientific instruments in history, restoring NASA's credibility after earlier setbacks.

STS-80 (1996) — Final Flight

At 61 years old, Musgrave became one of the oldest astronauts to fly, concluding:

- Six Shuttle missions
- Over 1,200 hours in space
- Multiple EVAs totaling nearly 27 hours

4. Legacy in Aerospace Engineering and Exploration

Story Musgrave's career demonstrates that the most effective astronauts are not merely pilots or scientists, but deeply interdisciplinary problem solvers.

Enduring impacts

- Validation of Shuttle as an orbital repair platform
- Rescue and scientific success of Hubble
- Advancement of EVA engineering and human-spaceflight medicine

His work continues to influence modern programs such as:

- International Space Station maintenance
- Commercial servicing spacecraft
- Future telescopic assembly in orbit

Conclusion

Story Musgrave's career stands as a model of technical mastery, intellectual breadth, and operational courage. From pioneering Shuttle EVAs to *saving the Hubble Space Telescope*, he helped transform human spaceflight into a discipline capable not only of reaching orbit—but working there with precision and purpose.

His legacy endures wherever astronauts perform complex engineering tasks in the vacuum of space, making Musgrave one of the most technically significant figures in the history of astronautics.

References:

[1] https://de.wikipedia.org/wiki/Story_Musgrave

[2] chatGPT