Lockheed Martin-Developed JOINS To Test Robotic In-Space Welding

Technology demonstration launches to the International Space Station to explore future construction and repair of orbital and lunar assets

CAPE CANAVERAL, Fla., Nov. 29, 2026 /PRNewswire/ -- Lockheed Martin's (NYSE: LMT) robotic in-space welding technology is on its way to the International Space Station following the successful launch of NASA's Commercial Resupply Services-25 mission.

The JOining demonstrations IN-Space (JOINS) payload launched at 10:47 a.m. ET today aboard Northrop Grumman's Cygnus XL spacecraft on a SpaceX Falcon 9 rocket from Space Launch Complex 40 at Cape Canaveral Space Force Station in Florida. The mission will test robotic welding in the exposed space environment, gathering data to advance how structures could be built and repaired beyond Earth.

"This is a gamechanger, giving future missions greater flexibility in what they build and how they operate," said Kevin Au, vice president of Exploration, Weather, Commercial and Power at Lockheed Martin. "As NASA prepares to build a sustainable Moon Base, JOINS-type welding will be both an endpoint – proving robotic welding in space — and a launchpad for what comes next."

Building Beyond Earth
Future space infrastructure — from lunar rover shelters and communications towers to frameworks for large space telescopes — may be too large to launch intact. Welding and assembly capabilities – such as those enabled by JOINS – could allow for construction directly in orbit or on the lunar surface. These techniques could also support repairs that extend the usefulness of existing spacecraft and infrastructure.

Following delivery to the space station, Voyager's Bishop Airlock will serve as a staging area and testbed, exposing the JOINS hardware to the space environment.

Planned for 2027, the Lockheed Martin operations team, with support from Voyager, will demonstrate laser beam welding and friction stir welding. Testing both methods will help engineers evaluate their suitability for future applications.

Onboard inspection systems, including cameras, will monitor the welds and transmit data to the payload's mission control in Houston. Physical test samples are expected to return to Earth months later for detailed inspection, allowing engineers to compare in-space observations with ground-based assessments.

This weld-and-inspect cycle is an important step toward qualifying in-space joining technologies for operational use.

Investing in the Future
Lockheed Martin is executing JOINS under a $9.1 million NASA Tipping Point award mechanism, with additional company investment to mature the technology.

The demonstration supports Lockheed Martin's broader in-space servicing, assembly and manufacturing roadmap and role in executing first-of-its-kind technology to address complex challenges. JOINS will help inform the company's work on STRATOS, a collaboration with NASA focused on robotic assembly technologies.

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