FLIGHT OPPORTUNITIES

ISSUE 87 — DECEMBER 2025

COMMUNITY OF PRACTICE WEBINAR

January 7 Webinar: Sensor-Fusion Flight Test: A Case Study with Exploration Potential

Wed. January 7, 2026 • 10-11am PT

This session will explore the unique aspects of testing a suite of Earth observation sensors as well as how these technologies might be leveraged for planetary exploration. On April 23, 2025, a **payload of three technologies** designed to autonomously detect wildland fires from the stratosphere flew aboard an Aerostar International high-altitude balloon for eight hours over several contained and controlled burns.

In this webinar moderated by Flight Opportunities personnel, researchers will discuss how they fused the data from the three balloon-based sensing technologies along with data from a drone-based sensor to obtain a comprehensive understanding of fires on the ground. The session will cover the opportunities and lessons learned in collaborating across sectors — from academia to industry and small business to the government — as well as what's next for the technologies.

Flying over several contained and controlled burns on April 23, 2025, an Aerostar high-altitude balloon carried three technologies designed to enable detection of wildland fires from the stratosphere. Credit: NASA

Learn about our Jan. 7 webinar

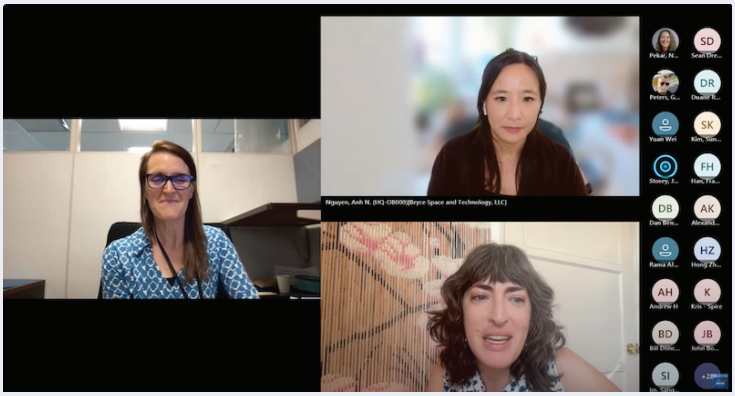
COMMUNITY OF PRACTICE WEBINAR

ON-DEMAND WEBINARS

Watch any of our past webinars on demand!

These webinars share best practices and important lessons learned from suborbital and orbital researchers, flight providers, and NASA personnel experienced in using flight tests to advance technologies.

Our September 3, 2025, webinar is now available: Exploring Hosted Orbital Capabilities with NASA's Flight Opportunities Program



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PAYLOAD PROFILE

NASA's Fly Foundational Robots (FFR) Demo to Bolster In-Space Infrastructure

Motiv Space Systems

The goal of the FFR mission to provide a critical capability for sustainably living and working on other planets. With support from **SBIR (Small Business Innovation Research)**, Motiv Space Systems has developed a robotic arm capable of dexterous manipulation, autonomous tool use, and walking across spacecraft structures in zero or partial gravity.

This robotic technology aims to enable ways to repair and refuel spacecraft, construct habitats and infrastructure in space, maintain life support systems on lunar and Martian surfaces, and serve as robotic assistants to astronauts during extended missions. Advancing robotic systems in space could also enhance our understanding of similar technologies on Earth across industries including construction, medicine, and transportation.

Flight Opportunities is supporting the in-space demonstration of Motiv's robotic arm on a hosted orbital mission with Astro Digital scheduled to launch in late 2027.

Artist concept of the FFR Mission's robotic system payload atop the Astro Digital spacecraft. The robotic arm, provided by Motiv Space Systems, will perform robotic demonstrations in orbit. Credit: Motiv Space Systems

Read about the FFR demonstration

OPPORTUNITIES

LunaRecycle Challenge Phase 2

Registration closes Jan. 22, 2026

NASA is accepting U.S. submissions for the second phase of its LunaRecycle Challenge, a competition focused on the development of solutions that can transform trash items into useful feedstocks and/or end products on the surface of the Moon and Mars. **Phase 2 is a $2 million competition.**

Learn about LunaRecycle

IN THE NEWS

NASA-Supported University Projects Broaden Small Satellite Technology

A recent *USA Today* feature highlighted how NASA's **University SmallSat Technology Partnership (USTP)** initiative is helping university researchers redefine what's possible with the next generation of SmallSats and CubeSats. As part of NASA's **Small Spacecraft & Distributed Systems (SSDS)** program, USTP has provided more than $30 million to projects across 36 universities since 2013, accelerating innovations with strong potential for future NASA missions.

NASA's Starling six-month mission will use a team of four CubeSats in low-Earth orbit to test technologies that let spacecraft operate in a synchronized manner without resources from the ground. Credit: NASA/Ross Walter

The article featured comments from **Christopher Baker**, SST's program executive, who noted that small spacecraft have rapidly evolved from academic tools into a thriving sector launching thousands of spacecraft each year. They also have achieved mission objectives at significantly lower risk and cost than using traditional spacecraft.

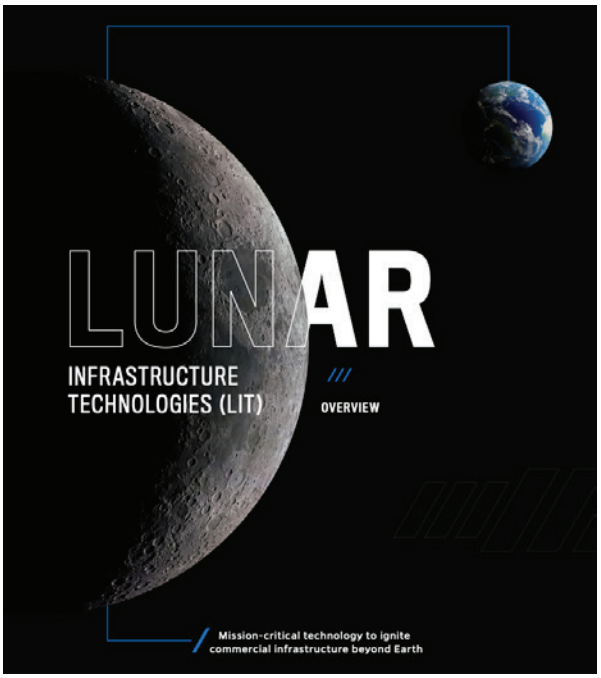
Working with academic partners not only lowers NASA's risk and cost for advancing key mission objectives but also strengthens the pipeline of future Innovators. **Danielle McCulloch**, program executive for Flight Opportunities, emphasized that SmallSat technology has grown into a "fundamental part of the space industry," with much of its momentum driven by NASA's strategy of harnessing university researchers' early-stage, innovative thinking through sustained partnerships.

University teams featured in the story — including researchers at Stanford, MIT, and the University of Texas at Austin — are developing technologies ranging from precision swarm navigation and distributed space systems to efficient electronic propulsion and vision-based autonomous navigation.

Read the USA Today article

RESOURCES

NASA Launches New Lunar Infrastructure Technologies Campaign



Mission-critical technology to ignite commercial infrastructure beyond Earth

At the 2025 **Lunar Surface Innovation Consortium (LSIC)** spring meeting, NASA's Space Technology Mission Directorate announced that NASA and the Johns Hopkins University Applied Physics Laboratory (APL) are developing a mission-driven framework that leverages the commercial lunar technology community to achieve minimum viable infrastructure on the lunar surface.

This Lunar Infrastructure Technology (LIT) campaign is a cost-efficient, readily executable series of missions to enable continuous operations on the Moon — for the first-ever Moon base — with extensibility to Mars. The campaign is focused on infrastructure that will enable expanded operations such as in situ resource utilization and fission surface power. Relying on existing and near-term technologies, LIT prioritizes rapid delivery, deployment, and use of the fundamental lunar infrastructure needed to commercialize and innovate.

Read the LIT study overview

LEARN WITH NASA

Nearly 800 TechRise applications were received from 53 states and territories!

Thank you for helping us spread the word.

Watch for the announcement of winners in January and the flights in summer 2026.

UPCOMING EVENTS

Attending any of these upcoming meetings? Let us know!

- **AGU25 (American Geophysical Union)**
  Dec. 15-19 | New Orleans, LA
  Attend Danielle McCulloch's panel, "Commercial Services for Space Science Missions"
  —Wed. Dec. 17 from 6:00-7:00 pm (CT)
  —Session #TH35L
  —Room: New Orleans Theater B

- **AIAA SciTech Forum**
  Jan. 12-16 | Orlando, FL

NASA Flight Opportunities Program

Flight Opportunities is part of NASA's Space Technology Mission Directorate.

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