

Flight Opportunities

ISSUE: 75 | September 2024

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Enjoy!
The Flight Opportunities team

Hands-on Testing During Suborbital Rocket Flight

On August 29, **two technology payloads** supported by Flight Opportunities flew aboard Blue Origin's New Shepard — one of which represented the first time a NASA-funded researcher flew with their payload on a suborbital rocket.

One payload was a University of Florida technology that helps researchers understand the biological effects of changes in gravity by analyzing patterns of gene expression in plant samples. Principal investigator Robert Ferl conducted this experiment himself.

The other payload had new TPS (thermal protection system) materials developed by the small business HeetShield of Flagstaff, Arizona. Mounted to the outside of New Shepard's propulsion module, the TPS materials were exposed to spaceflight and reentry conditions, enabling the company to gather insights about how the materials withstood the rigors of launch and descent ahead of future mission applications.



University of Florida's Rob Ferl conducted a hands-on biological experiment during suborbital flight. Credits: Blue Origin

Fly-Fix-Fly at Work During Parabolic Flight Testing

A three-day parabolic flight campaign in Santa Maria, California, conducted by Zero Gravity Corporation, tested a half-dozen technology payloads from NASA, the University of Florida, and the University of California, Davis. Many of these payloads previously flew on parabolic flights, enabling the researchers to advance their technologies based on those findings and retest.

One of the technologies aboard was a laser-welding technology from NASA's Marshall Space Flight Center. The team performed high-power fiber laser beam welding under high vacuum and micro- and lunar gravity conditions, which provided a validation dataset that will anchor computational models. The goal is to enable one-shot critical laser beam welds in space and on the lunar surface for the manufacturing, assembly, and repair needed for long-term sustainability between the Earth, Moon, and Mars. TechLeap Nighttime



(L to R) Dr. Andrew O'Connor and Dr. Louise Little of NASA Marshall along with Ohio State Univ. Ph.D. student Aaron Brimmer monitor laser beam welding occurring within a vacuum chamber in reduced gravity. Credits: Zero Gravity Corporation

[Learn more about other payloads tested on the parabolic flights](#)

Precision Landing flight update

The second flight test campaign in the NASA TechLeap Prize's **Nighttime Precision Landing Challenge** took place around 10:00 p.m. PDT on September 5 in Mojave, CA. The three teams participating in the challenge each have the opportunity to test their technologies designed to aid landing in dark or permanently shadowed regions of the Moon aboard flights of Astrobotic's Xodiac rocket-powered lander.

The LITTLE OWL (Low SWAP-C Nighttime Landing Hazard Detection System) integrated sensing system developed by winner Falcon ExoDynamics is designed to perform sensing of terrain in the dark from an altitude of 400 meters and higher to help identify hazards and safe landing sites for spacecraft. LITTLE OWL employs a photogrammetry device that uses the motion of the observing platform to produce very long baseline stereoscopic images in lit and unlit conditions. Visit the webpage to [learn more about this TechLeap challenge](#).

Community of Practice Webinar

Spotlight on In-Space 3D Printing and the Value of the Flight Test

Wednesday, October 2, 2024
10:00-11:00 a.m. PST

Join the October 2 webinar to learn about a new 3D printing technology that flew aboard Virgin Galactic's VSS Unity as part of the **Galactic 7 flight test** in June 2024.

The payload from University of California, Berkeley tested a multi-material manufacturing technique known as computed axial lithography. Rather than printing in layers, this device uses light to solidify liquid and gel materials in a single step in microgravity.

Future uses could range from printing spare parts for spacecraft to addressing medical-related issues during long-duration missions — all necessary to enable future long-duration space missions for NASA and the nation.

Through a conversation moderated by the Flight Opportunities team, representatives from UC Berkeley and Virgin Galactic will present the technology, discuss how the reusable suborbital spaceship provided the research team with conditions needed to evaluate the 3D printer's in-space performance, and explore lessons learned during the flight test as well as what's next.



Researchers from the University of California, Berkeley prepare their 3D printer for a June 8, 2024, suborbital flight test aboard VSS Unity. Credits: University of California, Berkeley

[Learn more about our Oct. 2 webinar](#)

Inspire the Next Generation: Be a TechRise Student Challenge Judge

Do you or your colleagues have expertise in engineering, space, and/or atmospheric research? NASA is looking for volunteer judges for the 2024-25 TechRise Student Challenge! Volunteers must be willing to offer approximately five hours of time to review proposals for experiments flying on a high-altitude balloon. The judging period runs approximately Nov. 4–19, 2024.



TechRise is open to students in grades six to 12 attending U.S. public, private, or charter schools, including those in U.S. territories. It offers participants hands-on insight into the payload design and suborbital flight test process, with the goal of inspiring a deeper understanding of space exploration, Earth observation, coding, electronics, and the value of test data.

[Register to be a TechRise judge](#)

Lessons from the Launchpad

The Basics of Getting Ready to Fly

During our past [Community of Practice webinars](#), researchers have shared their insights on basic best practices when getting ready for flight. Consider the following:

- **Cultivate a successful team:** Choose team members you trust and work well with and who can contribute in specific ways that add value to the flight-testing effort. » [Hear more about choosing team members.](#)
- **Reach out early:** Communicate with your flight provider, NASA flight campaign manager, and other team members early and often to resolve questions and best prepare for your flight. » [Hear more about reaching out early.](#)
- **Stay organized:** Make organization a priority for you and your team every step of the way as you prepare for your flight. For example, create and follow procedures/checklists and ensure that you have the user's guides and documentation you need. » [Hear more about staying organized.](#)
- **Have contingencies for your experiment:** Consider everything that could go wrong with your technology as well as the demonstration itself and plan for how to solve it. For example, if software is automated, make sure you have the option to override it. If a team member gets sick, ensure you have a back-up person in place. » [Hear more about having contingencies.](#)

More tips to help with [getting ready for flight](#) are available in our Lessons Learned Library.

[Access and download the entire Lessons Learned Library](#)

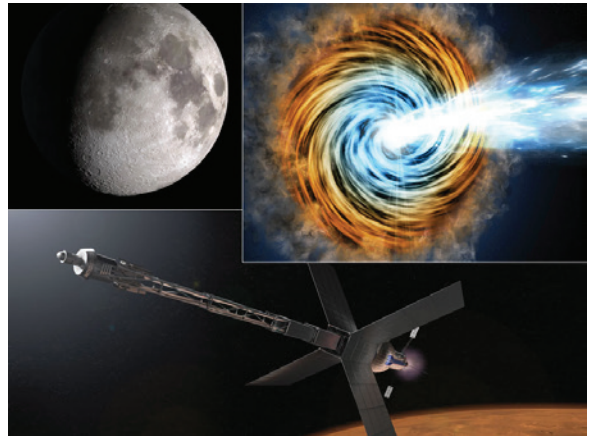
Opportunities

Apply by Nov. 1 for NASA Space Technology Graduate Research Opportunities (NSTGRO25)

NSTGRO25 calls for space technology proposals in relevant disciplines from graduate students at accredited U.S. universities. Designed to fund research focused on creating innovative new space technologies for our Nation's science, exploration, and economic future, **this fellowship opportunity** has a deadline of 6 PM ET on November 1, 2024.

Selected fellows perform research at their own campus and at NASA centers, collaborating with a technically relevant NASA researcher. These collaborations enable graduate students to pursue broader and/or deeper research opportunities, gain a more detailed understanding of potential applications of their research, and directly disseminate their research results within the NASA community. Awards are planned to coincide with the start of the 2025-2026 academic year.

Detailed submission instructions are provided under "Other Documents" **on the solicitation's NSPIRES webpage**. Questions? Email HQ-NSTGRO-Call@mail.nasa.gov.



Events

SmallSat Education Conference

Oct. 26-27 • NASA's Kennedy Space Center, Florida

This gathering for educators, administrators, and students to learn about CubeSats, ThinSats, and high-altitude balloon programs provides hands-on opportunities for educators and students of all ages to learn how they may "go to space" within four session tracks: Systems Engineering and Mission Management, Science Missions and Payloads, High Altitude Balloon/SmallSat Education, and Advanced Technologies/Techniques. Times for networking are built into the conference schedule.



Lunar Surface Innovation Consortium (LSIC) Fall Meeting

Nov. 13-15 • Las Vegas, Nevada

LSIC's goal is to harness the creativity, energy, and resources of the nation to help NASA keep the United States at the forefront of lunar exploration. The fall meeting — held at the University of Nevada, Las Vegas — will focus on technology testing, lunar proving grounds, and how the community can partner to get to the Moon together. LSIC invites the community to submit abstracts by October 4 on topics pertaining to LSIC's focus areas, particularly concerning testing technologies and lunar proving grounds. Further details about submitting abstracts are on **the meeting webpage**.

American Society for Gravitational and Space Research (ASGSR) Conference

Dec. 3-7, 2024 • San Juan, Puerto Rico

The **ASGSR annual meeting** brings together the biological and physical space sciences community to share research, build collaborations, and discuss emerging issues in the field. ASGSR welcomes scientists and engineers from all career stages. Members of the Flight Opportunities program will facilitate a panel about the program and researcher experiences.

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