

Flight Opportunities

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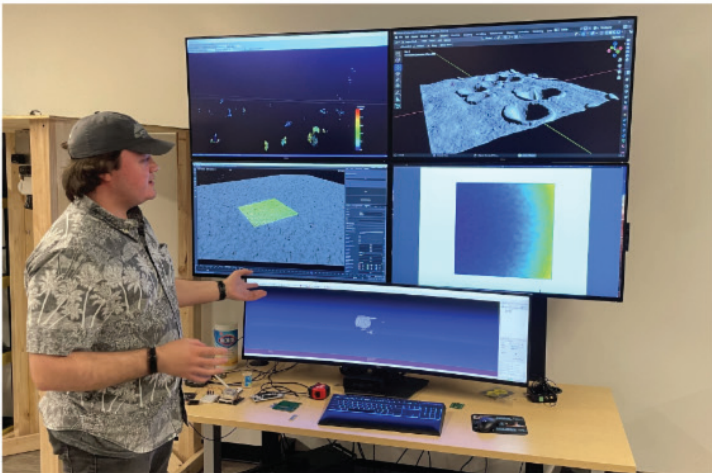
- Next-Generation Suborbital Researchers Conference: Feb. 27 – Mar. 1, 2023

Enjoy!
The Flight Opportunities team

Winners of NASA's TechLeap Prize: Nighttime Precision Landing Challenge No. 1 Advance to Next Round

After receiving an initial \$200,000 to begin designing and building technology payloads, all three winners of the **NASA TechLeap Prize: Nighttime Precision Landing Challenge No. 1** have successfully completed **Payload Build Round 1**. The teams were challenged to build low-cost sensing systems that can map terrain in the dark from an altitude of 250 meters or higher. Such technology will be critical for future space exploration, which will require spacecraft of various sizes to land routinely and precisely in challenging terrain, such as undulations and steep slopes that contribute to the permanently shadowed areas of the Moon's cratered surface.

The winning teams – Bronco Space Lab at Cal Poly in Pomona, California; Falcon ExoDynamics of El Segundo, California; and University of South Florida's Institute of Applied Engineering in Tampa – each received additional awards of \$200,000 and advancement to **Payload Build Round 2**. Field judges from Flight Opportunities conducted on-site visits in November to review each winner's progress and provide input. A second round of site visits is planned for March 2023 in advance of suborbital testing for the teams' technologies.



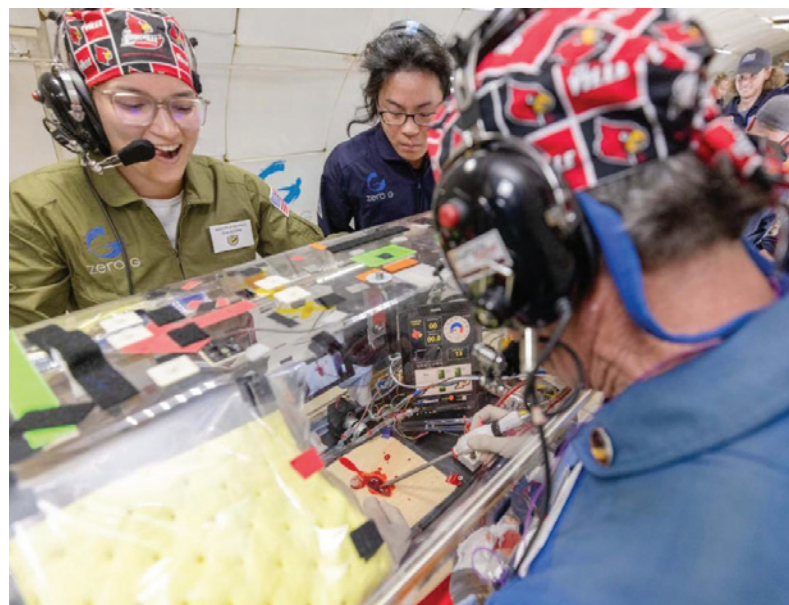
Members of the winning teams for NASA's TechLeap Prize: Nighttime Precision Landing Challenge No. 1 – (top) Bronco Space Lab, (bottom left) University of South Florida, (bottom right) Falcon ExoDynamics – present the progress on their payload builds for innovations designed to aid landings in the dark and shadowed areas of the lunar surface. Credits: NASA

Parabolic Flights Help Advance Space-Based Surgery, Health Monitoring Technologies, and More

As humans venture further into space and for longer periods of time, medical issues may become more common — and taking a trip back to Earth to treat them less likely. Technologies designed to address such issues were among the Flight Opportunities-supported innovations tested in November on parabolic flights provided by Zero Gravity Corporation's G-FORCE ONE aircraft. The flights also provided testing for technologies designed to facilitate biological research; advance modeling and management of cryogenic fluids; provide affordable advances in attitude control for CubeSats; additively manufacture biomaterials and engineering components; and leverage the surface tension of liquids for potential future telescope applications. [Read the full NASA feature article](#) to learn more.



Graduate students Zach Estlack (left, University of Utah) and Matin Golozar (University of California — Berkeley) load the “Lab on a Chip” with samples to perform analyses of amino acid biomarkers in zero gravity. Credits: Zero Gravity Corporation/Steve Boxall



Researchers from University of Louisville and Purdue University tested the latest advancements in a space-based surgical system designed to contain blood and fluids and provide medical suction and other functions. Credits: University of Louisville, Cornell University

Opportunities

Now Open

Request for Information: Commercially Enabled Rapid Space Science

NASA's Biological and Physical Sciences Division (BPSD), in support of a proposed initiative for Commercially Enabled Rapid Space Science (CERISS), is soliciting information under a Request for Information (RFI) to determine interest from the science community in utilization of in-situ analysis capabilities, sample or experiment preparation techniques, and other research hardware for crew-tended microgravity investigations.

[Read the full RFI.](#)

Responses due: March 31, 2023

NLRA 2023-1: Technology Advancement and Applied Research Leveraging the ISS National Lab

This ISS National Lab Research Announcement (NLRA) solicits proposals focused on flight investigations within applied research and development, translational medicine, technology readiness level maturation, and technology demonstrations to be performed on the International Space Station. Funding aims to enable mission integration and operations support for projects that will be implemented on the station.

[Learn more about NLRA 2023-1.](#)

Concept summaries due: January 10, 2023

Full proposals (by invitation) due: March 15, 2023

Plan Ahead for TechFlights 2023

NASA's next **TechFlights solicitation** is expected to be released in early 2023. There are several steps you can take to plan ahead if you are interested in proposing a technology payload for flight testing supported by TechFlights:

Read the TechFlights 2022 solicitation.

While specifics vary year to year, previous solicitations will give you a general understanding of the funding available via TechFlights, as well as the proposal and selection process.

Register on NSPIRES and on **SAM.gov** if you have not done so already. Completing these steps well in advance will save you much-needed time when the solicitation is released to focus your efforts on **crafting a strong proposal**.

Download and share the TechFlights infographic (right) with your colleagues.

Post to your socials, circulate to your networks, and let the smart innovators in your circle know: they should apply! Join Us For the January Webinar

National Aeronautics and Space Administration

NASA TECHFLIGHTS

Advancing Technologies Through Access to Suborbital and Orbital Flight Tests

Whether you're developing technology for the Moon, Mars, the International Space Station, or a small spacecraft, putting it to the test in a relevant environment is essential to advancing its maturity. NASA TechFlights can help you access flight tests for your technology on commercial suborbital or orbital vehicles.

How much funding is available?

- Previous awards have been up to \$750K per awardee
- No cost sharing is required

Who is eligible to apply?

U.S.-based* researchers from:

- Industry
- Academia
- Private research institutes

*Non-U.S.-based organizations may be eligible to collaborate with a U.S.-based principal investigator.

What does it cover?

- Purchase of flight tests on a suborbital vehicle or hosted on an orbital platform that best suits your technology demonstration needs
- Design, development, and preparation of your technology payload for flight
- Travel, educational opportunities, and other indirect costs

How are proposals evaluated?

NASA evaluates all proposals based on technical merit and utilizes dual-anonymous peer review (DAPR) to reduce the impacts of unconscious bias. Relevance to NASA missions and/or commercial spaceflight are considered in the evaluation as well as the soundness of the technology development and flight test plans, among other factors.

How do I get started?

- 1 Register on www.SAM.gov (a prerequisite for registering on NSPIRES)
- 2 Register on NASA NSPIRES to access all materials and create your proposal: <https://nspires.nasagrs.com>

What kinds of vehicles can I test my technology on?

Researchers may select any commercial flight vehicle that meets NASA's technical requirements, including:

- Aircraft flying parabolic profiles
- Rocket-based systems
- High-altitude balloons
- Hosted commercial orbital platforms, facilitated in partnership with NASA's Small Spacecraft Technology program

How can I learn more?

- [Subscribe](#) to the Flight Opportunities newsletter to get the latest news and updates on upcoming solicitations. ▶
- Contact us at: nasa-flightopportunities@mail.nasa.gov

www.nasa.gov/flightopportunities

Join Us For the January Webinar

Advancing NASA Technology Priorities: Cryogenic Fluid Management

Suborbital flight tests through NASA's Flight Opportunities program can be used to advance technologies with a wide range of applications. The **strategic framework** developed by NASA's Space Technology Mission Directorate (STMD) names cryogenic fluid management as a key technology need for long-duration space missions. Join representatives from Flight Opportunities and NASA subject matter experts to discuss how suborbital demonstrations can support efficient technology advancement. This session will also include the perspective of Flight Opportunities-supported researchers to illustrate best practices for flight testing technologies with NASA priorities in mind.

Wednesday, January 4, 2022

10:00 a.m. - 11:00 a.m. PST

Join on your computer or mobile app

Microsoft Teams meeting

[Click here to join the meeting](#)

Or call in (audio only)

+1 256-715-9946

Phone Conference ID: 698 328 271#

Do you have ideas or suggestions for a future Community of Practice topic? We'd love to hear your thoughts. Email us at NASA-FlightOpportunities@mail.nasa.gov to tell us what you'd like to see.

Resources

Flight Opportunities FY2022 Accomplishments Report

The Flight Opportunities Fiscal Year 2022 Accomplishments Report is now available online. Read more about the program-supported technologies that flew, support for new launch capabilities, technologies that have transitioned to orbital missions, innovations selected for future suborbital flight testing, key program metrics and milestones, and more.

[Download the report.](#)



Draper Technologies Selected for Field Testing and Future Lunar Mission

The Technology: Draper Multi-Environment Navigator (DMEN)

This vision-aided navigation system is designed to enable spacecraft to successfully execute a landing on the Moon or Mars.

Why It Matters

Navigation is challenging in environments where GPS or radio signals aren't available. By identifying land features in real time, the DMEN can improve a lander's knowledge of where it is and where there is a safe place to touch down — both critical for landing on the Moon or Mars.

Suborbital Flight Milestones

Draper has leveraged several Flight Opportunities-supported flights to ensure the system can successfully execute entry, descent, and landing (EDL).

- September 2019: Tested performance on Masten Space Systems' Xodiac vertical takeoff vertical landing system to demonstrate the technology's ability to identify land features in real time and characterize navigation performance.
- April and September, 2019: Completed two successful high-altitude balloon flights with World View Enterprises, gathering valuable data on high-altitude descent for EDL operations.
- 2020: Further demonstrated the system on Blue Origin's New Shepard rocket.

What's Next

DMEN has been selected to fly to the Moon on a future NASA Commercial Lunar Payload Services flight. In addition, Draper has integrated the system's hardware and software into a wearable kinematics system (WKS). Besides tracking crew position, orientation, and pace, a CO2 sensor can enable WKS to provide data to pinpoint effects of behavioral and psychosocial stressors on astronauts in space. WKS was demonstrated during NASA's Joint Extravehicular Activity Test Team Field Test #3 (JETT3) in the Arizona desert.



Image: A NASA engineer takes a simulated moonwalk in the Arizona desert. Credit: Draper.

“By testing in relevant flight environments with realistic hazards, we are enhancing our chances of success for a lunar mission.” — Brett Streetman, Principal Investigator for DMEN, Draper

Next-Generation Suborbital Researchers Conference (NSRC)

February 27-March 1, 2023

Broomfield, Colorado

NSRC gathers the suborbital space research and education communities, including suborbital researchers, educators, flight providers, spaceport operators and government officials. NSRC 2023 will provide an in-depth forum for attendees to discuss funding, new research, and education missions aboard the many suborbital flight vehicles in operation and under development, as well as new results from recent suborbital missions. Flight Opportunities personnel will be in attendance and will host sessions that highlight best practices for suborbital flight testing. The program encourages all current and prospective suborbital researchers to attend.

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Have ideas or feedback for the Flight Opportunities newsletter?

Drop us a line at:

NASA-FlightOpportunities@mail.nasa.gov

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NASA Flight Opportunities Program

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