FLIGHT OPPORTUNITIES

ISSUE 83 — JUNE 2025

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NEWS

ICYMI: 10 Winners of Space Technology Payload Challenge!

NASA announced 10 winners of its fourth **TechLeap Prize** — the **Space Technology Payload Challenge** on June 26. The challenge received a record-breaking response with more than 500 interested registrants from 46 states and U.S. territories plus the District of Columbia. In March, NASA received submissions of more than 200 proposed technologies.

The ten **winning teams** will develop their solutions to address several areas of technology shortfalls that NASA has identified. Each team has the opportunity to win prizes of up to $500,000 each and the chance to flight-test their payload with a NASA-assigned commercial flight vehicle.

Meet the winners

Maiden Flight of Spyder Hypersonic Rocket

Date: June 13, 2025
Organization: UP Aerospace
Vehicle: Spyder hypersonic launch vehicle

UP Aerospace tested the Spyder hypersonic launch system at White Sands Missile Range. UP developed the new vehicle with support from NASA's Flight Opportunities program and Marshall Space Flight Center.

This flight test was designed to improve re-entry capsules by enabling evaluation of stability, control, and thermal management systems during hypersonic flight. During the flight, Spyder reached the hypersonic speed threshold and successfully deployed the Los Alamos National Laboratory's payload test vehicle.

Learn more about the Spyder test flight

The Spyder hypersonic launch vehicle blasts off at White Sands Missile Range on June 13, 2025. Credit: White Sands Missile Range

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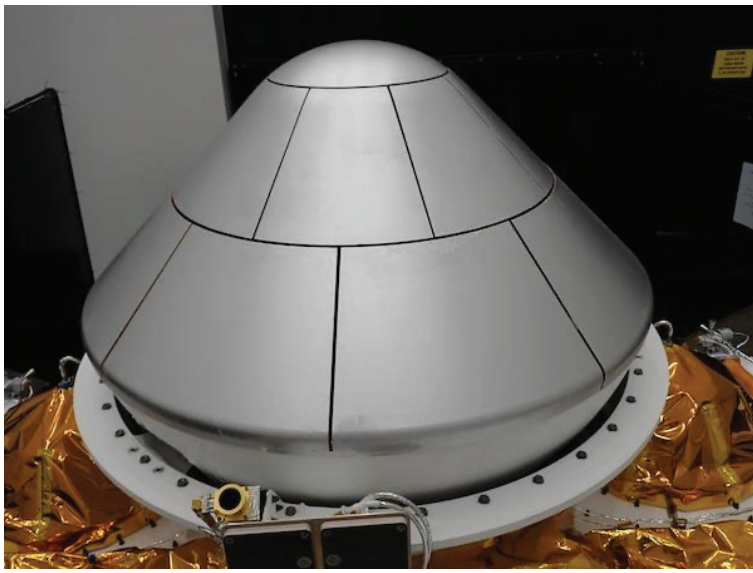
Testing NASA-Developed Heat Shield Manufactured by U.S. Small Business

Date: June 23, 2025
Organization: Varda Space Industries
Vehicle: W-4 capsule launched via SpaceX

With support from a NASA Tipping Point award managed by Flight Opportunities, U.S.-based Varda Space Industries has manufactured a heat shield based on NASA technology and will test how effectively it protects a spacecraft capsule and the payloads inside it from the extreme heat of speeding through Earth's atmosphere.

Varda's W-4 capsule launched via SpaceX into Sun-synchronous orbit on June 23, containing payloads with potential to leverage microgravity



The Varda W-4 capsule that launched via SpaceX on June 23, 2025. The shield protecting the capsule on its return to Earth includes C-PICA licensed from NASA and manufactured by Varda. Credit: Varda Space Industries

to advance technologies that support human health. When these payloads return to Earth for further study, the W-4 capsule will blaze through temperatures up to 7,000 degrees Fahrenheit as it traverses Earth's atmosphere. Varda manufactured W-4's heat shield of **C-PICA** (Conformal Phenolic Impregnated Carbon Ablator), a powerful yet lightweight protective material originally developed at NASA's **Ames Research Center** in California's Silicon Valley.

This is the first time Varda-manufactured C-PICA tiles are making the journey to space and attempting successful re-entry through Earth's atmosphere. Watch this newsletter for updates when W-4 returns home.

Read about this flight test

TECHNOLOGY TRANSITIONS

How a NASA Navigation Concept Transitioned to Multiple Space and Commercial Applications

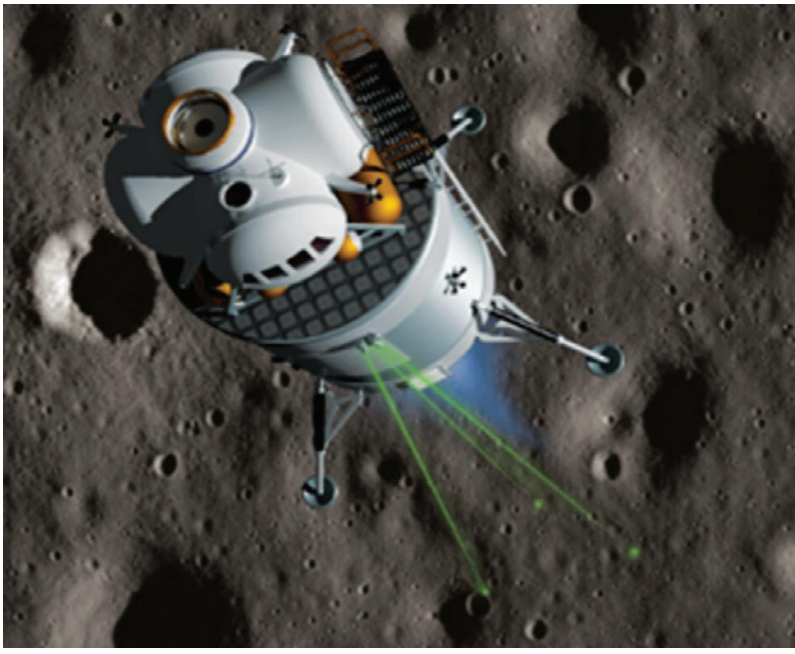
NASA's NDL (Navigation Doppler Lidar) technology was developed at Langley Research Center in Hampton, Virginia with support from the Space Technology Mission Directorate. NDL uses lidar (light detection and ranging) to determine a spacecraft's exact velocity and position to softly land at a desired location on a planetary surface.

From the NDL technology developed by Dr. Farzin Amzajerdian, two transition paths emerged: a NASA technology that's gone to the Moon and a commercial product developed by Psionic.

Moon Mission for Flight-Tested Navigation Doppler Lidar

With support from NASA's Space Technology Mission Directorate and the Flight Opportunities program, researchers at Langley flight tested the NDL technology as part of several NASA projects as well as on Astrobotic's Xodiac rocket-powered lander in Mojave, California. This flight testing helped prepare the technology to go to the Moon in early 2024.

The NDL technology was selected as a payload on two lunar missions within the CLPS (Commercial Lunar Payload Services) initiative: the Astrobotic Peregrine Mission 1 that launched in January 2024 and the Intuitive Machines inaugural mission, IM-1, that launched and landed in February 2024.



Artist concept of a lander descending to the lunar surface with assistance from NDL. Credit: NASA

Read more about NASA's NDL system transition

Flight Tests Advance Commercialization of NASA NDL Technology

Virginia-based Psionic LLC licensed the NDL technology in 2016. A flight test supported by Flight Opportunities, and subsequent testing at Armstrong Flight Research Center, helped Psionic validate their unit's algorithms and data processing to verify its accuracy. Psionic continued research and development on variations of the NDL technology, such as using an additional laser beam and other new components.

Psionic is now giving their version of the NDL technology a commercial spin and building systems for docking operations and autonomous ground and aerial vehicles. Potential uses include self-driving cars as well as space applications, such as a docking mechanism on Axiom Space's planned commercial space station and lunar/Martian lander and rover applications.

NASA engineers and technicians install Psionic's NDL system into a testing pod on a NASA F/A-18 research aircraft ahead of February 2025 flight tests at NASA's Armstrong Flight Research Center in Edwards, California. Credit: NASA

Read more about the Psionic NDL system transition

Share your transition story

Have you transitioned technology you tested with Flight Opportunities to a NASA mission or commercial use?

Let us know!

Share your story!

Did you know?

Two technologies that use ZBLAN (zirconium barium lanthanum aluminum sodium fluoride) optical fibers were tested on parabolic flights supported by Flight Opportunities and then moved on to testing aboard the International Space Station. Space Fibers 3 from FOMS, Inc. and the ORFOM (Orbital Fiber Optic Production Module) from Mercury Systems were designed to enable automated, on-demand manufacturing of optical fibers in space. Both systems leverage NASA suborbital research that demonstrated superior fiber with significant performance improvements when the ZBLAN optical fibers were manufactured in zero gravity compared to fibers produced in ground-based labs. *Credits: Mercury Systems.*

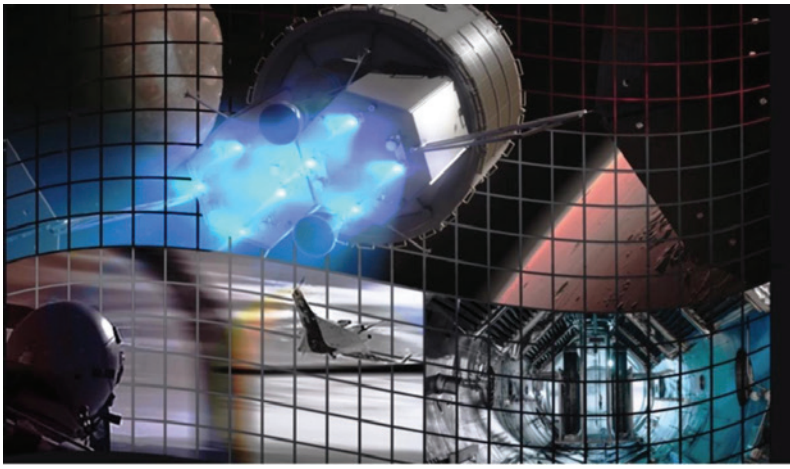
Visit our Technology Transitions webpage

OPPORTUNITIES

Now Open! 2025 NASA SBIR Ignite Phase I Solicitation

The Phase I solicitation opened June 2, and proposals are due July 22. Ideal for high-growth, product-oriented entrepreneurs, startups, and small businesses that have not worked with NASA before, the NASA SBIR Ignite initiative encourages companies to develop commercialization-focused technologies.

The research topic areas of interest for the 2025 solicitation have been specifically selected for their commercial relevance. Proposers must demonstrate how their technology meets a need within the commercial market and provide a strong plan for commercialization of the technology to be competitive for award.



Find out more about the 2025 NASA SBIR Ignite Phase I solicitation

COMMUNITY OF PRACTICE

Our Next Community of Practice Webinar Is August 6!

Watch for details in the next issue of this newsletter and on our **website**!

FEATURED ON-DEMAND WEBINARS

Regolith Roundtable: Best Practices and Insights for Working with Regolith in Flight Testing

Check out our recorded roundtable discussion exploring the complexities and challenges of working with regolith in various flight test environments. The Flight Opportunities team brought together researchers with diverse expertise and hands-on experience testing regolith-related payloads across a variety of flight platforms. The conversation includes:

- Experiment preparation
- How regolith reacts to different activities like digging or plume-surface interaction
- Differences between simulants
- Key platform-specific insights

While diminishing dust hazards on the lunar surface is needed for safe and productive missions, lunar regolith also has potential as an important resource. Credit: NASA

Watch the Regolith Roundtable recording

Watch any of our on-demand webinars

UPCOMING EVENTS

Attending any of these upcoming meetings? Let us know!

- **ASCEND 2025 | July 22-24 | Las Vegas, NV**
- **Small Satellite Conference | August 10-13 | Salt Lake City, UT**
- **ASGSR 2025 | December 3-6 | Phoenix, AZ**

NASA Flight Opportunities Program

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

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