

Flight Opportunities

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Enjoy!
The Flight Opportunities team

TechLeap Prize Winner Orion Labs Tests Quantum Earth Observation System

Orion Labs, a micro-sized business whose employees teamed up for NASA's **TechLeap Prize: Autonomous Observation Challenge No. 1** in 2021, launched their winning payload on July 28, 2022 on a high-altitude balloon from Aerostar of Sioux Falls, South Dakota.

The company's innovation, called Quantum Earth OBServatory (QE OBS), consists of a compact, four unit (4U)-sized CubeSat designed to demonstrate how onboard data processing and quantum machine learning can result in reduced downlink requirements. Its capabilities would reduce the bandwidth needed for small spacecraft to send data about terrestrial events back to Earth.

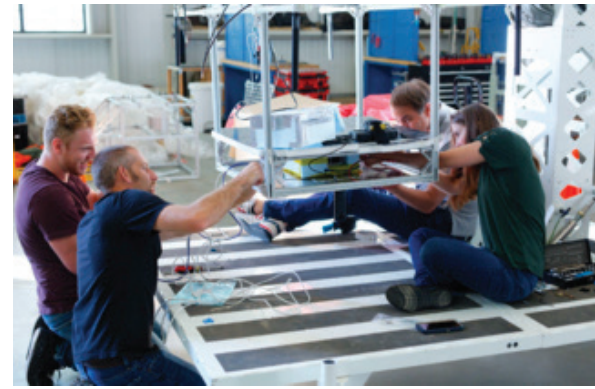


Image: Aerostar's Eric Ramsey and Kelly Banghart work with Kolbron Schoenberger and Sara Jennings of Orion Labs to integrate the Quantum Earth Observation payload onto Aerostar's high-altitude balloon's gondola prior to launch. Credits: Orion Labs/Margarita Reyes

The recent flight test took place over Sioux Falls, so the research team chose dam detection as a use case, as many of the area's small waterways remain unmapped. During the over six-hour flight, the technology collected several thousand images and was able to process large amounts of image data onboard, and downlink only data about confirmed dams to the ground – saving massive amounts of bandwidth in the process.

Read the full NASA feature to learn more about the flight test and the team's TechLeap experience.

Community of Practice

Join Us For the November Webinar

Technology Transition Opportunities: NASA's CubeSat Launch Initiative

Suborbital testing through Flight Opportunities is just one stop on a space technology's journey from development to next steps such as an orbital mission or commercial application. NASA's CubeSat Launch Initiative is a valuable stepping stone for many small spacecraft technologies that have already been tested in a relevant space environment. Join this session to hear the perspectives of NASA's Launch Services program as well as researchers who have advanced their technologies both through Flight Opportunities and CSLI.

Wednesday, November 2, 2022

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

Join on your computer, mobile app or room device

Microsoft Teams meeting

[Click here to join the meeting](#)

Or call in (audio only)

+1 256-715-9946

Phone Conference ID: 522 389 899#

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.

Dean Eppler Shares Lessons Learned From Apollo Era at Recent Colloquium

On Sept. 14, 2022 Dean Eppler, Ph.D. presented the colloquium [How Apollo Landed on the Moon](#) at NASA's Armstrong Flight Research Center. In this 80-minute presentation, Dr. Eppler provided key technical and historical context into the challenges of the Apollo era, including the constraints NASA faced in selecting viable landing sites, understanding challenging terrain and lighting conditions (such as those addressed by NASA's [TechLeap Prize: Nighttime Precision Landing Challenge No. 1](#)) and innovations critical to the success of the landing module. The presentation also includes historical footage of the approach and landing of Apollo 17, including inside the lunar module as well as Mission Control.

With both contract and civil service to NASA dating back to 1986, Dr. Eppler's work for the agency spanned spacesuit development, the International Space Station's Window Observational Research Facility, and Advanced Planetary Exploration Programs, including lunar surface systems, as well as science operations development for lunar missions. After retiring from NASA in 2016, Dr. Eppler now serves as a geologist, systems engineer, and Apollo historian for The Aerospace Corporation.

[Watch the replay of the colloquium](#) to learn more about Dr. Eppler's insights and lessons learned from the Apollo era.



Opportunities

NASA Seeks Judges for TechRise Student Challenge 2022-23

Do you or your colleagues have expertise in science, engineering, space, or atmospheric research? NASA is looking for volunteer judges for the 2022-23 TechRise Student Challenge! Reviews of student team applications should take approximately 4-5 hours.



[Learn more about TechRise and submit an interest form.](#)

NASA Announces New CubeSat Launch Initiative Partnership Opportunities

NASA has announced a **new round of opportunities** through the agency's **CubeSat Launch Initiative (CSLI)** for CubeSat developers, including educational institutions, to conduct scientific investigations and technology demonstrations in space and contribute to the agency's exploration goals.

With a renewed emphasis on education, the next round of NASA's CSLI opportunities is providing access to low-Earth orbit for U.S. educational institutions, nonprofits with an education or outreach component, and NASA centers and programs for workforce development. Developers can gain hands-on experience designing, building, and operating these small research satellites. CSLI encourages participation by Minority Serving Institutions and is actively seeking participation from organizations in states not previously selected. These states are: Delaware, Mississippi, Nevada, North Carolina, Oklahoma, South Carolina, South Dakota, and Wyoming.

CSLI may be relevant to those seeking a variety of types of flights tests to advance their technologies.

[Read the press release](#)

Applications due: November 18, 2022 by 4:30 p.m. EST

Technology Transition Spotlight



Image: Successful deployment of a LISA-T thin film solar array on a parabolic flight provided by Zero Gravity Corporation in November 2019. Credits: NeXolve Holding, LLC

NeXolve's LISA-T to be Demonstrated on NASA's PTD-4 Mission

The Technology: LISA-T

Developed by NASA Flight Opportunities **TechFlights** awardee NeXolve in collaboration with NASA's Marshall Space Flight Center, the Lightweight Integrated Solar Array and Antenna (LISA-T) is an integrated solar array designed to provide power to CubeSats and other small spacecraft. LISA-T is deployed from an extremely compact volume and current designs are scalable from 100-500 watts, with options to scale to 1000 watts and beyond.

Why It Matters

Because small spacecraft have space and mass limitations, deploying large-area arrays from a reduced volume and mass envelope greatly enhances power generation and communications capabilities. Utilizing small spacecraft such as CubeSats for missions in deep space will necessitate the need for more electrical power, and LISA-T's thin film solar array offers lower mass, lower stowed volume, and 300% more power per mass and volume allocation than the current state-of-the-art thick film solar arrays.

Suborbital Flight Milestones

Flight Opportunities-supported testing in 2019 on Zero Gravity Corporation's G-FORCE ONE parabolic aircraft enabled LISA-T innovators to successfully achieve three main flight testing objectives, giving the technology the flight heritage needed for infusion in orbital missions:

- Successful deployment of LISA-T's central bistable booms under zero gravity conditions
- Successful deployment of all four mast booms from LISA-T's top hat assembly under zero gravity conditions
- Successful unfolding of one of four thin solar arrays (petals) to demonstrate a fully deployed thin film solar array panel

What's Next

Resulting in part from NASA-supported flight testing, LISA-T was selected for demonstration as part of NASA's [Pathfinder Technology Demonstrator](#) project, a series of missions to test the operation of a variety of novel CubeSat technologies in low-Earth orbit, providing significant enhancements to their performance. The successful demonstration of new subsystem technologies like LISA-T will increase small spacecraft capabilities enabling direct infusion into a wider range of future science and exploration missions. LISA-T is specifically planned for demonstration on PTD-4, currently slated for no earlier than mid-2023. PTD missions are managed by NASA's [Small Spacecraft Technology](#) program, part of the agency's Space Technology Mission Directorate.

Events

[American Society for Gravitational and Space Research \(ASGSR\) Annual Conference](#)

November 9-12, 2022

Houston, Texas

Join Flight Opportunities Deputy Program Manager Danielle McCulloch in conversation with NASA-supported researchers Zachary Gaines (California State Polytechnic University) and Anna-Lisa Paul, Ph.D. (University of Florida) for the panel Leveraging Suborbital Flight Tests to Advance Science and Technology on November 10 at 12:30 p.m. CDT. [View the conference program](#) for more information.

[American Geophysical Union \(AGU\) Fall Meeting](#)

December 12-16, 2022

Chicago, Illinois and Online

Stop by the NASA booth (#1937) to visit our Flight Opportunities table and plan to join representatives from our team for a multimedia presentation.

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.

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Drop us a line at:

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NASA Flight Opportunities Program

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