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Berkeley Engineering, Tomorrow Begins Today



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Berkeley Engineering A New Generation in Aerospace

On Tuesday, May 2nd, students from the University of California, Berkeley visited NASA Ames to learn about the research being conducted at the center. The group of visitors were led by Professor Panos Papadopoulos, the Director of Aerospace Engineering Programs. He brought the entire freshman class of the new aerospace engineering undergraduate major, as well as the student leaders of the different aerospace clubs active on the campus for this visit. Professors Mark Mueller and Murat Arca were also part of the group of visitors. The visitors learned about

the Mars Helicopter and NASA internships, toured the Arc Jet Facility, the Unitary Wind Tunnel Complex, the NASA Advanced Supercomputing Facility, the Systems Health, Analytics, Resilience and Physics modeling (SHARP) lab, and the UAVs that support Earth Science missions, and met with Director Eugene Tu at the end of the day. After the tour, Prof. Papadopoulos said the students were “raving about the visit.” One can imagine the excitement they’re feeling about what their future holds in aerospace.



Berkeley Engineering

Unleashing the Power of Interval-Training Exercise: A Potential Breakthrough for Persistent Post-Concussive Symptoms

By Ted Triano, NRP Post Editor, June 30, 2023

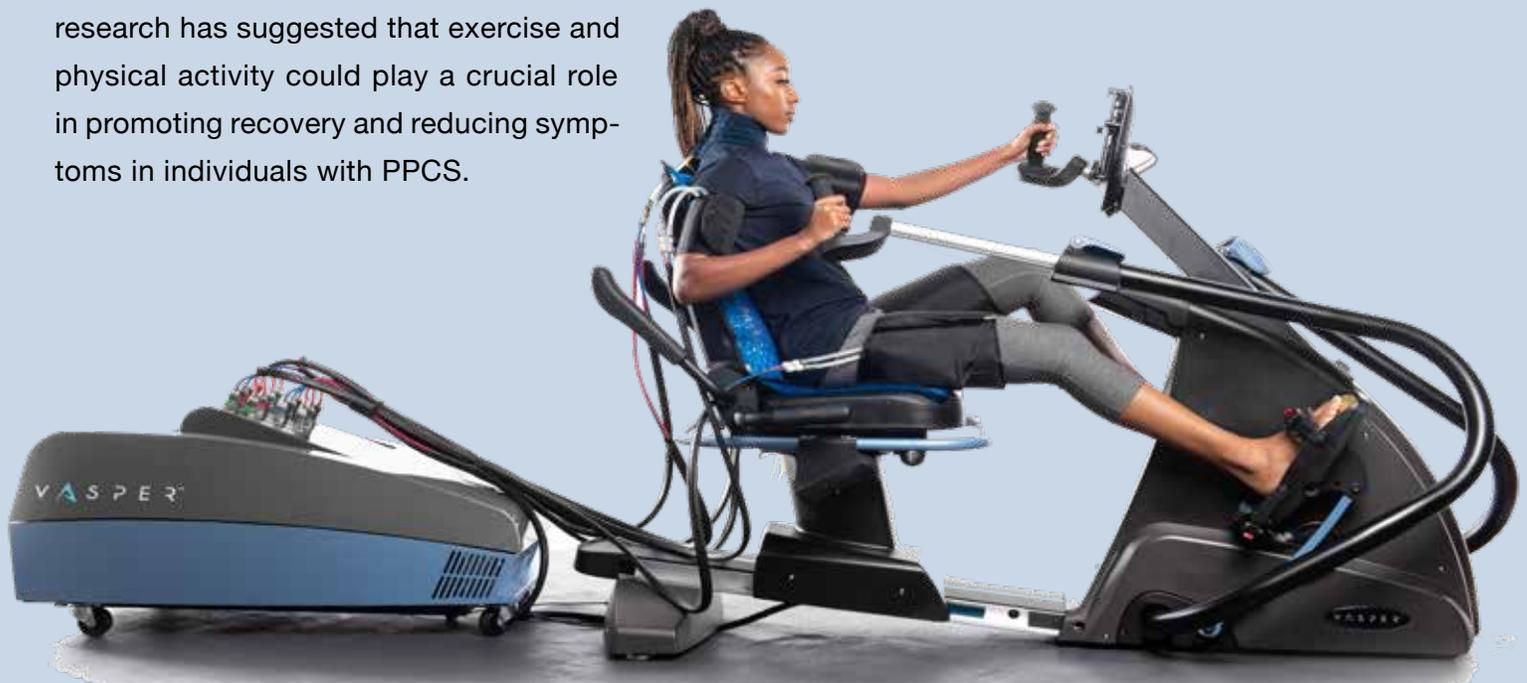
Persistent post-concussive symptoms (PPCS) can significantly impact the lives of individuals who have experienced a concussive event. While rest has been the traditional approach, recent studies have suggested that progressive physical activity may be beneficial for those with PPCS. In a pilot study conducted by Yi-Ning Wu and colleagues, the effects of a 12-session moderate intensity-interval-training program with blood flow restriction (BFR) and body cooling (BC) were examined on individuals with PPCS for less than one year. This article delves into the findings of this study, shedding light on the potential of interval-training exercise to alleviate post-concussive symptoms and promote stable recovery.

Understanding PPCS and the Need for Novel Interventions:

Persistent post-concussive symptoms refer to the lingering physical, emotional, cognitive, and social impairments experienced by individuals after experiencing concussive events. While most concussions resolve within a few weeks, a significant proportion of patients continue to suffer from symptoms for weeks, months, or even years. Conventional management strategies have focused on rest and gradual return to physical and cognitive activities. However, recent research has suggested that exercise and physical activity could play a crucial role in promoting recovery and reducing symptoms in individuals with PPCS.

The Role of Interval-Training Exercise with BFR and BC:

The pilot study conducted by Wu and colleagues aimed to investigate the effects of interval-training exercise with BFR and BC on individuals with PPCS. The study included 25 adults who were randomly assigned to either the experimental group (exercise with BFR and BC) or the control group (exercise without BFR and BC). Both groups engaged in 12 sessions of moderate intensity interval-training exercise over a span of six weeks, twice a week.





Promising Findings and Reduced Symptom Fluctuations:

The results of the study showed promising outcomes for the experimental group. During the intervention period, individuals in the experimental group experienced significantly less fluctuation in overall symptom severity, cognitive domain severity, and mood domain severity compared to the control group. The experimental group also exhibited more stable symptom recovery during the follow-up period, with reduced symptom fluctuations and stable recovery in the cognitive and sleep domains. Additionally, the severity of mood and sleep symptoms remained more stable in the experimental group during the follow-up period.

Understanding the Mechanisms: BFR, BC, and Exercise Adaptations:

The use of blood flow restriction (BFR) and body cooling (BC) during interval-training exercise holds potential benefits for individuals with PPCS. BFR, achieved through the application of pressure cuffs, creates hypoxic conditions and forces the body to utilize anaerobic metabolism, potentially aiding in neuroprotection and brain health. BC may help minimize the impact of exercise-induced heat production on brain functions. Interval training, with its short bouts of exercise and rest intervals, has shown positive effects on autonomic and cardiovascular functions. The combination of these modalities may allow individuals with PPCS to tolerate exercise better and reap its benefits at lower intensities.

Implications and Future Directions:

The pilot study suggests that moderate intensity-interval-training exercise with BFR and BC can alleviate post-concussive symptoms in individuals with PPCS for less than one year. These findings have significant implications for the management and recovery of individuals with PPCS, offering a potential alternative to the traditional rest-based approach. Further research with larger sample sizes and longer intervention periods is warranted to validate and expand upon these initial findings.

Conclusion:

The pilot study conducted by Wu and colleagues provides valuable insights into the effects of interval-training exercise with BFR and BC on individuals with PPCS. The results indicate that this novel approach may promote stable recovery.

Original study and source for this article:

Yi-Ning Wu, Caroline Stark, Jessica Gravel, Matthew White, Josh Avery, Terrie Enis, and Robert C. Cantu. Effects of Interval-Training Exercise on People Who Have Had Persistent Post-Concussive Symptoms for Less Than One Year: A Pilot Study *Journal of Neurotrauma* March 2021.573-581. <http://doi.org/10.1089/neu.2019.6915>

pdf version of original article:

<https://vasper.com/wp-content/uploads/2021/03/Journal-of-Neurotrauma-38-5-573-004.pdf>



CMU to Lead NASA Space Technology Research Institute

By Monica Cooney

A new NASA Space Technology Research Institute (STRI) led by Carnegie Mellon University seeks to shorten the cycle required to design, manufacture, and test parts that can withstand the conditions of space travel through constructing models for qualification and certification.

In space travel, custom parts for vehicles such as rockets and satellites are often needed quickly to accommodate changes in design, as well as for repair and functionality purposes. Additive manufacturing is an ideal technology to meet these needs, as components can be made through a relatively short cycle of design, build, and test. However, this cycle must be continually refined in order to ensure the quality and reliability of the 3D printed parts.

A new NASA Space Technology Research Institute (STRI) led by Carnegie Mellon University seeks to shorten the cycle required to design, manufacture, and test parts that can withstand the conditions of space travel through the development of models for qualification and certification (Q&C).

First set up in 2016, the overall STRI program aims to strengthen NASA's ties to the academic

“The STRI affords us an opportunity for a major collaboration through which we can construct the models that our partners at NASA very much need.”

Tony Rollett, Professor, Materials Science and Engineering

community through long-term, sustained investment in research and technology development, while also fostering talent among highly-skilled engineers, scientists, and technologists.

The \$15 million project, Institute for Model-based Qualification & Certification of Additive Manufacturing (IMQCAM), will be co-directed by Tony Rollett, a professor of materials science and engineering at Carnegie Mellon University, and Somnath Ghosh, a professor of civil and systems engineering at Johns Hopkins University.

“In order to make a printed product have predictable properties, we need to understand more about what its internal structure is, how it depends on the printing process, and what properties it has,” said Rollett. “The STRI affords us an opportunity for a major collaboration through which we can construct the models that our partners at NASA very much need in order to do their work.”

Over the course of five years, the institute will develop detailed computer models, or digital twins, for additively manufactured parts that have been validated against experimental data, verified against physical mechanisms, and subjected to rigorous uncertainty quantification protocols. The models will evaluate response to fatigue in space-flight materials that are currently used for 3D printing, as well as introducing and qualifying new materials.

The project outcomes will serve as a vital resource for partners at NASA, as the models will enable them to better predict the parts’ performance abilities.

The Institute will also serve as a catalyst for recruiting and training students and post-docs to have a comprehensive understanding of the additive manufacturing Q&C process and be the future leaders in the field. Students from across institutional partners will be mentored by both STRI team members and NASA researchers throughout the project.

Carnegie Mellon faculty members Sneha Prabha Narra, Mohadeseh Taheri-Mousavi, and Bryan Weblar will also contribute their expertise to the institute.

Additional institutional partners on the project include Vanderbilt University, University of Texas at San Antonio, University of Virginia, Case Western Reserve University, Johns Hopkins University Applied Physics Laboratory, Southwest Research Institute, and Pratt & Whitney.

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Bloom Energy Demonstrates Hydrogen Production with the World's Most Efficient Electrolyzer and Largest Solid Oxide System PRESS RELEASE MAY 3, 2023

Installation shows commercial readiness, superior performance and scalability of Bloom technology

SAN JOSE, Calif. – May 3, 2023 – Bloom Energy (NYSE:BE) has begun generating hydrogen from the world's largest solid oxide electrolyzer installation at NASA's Ames Research Center, the historic Moffett Field research facility in Mountain View, California. This high-temperature, high-efficiency unit produces 20-25% more hydrogen per megawatt (MW) than commercially demonstrated lower temperature electrolyzers such as proton electrolyte membrane (PEM) or alkaline.

This electrolyzer demonstration showcases the maturity, efficiency and commercial readiness of Bloom's solid oxide technology for large-scale, clean hydrogen production. The 4 MW Bloom Electrolyzer™, delivering the equivalent of over 2.4 metric tonnes per day of hydrogen output, was built, installed and operationalized in a span of two months to demonstrate the speed and ease of deployment.

"This demonstration is a major milestone for reaching net-zero goals," said KR Sridhar, Ph.D., Founder, Chairman and CEO of Bloom Energy. "Hydrogen will be essential for storing intermittent and curtailed energy and for decarbonizing industrial energy use. Commercially viable electrolyzers are the key to unlocking the energy storage puzzle, and

solid oxide electrolyzers offer inherently superior technology and economic advantages. Bloom Energy, as the global leader in solid oxide technology, is proud to share this exciting demonstration with the world: our product is ready for prime time."

The current demonstration expands on Bloom's recent project on a 100 kW system located at the Department of Energy's Idaho National Laboratory (INL) which achieved record-breaking electrolyzer efficiency. In the ongoing project, 4500 hours of full load operations have been completed with a Bloom Electrolyzer™ producing hydrogen more efficiently than any other process – over 25% more efficiently than low-temperature electrolysis.

The INL steam and load simulations replicated nuclear power conditions to validate full capability of technology application at nuclear facilities, and the pilot results revealed the Bloom Electrolyzer producing hydrogen at 37.7 kWh per kg of hydrogen. Dynamic testing conducted at INL included ramping down the system from 100 percent of rated power to 5 percent in less than 10 minutes without adverse system impacts. Even at 5 percent of rated load, the energy efficiency (kWh/kg) was as good or better than other elec-

trollyzer technologies at their 100% rated capacity. These results will be presented at the Department of Energy's Annual Review Meeting in Washington DC on June 7, 2023.

"The amount of electricity needed by the electrolyzer to make hydrogen will be the most dominant factor in determining hydrogen production cost. For this reason, the efficiency of the electrolyzer, the electricity needed to produce a kilogram of hydrogen becomes the most critical figure of merit. This 4 MW demonstration at the NASA Ames Research Center proves that the energy efficiency of our large-scale electrolyzer is similar to the small-scale system tested at INL highlighting the strength of our modular architecture," said Dr. Ravi Prasher, Chief Technology Officer of Bloom Energy. "The electrolyzer product is leveraging the Bloom platform knowhow of more than 1 GW of solid oxide fuel cells deployed in the field and providing approximately 1 trillion cumulative cell operating hours. The same technology platform that can convert natural gas and hydrogen to electricity can be used reversibly to convert electricity to hydrogen. With Bloom's high-efficiency, high-temperature solid oxide electrolyzers, we are one step closer to a decarbonized future powered by low-cost clean hydrogen."

This demonstration represents a "full circle moment" for the company, which can trace its roots to work performed as part of NASA's Mars Space Program in the early 2000s. Dr. KR Sridhar and his team were charged with creating a technology that could sustain life on Mars. They built electrolyzers capable of producing oxygen and fuel from solar electricity on Mars, and operated the device in the reverse direction as a fuel cell to produce electricity. They soon realized that their technology could have an even greater impact here on Earth and founded Bloom Energy in 2001 with the mission to make clean, reliable energy affordable for everyone on earth. This hydrogen demonstration is at the NASA Moffett Field site where Bloom Energy started operations over 20 years ago in a 7000 sq. ft. garage.

Today, Bloom has grown into a \$1.2 billion company with sales across the U.S. and to four countries in Asia and two countries in Europe, and it has developed more than 2 GW of manufacturing capacity at its manufacturing plants in Fremont, Ca., and Newark, Del. Bloom's energy servers support data centers, hospitals, retail, universities and food producers with clean, AlwaysOn power.

Media and qualified parties are invited to schedule a visit to see the demonstration at NASA's Ames Research Center at Moffett Field from May 15-30, 2023. For more information

and to schedule your visit to the 4 MW Bloom Electrolyzer,™ the world's largest and most efficient solid oxide electrolyzer, go to: www.bloomenergy.com/blomelectrolyzer/.

Forward-Looking Statements

This press release contains certain forward-looking statements that are subject to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements generally relate to future events or our future financial or operating performance. In some cases, you can identify forward-looking statements because they contain words such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "should," "will" and "would" or the negative of these words or similar terms or expressions that concern Bloom's expectations, strategy, priorities, plans or intentions. These forward-looking statements include, but are not limited to: Bloom's expectations regarding the efficiency, hydrogen production per MW, commercial readiness and readiness for prime time of the Bloom Electrolyzer; progress towards net-zero goals and a decarbonized future; the essentialness of hydrogen; the future of energy storage solutions; the technological and economic superiority of solid oxide electrolyzers; and Bloom's long-term commitment to particular industries, regions, policies or imperatives. More information on potential risks and uncertainties that may impact Bloom's business are set forth in Bloom's periodic reports filed with the SEC, including its Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 21, 2023, as well as subsequent reports filed with or furnished to the SEC from time to time. Bloom assumes no obligation to, and does not currently intend to, update any such forward-looking statements.

About Bloom Energy

Bloom Energy empowers businesses and communities to responsibly take charge of their energy. The company's leading solid oxide platform for distributed generation of electricity and hydrogen is changing the future of energy. Fortune 100 companies around the world turn to Bloom Energy as a trusted partner to deliver lower carbon energy today and a net-zero future. For more information, visit www.bloomenergy.com.

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National, Global Momentum Show it's Time for Open Science Action, Experts say

By Rachel Leven - October 28, 2022

The federal government and research institutions must make science more accessible, reproducible and inclusive, NASA and UC Berkeley leaders said at an Oct. 26 event on campus hosted by the Division of Computing, Data Science, and Society at Berkeley.

It's also urgent to diversify who is doing the scientific work, NASA and Berkeley experts said. While these aren't new calls to action, national and global momentum makes it the right moment to take decisive action, they said.

"We have all these capabilities to do science that we didn't have just a few years ago," said Chelle Gentemann, science lead for the new \$40 million, 5-year Transform to Open Science (TOPS) mission at NASA. "We have plans and policies around the globe that are being updated to support open science."

"We want to do this now," Gentemann said. NASA has named 2023 its year of open science.

Open science is the practice of making studies and the underpinning data, software and hardware designs freely accessible. This makes it easier to verify, replicate and accelerate discovery. It's especially important now, speakers said. Trust in science has waned, even as scientific responses to challenges from combating Covid-19 to climate change become more visible to the public.

"Open science and open source tools and platforms are the future – the future of science and indeed the future of society," said Jennifer Chayes, UC Berkeley's Division of Computing, Data Science, and Society associate provost and School of Information dean. "Berkeley has a long tradition of open source contributions... in research, education and impact in the world."

Lika Guhathakurta, senior advisor for new initiatives at Goddard Space Flight Center and program scientist at NASA, and Fernando Pérez, an associate professor in Berkeley's Statistics Department, also spoke at the event. 'Creating a more equitable science'

"Open science and open source tools and platforms are the future – the future of science and indeed the future of society,"

Jennifer Chayes, UC Berkeley's Division of Computing, Data Science, and Society associate provost and School of Information dean. Environmental Engineering

Open science has historically been a grassroots movement. For example, Pérez invented one of the foundational tools for analyzing large amounts of data in a transparent and collaborative way – IPython – as a physics Ph.D. student struggling to complete his dissertation.

Berkeley and Cal Poly researchers collaborated to advance the tool, which evolved into Project Jupyter. It has been used by scientists worldwide to do groundbreaking work like capturing the first image of a black hole. Pérez said the collaborative nature and accessibility of the open science movement has been crucial to bringing young, diverse scientists into the fold.

Leaders must be intentional about keeping these values, as more institutional funding is offered and bigger companies join the movement, Pérez said.

“One of the key considerations has been, ‘How do we design a model for decision-making, governance and participation that allows one engineer or person in Argentina or Colombia to participate on a reasonably equal footing with a team of engineers from Amazon or Google or Microsoft or Adobe,’” Pérez said. “We want those teams... but we also don’t want them to overwhelm this open space of voices that often have not been heard.”

Gentemann said her team is working to retain historically marginalized people and groups who have been thriving

in this open science space. To do that, her team has created opportunities like monthly forums to listen to and collaborate with the community. They’re also focused on making competition for new NASA funding more equitable.

“The evidence is overwhelming. Diverse groups not only ask better questions — they get the answers faster, and they have more impact,” Gentemann said. “That’s part of this evolution towards open science, this evolution towards a new platform and voices creating a more equitable science.”

Speakers mentioned additional challenges. Leaders must identify how to maintain projects and tools for the long term, so scientists can continue to build off their work. They also must figure out how to make the creation, sharing and maintenance of open-source tools part of scientists’ valued career paths, rather than solely succeeding in science through publishing research.

Berkeley is a welcoming space for those young people who are ready to invest in open science, Chayes said.

“This community is attracting people who are willing to take risks to create something new,” Chayes said. “The world is coming around, and we’re here to lend you support.”

Event Speakers



Jennifer Chayes
Associate Provost, Computing,
Data Science, and
Society UC Berkeley



Dr. Chelle Gentemann



Dr. Lika Guhathakurta



Professor Fernando Pérez

Hyperspectral At All Altitudes: Flight Testing USGS Hyperspectral Imagers on Stratospheric Aircraft

By Tim Newman & Eric Reichard- November 18, 2022

USGS partners with NASA and industry to explore science use cases for high-altitude hyperspectral imagery

Opportunity

USGS and our partners are exploring high-altitude hyperspectral imagery to solve a diverse set of science challenges, from ecosystem mapping and critical mineral detection to flooding and pre- and post-wildfire landscape metrics. This work builds on our own hyperspectral community's world-class spectra library, which is currently used to interpret ground and airborne observations. Additional data from NASA's Airborne Visible Infrared Imaging Spectrometer (AVIRIS) provides best-in-class hyperspectral imagery, including upcoming acquisitions for the Mineral Resource Program.

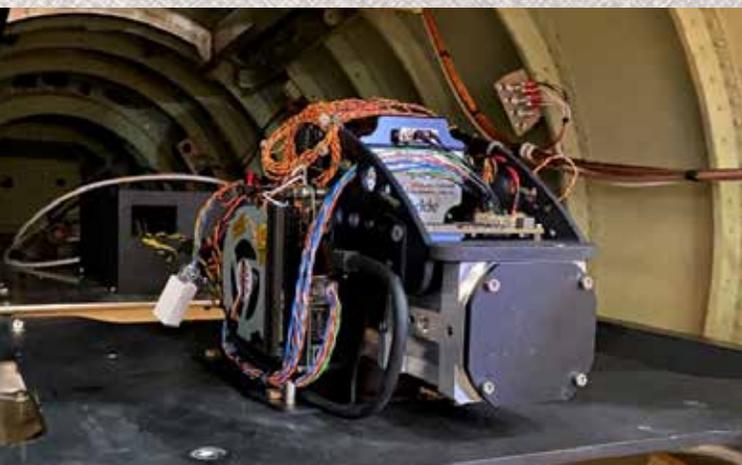
With support from the National Land Imaging Program, engineers at USGS Moffett Field are exploring a value-add to AVIRIS data, using a relatively low-cost hyperspectral imaging sensor that can be deployed on UAS flying in the stratosphere, and at all altitudes below that. The concept of operations is to explore how flight altitude impacts the science one can do with hyperspectral data, identifying which bands are key to doing that science, and assessing data quality and sensor performance from commercial off-the-shelf imagers. By reducing cost and other barriers to hyperspectral data collection at all altitudes, this new capability will advance our ability to focus this technology on impactful science challenges. In essence, USGS is bringing the sensors, while NASA and private industry are providing elements of system integration and sensor calibration, as well as flight platforms. The Geology Minerals Energy and Geophysics Science

Center hosts the National Innovation Center, which provides guidance and direction for UAS Research Center staff engineers Elizabeth Hyde and Isaac Anderson.

Liz and Isaac partnered with scientists and engineers from NASA Ames Research Center (ARC), NASA Armstrong Flight Research Center (AFRC), and Norsk Elektro Optikk (NEO) to integrate and fly a modified, high-altitude HySpex V-1240 imaging sensor on NASA's ER-2 (image at right). Private industry partners at Swift Engineering assisted in testing the modified sensor's durability under high-altitude conditions. The sensor rode in the nose-cone of the ER-2 during NASA's Western Diversity Time Series 2022 campaign over California, which carried AVIRIS, MASTER, HyTES and PICARD instruments. Testing the performance of this modified, lightweight, size and power system is the first step to creating a low-cost hyperspectral imaging capacity, from the ground to the stratosphere.

Preparing For The Flight

To prepare for the ER-2 flight, as well as planned stratospheric UAS flights in 2023, the team worked with NEO and the Swift Engineering team to reduce the weight of the payload, calibrate the sensor for stratospheric flight, and test it for resistance to low temperatures and pressures at high altitudes. The Swift team had already designed and built a payload housing for their high-altitude aircraft, which was further engineered and adapted to fit on the ER-2 aircraft. NEO engineers developed an external power adapter to enable pilot-control of the sensor. NASA AFRC engineers and technicians modified existing ER-2 hardware to accompany the modified HySpex payload, performed thermal vacuum testing and sensor calibration. After delivery, USGS engineers and NASA scientists further tested the system in the Airborne Science Facility lab at NASA Ames.



High-altitude version of the HySpex Mjolnir V-1240 installed in the nose of the ER-2. This assembly is specially focused for high-altitude imagery and has a lightweight housing design for use on High Altitude Long Endurance UAS. Photo Credit: Liz Hyde (USGS)

The Flight

The initial flight of the Western Diversity Time Series 2022 campaign was the first stratospheric flight carrying a HySpex imager. The campaign flew swaths in the Sierra Nevada foothills, near Lake Tahoe (see image below), areas in the San Francisco Bay Area, Santa Barbara coast, the Los Angeles Basin, and a broader area near Lake Tahoe, including the initial stages of the Mosquito fire, which burned west of the Tahoe Basin. The USGS data are currently being loaded into NASA Earth Exchange (NEX) to enable automated workflows, high-end computing power, and data processing, to aid USGS researchers in data analysis and application development.

Upcoming Opportunities

USGS is in discussions with stratospheric UAS platform providers to schedule test flights on High Altitude, Long Endurance (HALE) aircraft. Flights may occur as early as Spring 2023 on the Swift Ultra Long Endurance UAS, as well as the Sceye airship, with the goal of looking at critical minerals in New Mexico. The initial phase of this effort is to prove the efficacy of stratospheric hyperspectral observations, potentially leading to regular deployments on HALE uncrewed aircraft.

In conjunction with the modified high-altitude instrument, a second HySpex imager (Mjolnir VS-620) is being procured by USGS to cover flight regimes under 40,000 ft. Thanks to ongoing collaborations with NASA Ames, this “standard” altitude instrument will have the opportunity to fly on either UAS or crewed aircraft at lower altitudes. This imager has a wider spectral range (400 to 2500 nm), and while it is physically larger than the high-altitude version, it is capable of being flown on the upcoming heavy-lift sUAS in the Department

of the Interior (DOI) fleet as well as crewed aircraft, such as the NASA B200 King Air. USGS engineers are also planning to develop and integrate a package that can be flown at much lower altitudes using DOI sUAS assets. Together, this suite of capabilities will ultimately enable USGS to gather data from low (0-1,000 ft), medium (1,000 – 40,000 ft) and high (40,000+) altitudes.

Increasing USGS Hyperspectral Data Capacity

Advancing USGS’s ability to gather hyperspectral data from low, medium, and high altitudes, using a variety of UAS platforms, will increase our capacity to collect, process, and interpret hyperspectral data for a broad range of earth science applications. By demonstrating sensor flexibility across UAS platforms and altitudes, USGS can greatly increase our observational and monitoring capabilities, and improve post-event situational awareness, as well as develop longer-term, repeat visit missions over critical areas and phenomena of interest. We invite the broad USGS community to take advantage of these new imaging spectrometers, either through stratospheric applications, or through sUAS deployments working with the National Uncrewed Systems Office (NUSO).

For more information on the Hyperspectral At All Altitudes effort, contact NIC Director Jonathan Stock.

Tim Newman
Program Coordinator, National Land Imaging

Eric Reichard
Director, Southwest Region



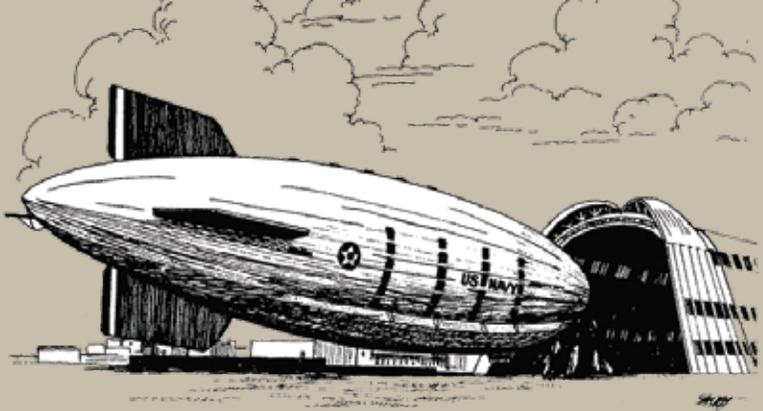
Natural color image from the first flight of the high-altitude HySpex V-1240. Image is oriented with respect to true North, and is centered around Colombia, CA. Image Credit: USGS

Trond Loke (NEO), Isaac Anderson (USGS) and Liz Hyde (USGS) standing in front of the NASA ER-2, during deployment to NASA Armstrong Flight Research Center, Palmdale, CA. Photo Credit: USGS



Moffett Field Museum 90th Anniversary as Well as “Man in Space”

Tom Spink, President
Jeff Wasel PhD, Museum Executive Director



April was a very important month this year at NRP, especially on April 12th. This date marked the 90th anniversary of the establishment of Moffett Field, as well as NASA’s celebration of “Man in Space”, and the honoring of cosmonaut Yuri Gagarin, the first man launched into space on April 12th, 1961.

To mark these two significant milestones, the Moffett Field Historical Society and Museum displayed numerous artifacts on loan from NASA Ames, including a Moon Rock, space shuttle tiles, and other unique space-related artifacts and ephemera.

In addition, the Moffett Museum highlighted their numerous permanent NASA displays, including rare, 5 and 6 degree of freedom simulator models of large simulators used in the past at Ames, that prepared astronauts for the extreme g-forc-

es they were expected to encounter during space flight, along with pictures of various lifting bodies and aircraft under test conditions in the large wind tunnel. Other displays include a Harrier Jump Jet cockpit, and three NASA research aircraft that are displayed in our Air Park. Numerous additional NASA and NACA-related pictures can be found throughout the museum, depicting many of NASA Ames’ research projects, including one-of-a-kind research aircraft from various eras. Of note is a picture of Neal Armstrong at Moffett Field during preparations for his historic landing and walk on the moon.

The Moffett Museum is open Wednesday through Saturday, 10 am to 3 pm. Our docents are always here to educate and inform, and docent-led tours are available for larger groups with prior arrangement.



Photos by Tom Spink and Jeff Wasel

Upcoming iNARTE® Certified ESD AeroSpace & Defense Engineer Training™ to be conducted Onsite at NASA Ames Research Center by RMV

Renee Mitchell, President, RMV Technology Group LLC
Moffett Field, California, 10 February 2023



Since 2009, RMV Technology Group LLC (RMV), NRP Industry Partner and Service-Disabled Veteran Owned Small Business, has been located onsite at NASA Ames Research Park in Building 19 where USGS is now remodeling the entire building. Recently moved to our new headquarters at the Space Portal, RMV enjoys a better usage of our ESD Materials Testing Laboratory and a separate office for the RMV staff. It's a great view and we can see the ongoing transformation of the dirigible hangar into a State-of-the-Art R&D facility by Planetary Ventures.



The RMV unique training platform (Virtual and Onsite) continually updates the ESD requirements for Mission critical projects for the benefit of NASA, the DoD and the DOE. The NEW and revised NASA STD-8739.6, Section 7 is now required of all federal contractors that package, handle, store and transport ultra-sensitive devices. The intensive 5-day course will be held onsite at NASA Ames Research Center from April 24-28, 2023 for active NASA ESD Program Managers that work on ESD control at NASA, the DOE and the DoD.

As required, this course is taken every two years for NASA ESD Program Managers. The last course was held in 2021 virtually due to the pandemic in full swing during that time. Shortly thereafter, Bob Vermillion received an Award of Excellence from NASA on the redesigned Virtual Training platform that replaced the RMV On-Site Hands On Training for NASA since 2014.

Designed and developed by RMV (the Creator of Hands-On ESD Space & Defense Training) for US civil servants and contractors that require robust quality and reliability in harsh environments, the onsite training is software driven and records ESD events in real time, combined with live demonstrations, experiments and Hands-On Training of ESD 2021 iNARTE® Certified Space & Defense ESD Program Monitor™ Training for

GRC iNARTE® Digital Badge for Achievements and Credentials Instrumentation. Workshops and breakout sessions will be held throughout the week to reinforce the training process. For all current and future courses held onsite, RMV has implemented safety guidance rules for the ARC participants.

The 5-day course will include ESD/ESA Issues and CubeSat Integrity, Equipment Standards, Equipment Reliability and Harsh Environments, Class 0A & 0B Safeguards, ESD Packaging & Materials, Material Handling, Storage & Transport, How to Locate ESD Events before Launch, ESD Counterfeit Threats, Utilizing ESD Instrumentation and Case Studies, Workstation EPA Verification & Certification Measurements for NASA STD 8739.6B, Section 7, ANSI ESDS20.21 and applicable MIL STDS., ESD Assessments and Troubleshooting, ESD impact upon Equipment Reliability for Mission Critical program.

A remote exam proctored by Exemplar Global (ASQ family of companies), the 3rd party international global certification body, is taken on the last day. The iNARTE® Digital Badge can share your credentials and achievements online in a way that is simple, trusted, and can be verified in real time online.

For more information on the upcoming On-Site ESD Training Course, please contact Renee Mitchell direct at 650-964-4792 or email renee@esdrmv.com. Also, visit the site at www.esdaerospacetraining.org



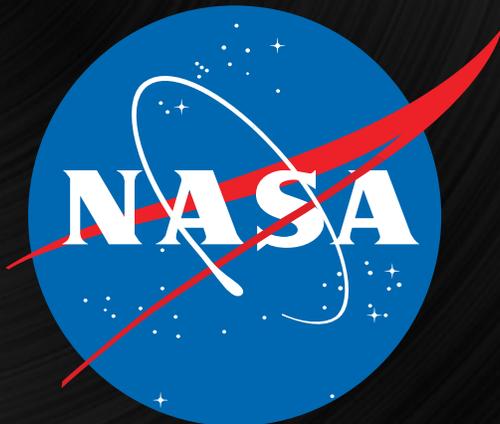


On June 7-8, 2023, the National Academies committee visited Ames and NASA Research Park, met with Center leadership, toured major facilities and engaged in listening sessions with employees.

On March 29, 2023, leaders from Office of Strategic Infrastructure and Facility Real Estate Division visited Ames, NASA Research Park and toured the Planetary Ventures Bay View Campus.



On May 18, 2023, Ames hosted leaders from International Space University (ISU). Meighan Haider, Director of NASA Research Park and Lisa Lockyer, Director Legislative Affairs toured Professor Pascale Ehrenfreund, President of ISU, and Ken Davidian.



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