



AeroSpace FRONTIERS

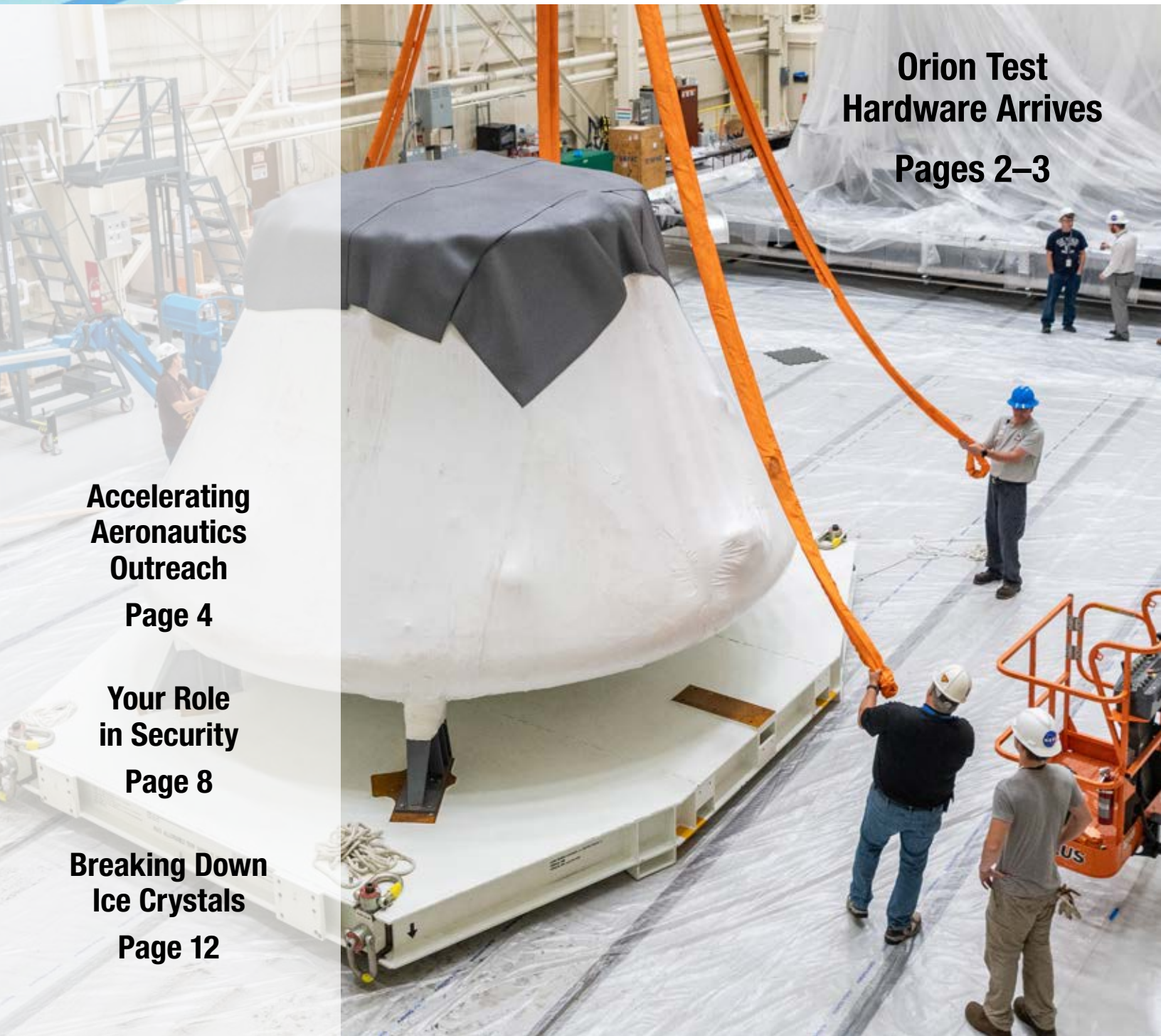
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Congratulations on a Successful Safety Audit

The Glenn Research Center was recently reviewed in a comprehensive, 6-day institutional, facility and operational safety audit, and we did very well! The results were encouraging, as we significantly reduced our noncompliance findings and we had no catastrophic or critical discoveries. We made progress in the areas of explosive safety, facility system safety and lifting devices while, once again, demonstrating sound practices in mishap reporting, pressure vessel verification and fire protection.

Thanks to the entire Glenn team for creating a healthy safety culture.

AeroSpace Frontiers

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Submit short articles and calendar items to the editor at doreen.b.zudell@nasa.gov.

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Plum Brook Performs Acoustics Test on Orion Crew Module

In late August, the team at Plum Brook Station's Space Environments Complex (SEC)—formerly the Space Power Facility—welcomed a test version of the Orion crew module. This crew capsule will be used during an in-flight, full-stress test in April 2019, known as Ascent Abort-2 (AA-2). The flight test will verify the Orion spacecraft's launch abort system can pull the crew to safety in the event of an emergency.



Photo by Bridget Caswell
GRC-2018-C-05564



Glenn's Deputy Director of Space Flight Systems Joel Kearns briefs the media prior to the acoustic test of the Orion Ascent Abort-2 crew module.

Left to right, NASA Johnson's Jon Olansen, Glenn's Nicole Smith and Lockheed Martin's Larry Price were also on hand to speak with the media.

The primary goal of the acoustics test at SEC's Reverberant Acoustics Test Facility was to provide the flight test team with structural response data and check out the developmental flight instrumentation within a realistic acoustic environment.

"During the test, we applied a known external acoustic field—which gradually increased throughout the test, eventually peaking at 155 decibels—to measure the response of the vehicle's structure and components," said Nicole Smith, project manager for Orion testing at Plum Brook. "The test verified the crew module's workmanship and avionics, while confirming there were no off-nominal issues."

Following a post-test inspection of vehicle and its avionics systems, the test module returned to Johnson Space Center for further preflight preparations before it heads to Kennedy Space Center for launch.

Prior to the start of testing, NASA and Lockheed Martin personnel met with several local media members at SEC to discuss the Orion program's AA-2 acoustic test and future milestones as NASA approaches the launch of Exploration Mission-1.

Smith, along with NASA Glenn's Joel Kearns, deputy director of Space Flight Systems; Jon Olansen, from NASA Johnson's Flight Test Management Office; and Lockheed Martin's Larry Price, Orion deputy program manager, discussed the importance of the prelaunch tests conducted at Plum Brook.

"Plum Brook is a specialized space facility that was built to do this," Kearns said. "Tests are performed here on the ground to see if large spacecraft hardware is designed properly before putting it in space."

To learn more about the AA-2 test of Orion's Launch Abort System, visit <https://www.youtube.com/watch?v=6HK9G7feXEK>.

By Jimi Russell and Doreen Zudell

At left:

After unwrapping the test module from its packaging, engineers and technicians prepare to move the Orion Ascent Abort-2 test article into the Reverberant Acoustic Test Facility.

GRC-2018-C-05523



On the Cover:

Technicians make final adjustments before lifting the test version of the Orion Ascent Abort-2 crew capsule at Plum Brook Station's Space Environments Complex.

Photos by Rami Daud
GRC-2018-C-05455

Facebook Viewers Step Inside the Reverberant Acoustic Test Facility

Photo by Bridget Caswell
GRC-2018-C-05581



Smith, left, and Welch bring Facebook viewers up close with the world's largest test chamber.

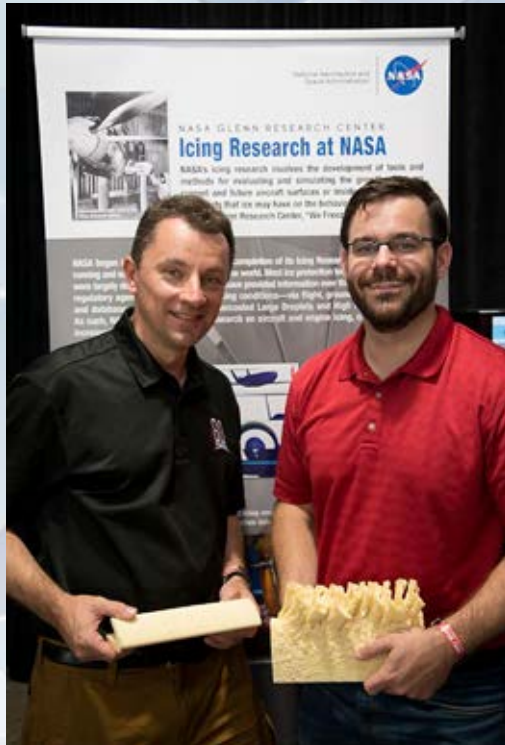
Glenn's Digital Communications team took Facebook Live users inside the world's most powerful spacecraft acoustic test chamber, as NASA prepared to test a full-scale test version of the Orion spacecraft crew capsule.

On Aug. 21, Digital Communications Lead Nikki Welch joined Nicole Smith, project manager for Orion testing at Plum Brook, in the Reverberant Acoustic Test Facility within the Space Environments Complex (SEC) at Plum Brook Station. Smith shared details about the facility and its role in verifying that Orion's launch abort system operates as predicted in the event of an emergency. This crew capsule will be used during an in-flight, full-stress test in April 2019, known as Ascent Abort-2 (AA-2).

"Live social media events are extremely beneficial to helping us educate people about Glenn's work," said Welch. "We can reach thousands of people, located around the world, and answer their questions in real time."

Explore more of the SEC in this 360-degree virtual tour, nasa.gov/specials/sec360/.

Delivering Exceptional Aeronautics Outreach



GRC-2018-CN-00035 Photo by Andrew Carlsen, NASA HQ

Glenn staff, Peter Struk and Christopher Porter, highlighted research in Glenn's Icing Research Tunnel.

NASA had a strong presence at AirVenture 2018, the Experimental Aircraft Association's Fly-In Convention in Oshkosh, Wisconsin. As the agency lead, Glenn's Office of Communications and External Relations played a major role in exhibit management, performing the design, fabrication, logistics and operational support of NASA's largest annual aeronautics exhibit. Carlos Gomez and John Oldham led this effort, while several of Glenn's subject matter experts delivered presentations on their research. Aeronautics Research Director Dr. Rubén Del Rosario participated in a NASA Aeronautics panel discussion and completed a Spanish-language live Periscope on Twitter for NASA's Hispanic social media account. Senior Public Affairs Specialist Jimi Russell and Chief Pilot Jim Demers did a Facebook Live about Glenn's S-3B Viking research aircraft. Finally, Robin Pertz, from Glenn's Science and Engineering Library, distributed books from the History Office. Glenn staff also participated in several media interviews highlighting NASA's presence at the event and Glenn's aeronautics projects, including aircraft icing, electric aircraft propulsion and supersonics research.

NEWS AND EVENTS

Parents Show and Tell for a Special Group of Visitors



Photos by Bridget Caswell
GRC-2018-C-04163

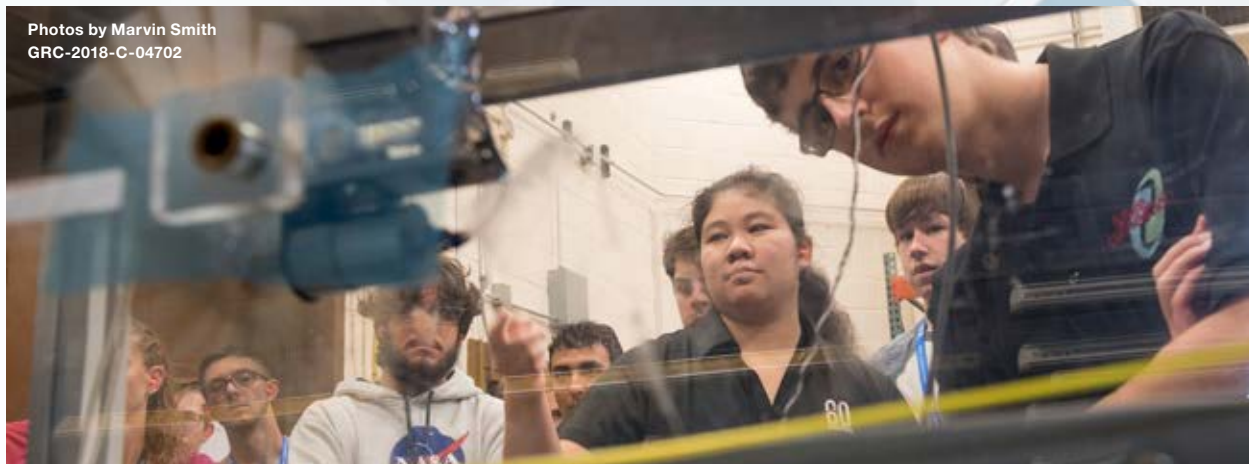


GRC-2018-C-04209

Glenn staff had the opportunity to talk about some of the exciting work they do with a special group of visitors—their children and grandchildren! The 2018 Take Our Children to Work Day event, July 13, kicked off with presentations, followed by hands-on activities and facility tours in the afternoon. This event allowed parents to show their children the work they do, share information about NASA's research and expose young minds to STEM careers. Glenn's Office of Diversity and Equal Opportunity sponsored the event with help from employees across the center.

Students Immerse in Project Challenge

Photos by Marvin Smith
GRC-2018-C-04702



The Facilities, Test and Manufacturing Directorate invited summer interns, Pathway interns and technician apprentices across the directorate to participate in an immersive student challenge, July 23 through Aug. 3. As part of the directorates' Summer Student Challenge, three teams competed to characterize a wind tunnel, which included designing, fabricating, testing and presenting their results for a ram air turbine prototype. The teams were given a standard suite of hardware, access to 3D printers and clear success criteria. Project Coordinator Lori Arnett, chief of the Data and Systems Branch, said the challenge provided an opportunity for students to network, collaborate, gain hands-on experience and develop a test bed for training new personnel. Sean Currie, an early career NASA employee, and Eric Insana, a Pathways intern, served as the day-to-day technical advisors during the challenge.



GRC-2018-C-04715

GRC Golf Outing: Rain and Shine



Gerry Todorovitch, Bud Todorovitch, Ray Barnett and Ron Rubal shot 61 (11 under).



David Plachta, Keith Gaydosh, Tim Ruffner and Rob Button shot 57 (15 under).

Two hundred forty golfers endured a little afternoon rain and thunder but had a lot of fun at the 9th Annual GRC Golf Outing at Mallard Creek Golf Course on Aug. 10. Four-person scramble participants ended the day with BBQ chicken and steak and great conversation about their successes and near misses. At left are this year's winning teams.

Photos by Quentin Schwinn
GRC-2018-C-05057
GRC-2018-C-05058

New Names for Plum Brook Facilities

Space Environments Complex

The Space Propulsion Facility at Plum Brook Station in Sandusky has been renamed. Now known as the Space Environments Complex (SEC) it continues to house the largest and most powerful space environment simulation facilities in the world.

- Within the SEC, the Space Power Facility name will continue to describe the thermal vacuum chamber part of the complex. This chamber, 100 feet wide and 122 feet tall, also hosts the world's largest electro-magnetic effects test capability.
- The Reverberant Acoustic Test Facility is the world's most powerful spacecraft acoustic test chamber, which can simulate the noise of a spacecraft launch up to 163 decibels or as loud as the thrust of 20 jet engines.
- The Mechanical Vibration Facility is the world's highest capacity and most powerful spacecraft shaker system, subjecting test articles to the rigorous conditions of launch.
- To take a virtual tour of the SEC, visit the link below.
nasa.gov/specials/sec360/

In-Space Propulsion Facility

Formerly known as B-2, the In-Space Propulsion Facility (ISP) is still the world's only facility capable of testing full-scale, upper-stage launch vehicles and rocket engines under simulated high-altitude conditions. Test articles can be exposed for indefinite periods to low ambient pressures, low-background temperatures and dynamic solar heating to simulate the environment of orbital or interplanetary travel.

"SEC is more than just a thermal vacuum chamber," said PBS Director Dave Stringer. "The three combined capabilities make it that much more unique."

"NASA Stennis Space Center also has a facility named B-2, so by naming ours ISP, we avoid confusion."



GRC-2018-CN-00041

Employees Gather for Appreciation Social at Plum Brook

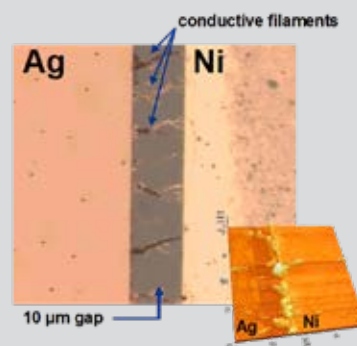
Civil servant and support service contract employees from across Plum Brook Station (PBS) took a well-deserved break to enjoy good food and conversation during their annual lunch gathering on Aug. 9. PBS Director Dave Stringer and TFOME PBS Site Manager Tom Mears kicked off the feast by thanking employees for their dedication throughout the year.



Trending With Tech Transfer

Shape Memory Alloys

Fort Wayne Metals, Indiana, signed two evaluation licenses for NASA Glenn's Shape Memory Alloy Training Stabilization Method and Training Apparatus. At the same time, they entered into a companion Space Act Agreement to transfer the technology for stabilizing shape memory alloy performance in conventional wire and structural forms. The Space Act Agreement allows a Glenn subject matter expert or researcher, to work directly with Fort Wayne Metals engineers to determine current material states for two of their product lines.



Radio Frequency and Advanced Communications

Glenn has awarded a startup license to FABAEARTH, a California-based company, for radio frequency and advanced communications technologies. This license includes technologies from NASA's Glenn, Jet Propulsion Lab and Goddard. With the licensed technology, FABAEARTH will provide both national and regional wireless infrastructure. The company is designing a network of unmanned, high-altitude aircraft that will enable the wide-area transmission of telecommunications services at a very low cost.



Photo by Marvin Smith
GRC-2018-C-04613

OHCM Wins 2018 Golden Shoe

Center Director Dr. Janet Kavandi recently presented the 2018 Golden Shoe Award to the Director of the Office of Human Capital Management (OHCM), Lori Pietravoia, for OHCM's most improved participation rate of 11 percent. A team from the Facilities, Test and Manufacturing Directorate was a close runner up with a 10 percent increase in participation, followed by the Safety and Mission Assurance Directorate (SMAD). This year's annual walk was held June 27 at Plum Brook Station, and June 28 at Lewis Field during Glenn's Safety and Health Awareness event. Thanks to all who participated and supported the event!

Pictured, left to right, SMAD Deputy Director, Gus Martzaklis; SMAD Director Anita Liang; Pietravoia; and Dr. Kavandi.



GRC-2018-CN-00043



GRC-2018-CN-00044



Photos by Doreen Zudell
GRC-2018-CN-00044

Security Day 2018

Working Together To Protect Yourself and Others

Everyone plays a role in security. To drive home this theme, NASA Glenn's Office of Protective Services hosted its third annual Security Day at Lewis Field, Aug. 7. Local fire, law enforcement and emergency medical services personnel joined Glenn employees and summer interns for speaker presentations, breakout sessions and vendor demonstrations that addressed a variety of timely security-related issues.

During her welcoming address, Chief of Protective Services Christi Tomaro thanked all those who helped make this event possible. "This enables us to continue to build and foster partnerships at the center and within the community."

During the opening session, former police officer and retired fire chief Rick Laskey used humor and compassion to convey the message of making a difference in the lives of those we serve. Former U.S. fire administrator and current National Fire Protection Association (NFPA) Regional Director Chief Greg Cade stressed the importance of coming together as a community to address hostile events under the NFPA 3000 Standard.

"Everyone here makes a difference," Laskey told the audience. "Each day we need to ask ourselves: Who am I going to help today? How am I going to make a difference?"

Tomaro recognized three individuals for their partnership in supporting NASA's mission by assisting the Office of Protective Services during key events, such as the open house and solar eclipse. They include Mark Williams, Transportation Security Administration; Patrick Shaw, Department of Homeland Security; and Thomas Maund, Brook Park Fire Department.

After a break, participants had another opportunity to visit vendor booths. They then attended breakout sessions on the topics of managing change, active shooter and the opioid crisis in Northeast Ohio. Tours were provided to off-site participants.

By Doreen B. Zudell



GRC-2018-C-05154

Photos by Bridget Caswell

Laskey used humor and compassion to convey the message of making a difference in the lives of those we serve.



GRC-2018-C-05166

Cade stressed the importance of coming together as a community to address hostile events under the NFPA 3000 Standard.



GRC-2018-C-05170

Williams, Transportation Security Administration, was one of three individuals from outside agencies who have supported Glenn's Office of Protective Services during key outreach events. Pictured, left to right, Williams, Center Operations Director Robyn Gordon and Chief Tomaro.



Glenn's BPW Chapter Awards Two Scholarships



BPW's scholarship chairperson, Jill Noble, far left, and President Nan vonDeak, far right, with scholarship winners, DeRoche and Collins.

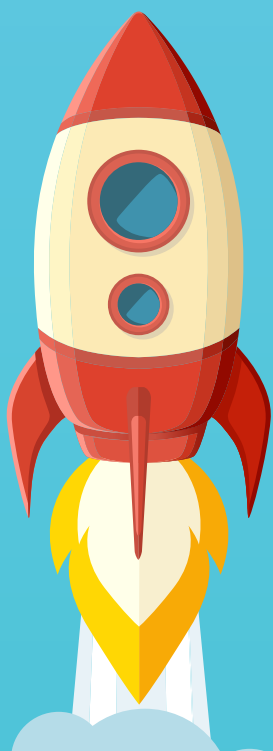
NASA Glenn's chapter of the Business and Professional Women (BPW) organization presented a Career Advancement Scholarship to **Sarah DeRoche** and **Hilary (Jill) Collins** during its annual Scholarship Banquet, Aug. 15. The scholarships are an integral part of the BPW mission to positively impact working women—professionally, politically and personally.

DeRoche, a Pathways Intern in Glenn's Procurement Division, received a \$500 scholarship towards completing a bachelor's degree in Business Administration at Kent State University. Her pursuit represents an opportunity for career advancement as a full-time NASA employee and the chance to be the first in her family to earn a college degree.

Collins received a \$250 scholarship to aid a career transition to nursing. An alumnus of John Carroll University, Collins has returned to college full time after working for the OSU Extension Service, Office of Sustainability, and the Cleveland Botanical Garden. Aiding her transition supports BPW's mission to advocate and empower women to achieve their full potential.

An induction ceremony for the 2018–2019 chapter officers followed the scholarship presentations. New officers include Amanda vonDeak, president; Nuha Nawash, vice president/programming; Jill Noble, vice president/membership; Annie Schaft, treasurer; and Erline Trsek, secretary.

For more information on BPW, contact Amanda.L.vonDeak@nasa.gov or Jill.D.Noble@nasa.gov.



Help a Student Launch a Bright Future

Glenn's Office of Education is partnering with several organizations in Cleveland to provide mentors and tutors for students who need extra help and encouragement to attain their full potential. Each of these programs is a little different in how they work and the time commitment required. Most programs are available to civil servants, support service contractors and retirees. Training is available and many have an established study plan. Whether you are a scientist or an office assistant, work in a technical or nontechnical field, you are sure to find a program that interests you. It's fun and rewarding!

The 2018–2019 school year has begun, so visit the link below to learn about the programs that help students from kindergarten through college level. Contact Tim Dedula, 216–433–3668, for more information on how you can help a student launch a bright future.

<https://www.grc.nasa.gov/grc-edu/wp-content/uploads/sites/96/Mentoring-Tutoring-Guide-August-2016.pdf>

RETIREMENTS



Stegeman

David Buchanan, Advanced High Frequency Branch, Communications and Intelligent Systems Division, retired Aug. 31, 2018, with 14 ½ years of service.

Roger D. Meredith, Smart Sensing and Electronics Systems Branch, Communications and Intelligent Systems Division, retired Aug. 3, 2018, with 35 years of service.



Strohacker

James Stegeman, Space Communications and Spectrum Management Office, Space Flight Systems Directorate, retired Aug. 31, 2018, with 31 ½ years of service.

Robin Strohacker, Procurement Division, Center Operations Directorate, retired Aug. 3, 2018, with 40 years of service.

NEW HIRES



Hood

Janelle L. Hood is Glenn's new emergency management specialist in the Office of Protective Services, Center Operations Directorate. Hood brings over 25 years of experience in law enforcement, emergency medical services and emergency management. In this position, she will support Glenn's emergency management program developing plans, training and exercises beneficial to mitigation, preparedness, response and recovery actions.

MORE THAN A MEMORY



Woollett

Richard R. Woollett, 95, a 1992 retiree with 40 years of NASA service, died July 21. Woollett was an aerospace engineer who retired from the Inlets Technology Branch, Propulsion Systems Division, where he helped improve propulsion systems for both subsonic and supersonic aircraft. He investigated compatibility of aircraft engines with the inlet and airframe, key to design and specifications by airframe and engine manufacturers. Woollett also served several terms as an area vice president of the Lewis Engineers and Scientists Association.



Sustainability Event: ALTERNATIVE TRANSPORTATION

Wednesday, Sept. 26

Noon to 1 p.m.

Small Dining Room, Building 15

Interested in learning more about alternative transportation options in your community? Come hear about sustainable transportation options and potential future projects in the Cleveland area from the Northeast Ohio Areawide Coordinating Agency (NOACA).

Beverly Burtzlaff, NOACA, will give a 1-hour presentation on this topic on Wednesday, Sept. 26.



Upcoming Center Events



NASA's 60th Anniversary

Mark Your Calendar!

Celebrate at Great Lakes Science Center

Saturday, Sept. 29

10 a.m. to 5 p.m.

NASA Glenn will host a special anniversary celebration in its Visitor Center at Great Lakes Science Center in downtown Cleveland.



The event is open to the public and will feature science demonstrations and an appearance by former astronaut Gregory H. (Box) Johnson. General admission rates to the Great Lakes Science Center will apply; however, NASA civil servant employees receive free general admission with ID badge.

Visit <http://greatscience.com/> for more details.



GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 23 through Sept. 20; building 49 from Sept. 25 to Oct. 4; and building 54 from Oct. 9 to 18. A Glenn reference librarian will be ready to assist employees with subject searches, finding specific books and articles and other information needs on the spot.

POC: Robin Pertz, 3-5776

OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct an outdoor mass notification "voice" test at building 39 on Wednesday, Oct. 3, at Lewis Field. An audible siren test on the "severe thunderstorm" tone will be conducted on Saturday, Oct. 6, at Lewis Field.

POC: Allen Turner, 3-6826

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, Oct. 10, noon, in the Glenn Employee Center's Small Dining Room.

Feds Feed Families Food Drive

• Now through Oct. 18! •



Federal employees are coming together once again for this year's Feds Feed Families campaign, which runs through Oct. 18. Help NASA Glenn achieve our donation goal of 10,000 pounds of nonperishable food items! Donations will be collected in the building 15 cafeteria and various locations around the center. Stay tuned to *Today@Glenn* for more information!

POC: Eliot Aretskin-Hariton, 3-2456, or eliot.d.aretskin-hariton@nasa.gov

Deadline for next calendar section is **Sept. 19, noon**. News and feature stories require additional time.
NASA Glenn Employees: For more calendar information, visit <https://wing.grc.nasa.gov/event-calendar/>.



Breaking it Down: NASA Takes a New Approach to Ice Crystal Icing Research

NASA Glenn researchers are going back to basics to probe deeper into the physics of high-altitude ice crystal icing.

Measuring the conditions that lead to a buildup of ice crystals inside an engine has been a challenge, according to Peter Struk, Icing Branch.

"You can't come in with probes to measure exact concentrations of water and ice particle sizes because you can't block the airflow into the engine," he said. "We wanted to figure out a way to do the same type of test, but expand it with a bigger area so we can better understand what is happening."

The answer was to go back to the fundamentals and conduct a dedicated test to simulate the high-altitude ice crystal environment outside of the engine.

"When you are trying to understand the physics of a problem, you need to break it down into the simplest possible fashion," said Struk, who led the fundamental test this summer.

A research wing was then exposed to an icing cloud simulating the in-flight conditions in a free jet, unattached configuration in NASA Glenn's Propulsion Systems Laboratory. Multiple new instrument traversing systems allowed researchers to use various probes during the test to record particle size, water content and temperature.

Pressure and temperature were replicated with the data from computer models and measurements of previous aircraft engine tests. Computer simulations were then used to estimate airflow velocities.

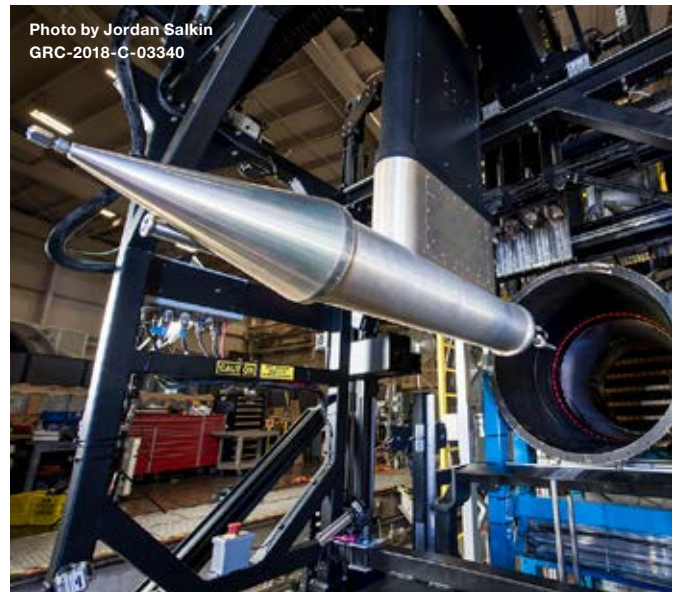


Photo by Jordan Salkin
GRC-2018-C-03340

Multiple new instrument traversing systems allowed researchers to use various probes during the test to record particle size, water content and temperature.

"We've been able to vary conditions in the test to see how individual parameters affect icing," said Struk. "Understanding this can lead to predicting icing patterns on future flights."

Tests such as this will allow researchers to build databases with the various conditions and their possible ice formations.

Glenn researchers are hopeful that these predictions can be used to design an engine model to reduce ice crystal icing during future flights.

By Victoria Segovia

Emergency and Inclement Weather Lines

Lewis Field: 216-433-9328 (WEAT)
Plum Brook Station: 419-621-3333

Connect With Glenn

