National Aeronautics and Space Administration

AeroSpace FRONTIERS

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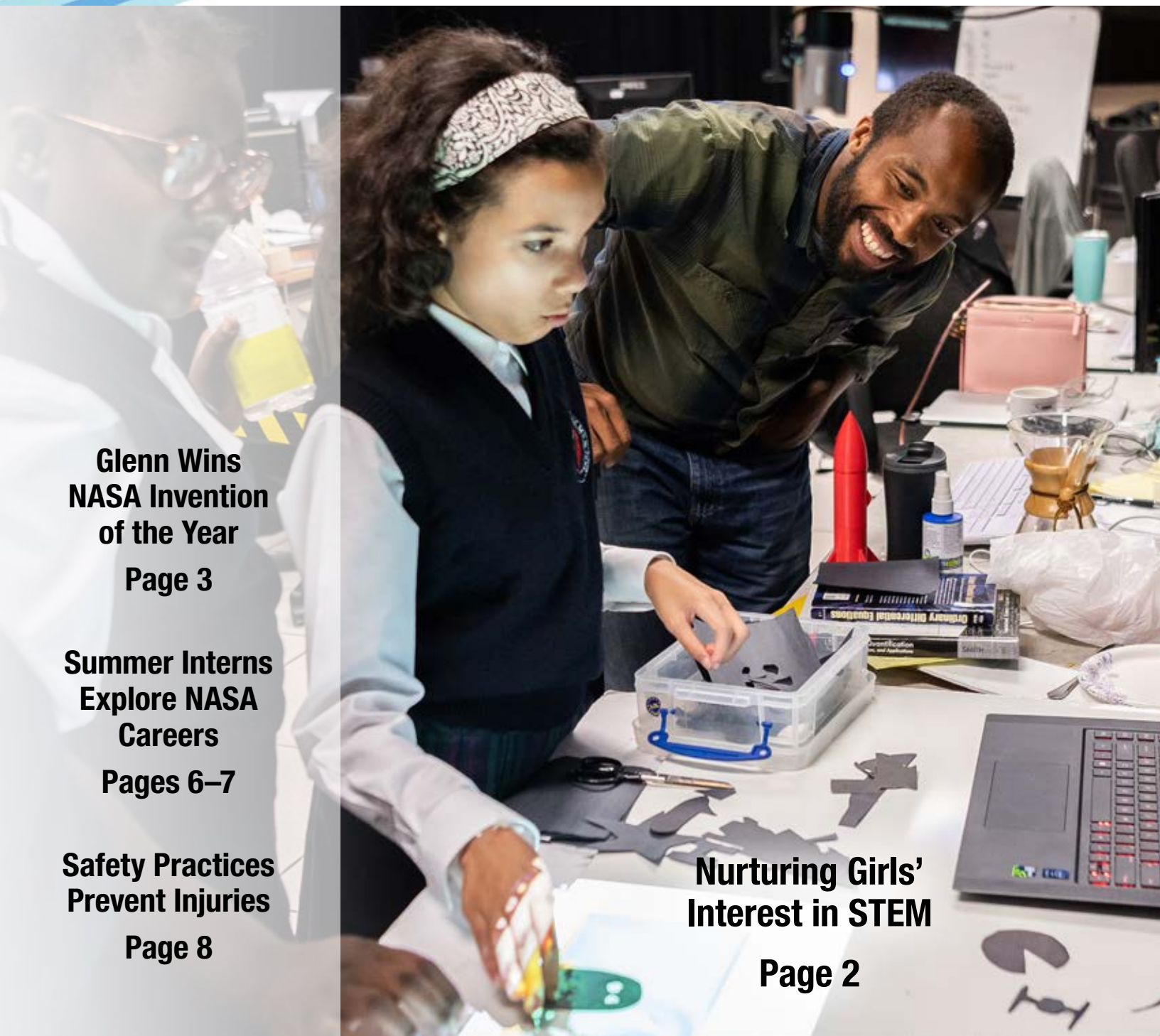

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Successful Testing for Commercial Crew Vehicle at Plum Brook Station

SpaceX's Crew Dragon arrived at Plum Brook Station on June 20, and in less than 3 weeks, it underwent thermal vacuum testing in the In-Space Propulsion Facility and modal and reverberant acoustic testing in the Space Environments Complex. The successful testing verified vehicle performance in extreme space conditions. Glenn team members worked cohesively while attending to safety practices in facility preparation, test operation and Crew Dragon transport. I am proud of our team for a job well done, and for demonstrating the capabilities of our unique assets to our industry partners.

Mission success relies on preparation, testing and execution—with Safety in mind.

AeroSpace Frontiers
is an official publication of Glenn Research Center, National Aeronautics and Space Administration. It is published the second Friday of each month by the Office of Communications & External Relations in the interest of the Glenn workforce, retirees, government officials, business leaders and the general public.

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

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Photos by Bridget Caswell

Event Introduces Girls to STEM Careers

NASA Glenn hosted its fourth annual Girls in STEM event at Lewis Field on July 12. The event offered 170 students who participate in scouts, summer camps and out-of-school-time programs in grades 6 through 8 insight into science, technology, engineering and mathematics (STEM) careers. Students met NASA's scientists and engineers, who encouraged the girls to think about STEM professions.

Activities included a panel discussion about careers in STEM, followed by an engineering design challenge, make-it-take-it activities and several tours. Students created energy storing bead bracelets that harnessed the Sun's power; made a liquid cooling and ventilation garment that keeps astronauts at a comfortable temperature; constructed a handheld rocket and built a robotic arm effector.

Glenn's Office of Education coordinated the event with assistance from employees across the center.

On the Cover:
Glenn's Calvin Robinson demonstrates to Girls in STEM participants how Augmented Reality can be used to visualize 2D fluid dynamics in real time.

Photo by Rami Daud
GRC-2018-C-04434

Glenn Earns Agency's Prestigious

Invention of the Year Awards

NASA's Inventions and Contributions Board has selected Glenn's PS/PM400, a new high-temperature solid lubricant coating for high-temperature wear applications, as the 2018 Government and Commercial Invention of the Year winner.

Dr. DellaCorte

Edmonds

The coating process for PS400.

GRC-2018-C-04455
Photo by Rami Daud

Shaft (enlarged to show detail) coated with NASA PS400 solid lubricants. The five banded sections shown represent the coating process steps.

"NASA Glenn is a world leader in developing advanced materials for extreme environments. Over the past several years we have worked very hard to get our technologies out to industry to boost American economic competitiveness," said Dr. John Sankovic, director, Office of Technology Incubation and Innovation. "Being recognized to win both the NASA Government and NASA Commercial Invention of the Year is a tremendous recognition of our efforts."

Senior Technologist Dr. Christopher DellaCorte, and recent retiree Brian J. Edmonds, are the inventors of PS/PM400, a novel, self-lubricating alloy material developed specifically for coating superalloys, applicable in many NASA technologies. PS400 is the coating version of the lubricant composite applied via plasma spray (PS) techniques, while PM400 is the free-standing solid version of the lubricant composite made via powder metallurgy (PM) processes.

The versatile alloy performs in temperatures from cryogenic levels, approximately –150 C, to greater than 900 C. It has been formulated to provide high density, smooth surface finish, and excellent dimensional stability with low complexity and expense in fabrication. This alloy is a significant upgrade over not only traditional lubricants such as oil and grease, but also solid lubricants like graphite or other carbon-based composite materials.

This innovation offers immediate benefits for numerous applications already operating in high-temperature environments, such as rocket engines, aircraft turbines and steam generation. It is widely used in foil air bearings for aircraft, as well as in other types of bearings, bushings and valves supporting state-of-the-art NASA engine design. Glenn's licensees ADMA Products Inc. and Hohman Plating are actively promoting and developing this technology for the automotive industry in applications such as exhaust-system parts and gas recirculation valves. Our licensees are also working with unmanned aerial vehicle manufacturers, large equipment manufacturers and companies needing a high performing material.

By S. Jenise Veris

More information about PS/PM400 is available at **https://technology.grc.nasa.gov/featurestory/ps-pm400**.

Conversations Change Misconceptions

In recognition of LGBT Pride Month, Glenn's Rainbow Alliance Advisory Group and the Office of Diversity and Equal Opportunity hosted a discussion on "The Power of Conversation," June 20. Candace Gingrich of the Human Rights Campaign talked about the importance of engaging in respectful conversation in advancing Lesbian, Gay, Bisexual, Transgender and Questioning (LGBTQ) equality in the workplace. Drawing from her personal and professional experiences, Gingrich explained how the power of everyday conversations change misconceptions. Center Director Dr. Janet Kavandi, and Office of Technology Incubation and Innovation Director Dr. John Sankovic, provided opening remarks of support. Rainbow Alliance members and supporters pictured, left to right, Christine Paulsen, Kelly Gilkey, Gingrich, Dr. Kavandi and Dr. Sankovic.

ACE Summer Campers Tour Glenn

NASA Glenn's Office of Education (OE) teamed with the Cleveland Aviation Career Education (ACE) Academy to host 19 middle and high school students, June 26, for a field trip devoted to creating an aviation experience. Darlene Walker, OE deputy chief, welcomed the students to the Briefing Center, where they were engaged in a discussion on aviation career opportunities presented by a diverse panel of Glenn engineers. The afternoon also included tours of the Graphics and Visualization Lab and the Simulated Lunar Operations Lab. Jerry Voltz moderated the panel discussion, which featured Lance Foster, Dionne Hernandez-Lugo, Jarred Wilhite and Diana Chan.

MOVE in the parade.

Photo by Quentin Schwinn
GRC-2018-C-04034

NASA Joins Medina's Bicentennial Homecoming

NASA brought space down to earth during the city of Medina's Bicentennial Homecoming, July 4 to 7. Former astronaut Mike Foreman made a special appearance, NASA's Journey to Tomorrow (JTT) traveling exhibit offered a hands-on learning experience and the Mobile Orion Vehicle Explorer (MOVE) took part in the annual July 4th Parade. Medina county native Foreman shared career highlights with the public, answered questions and signed autographs at the Medina Library. He later joined Glenn employees at the JTT exhibit at the celebration on the square. In recognition of NASA's 60th anniversary this summer, staff distributed "Golden Astronaut" tickets to tour Lewis Field on Sept. 29.

Photo by Rami Daud
GRC-2018-C-04035

Foreman interacts with the public in the JTT trailer.

Summer Interns Explore NASA Careers

Zoloty studies soil mechanics.

Zach Zoloty

Mechanisms and Tribology Branch
The Ohio State University, Aerospace Engineering, fourth year
Mentor: Margaret Proctor

As a long-time admirer of space travel and exploration, Zach Zoloty is excited to support NASA's missions in every way possible. In his fourth summer interning at NASA centers, Zoloty is confident that Glenn will offer an abundance of new experiences. With the volume of experiments and projects underway here, Zoloty knows there are opportunities to get involved and to learn from respected professionals.

Jones automates software for validation.

Khoranhlai Anjuli Jones

Multiscale and Multiphysics Modeling Branch
Xavier University of Louisiana, Computer Science and Computer Engineering, third year
Mentor: Trenton Ricks

Khoranhlai Anjuli Jones is stepping out of her comfort zone as an intern in NASA's work environment. With previous academic research experience, Jones believes that working at NASA is the best way to apply what she has learned in computer science to industry. She realizes that being trusted and empowered to design and implement algorithms to solve complex problems is an amazing opportunity.

Severino researches test engine noise reduction.

Jeffrey Severino

Acoustics Branch
University of Hartford, Mechanical Engineering in Acoustics, fourth year
Mentor: Danielle Koch

After serving as a research assistant to a NASA Glenn Faculty Fellow, Jeffrey Severino applied for Glenn's summer internship. Severino feels the most valuable lesson he is taking away during his time at the center is patience and persistence. This allows consistent learning and progress. Engaging with other interns and full-time employees is helping Severino understand how his work benefits the Acoustics Branch and Glenn's core competencies.

Kearns photographs students for the SCaN intern project.

Molly Kearns

Space Communications and Spectrum Management Office
The University of Alabama, Digital Marketing & Social Media, master's degree student
Mentors: Carrie Clapper and Ruth Scina

As a returning Space Communications and Navigation (SCaN) intern, Molly Kearns builds on her past work. This summer, that entails interviewing and documenting the contributions of her peers through photography and videography. Kearns is grateful to have the opportunity to work on a project that enables her to learn how other Glenn interns are contributing to NASA's mission.

This summer, NASA Glenn welcomed over 200 interns and fellows to its workforce. Glenn's internship program provides hands-on practical experience to expand students' education beyond the classroom. Students pursuing degrees in STEM and institutional areas have the opportunity to work side by side with career professionals and contribute to NASA's missions. Below are just a few from technical and professional disciplines.

Beverly works on a feasibility testbed.

Bill M. Beverly

Power Management and Distribution
Purdue University Northwest, Electrial Engineering Technology, third year
Mentor: Raymond Beach

Bill M. Beverly said one of the best decisions he has made is returning to school. With an abundance of work-life experience to contribute, Beverly feels learning is an everyday occurrence at NASA Glenn. Splitting his workday between his desk and the lab, Beverly is excited to build and repair equipment to be used in spaceflight. The chance to work in an eviornment that is like a close-knit family that is always ready to help, is making his summer unforgettable.

Calero assists with Girls in STEM 2018 event.

Johnny Enrique López Calero

Office of Education
University of Puerto Rico at Mayagüez, Material Science and Engineering, master's degree student
Mentor: Dr. Mark Kankam

NASA has offered Johnny Enrique López Calero a variety of challenges in the past. This year, he is stepping beyond his research-based experiences to manage student programs, work with different personalities and strive to keep every intern engaged. Calero enjoys meeting interns from different cultural backgrounds. He feels right at home at Glenn because of the Hispanic community presence.

Segovia, right, works with Jeannette Owens on a video project for NASA's 60th anniversary.

Victoria Segovia

Office of Communications and External Relations
Florida International University, Public Relations and Social Media and E-marketing, Graduate
Mentors: Frank Jennings and Jan Wittry

Interning at Glenn allows Victoria Segovia to combine her communications skills with her passion for science and discovery. Every day offers a different growth experience for Segovia. Immediately embraced by the staff, she writes and publishes content and coordinates activities in the areas of media relations, digital media and community outreach. One of her most exciting projects is sharing the stories of her fellow interns through this article for *AeroSpace Frontiers*. Segovia feels respected and treated as a peer.

By Victoria Segovia

216 high school and college interns and faculty fellows

107 colleges and universities represented across the nation

30 states where students live

115 mentors

Safety and Health Awareness 2018

Safety Practices Key to Preventing Injuries

Walheim highlights similarities of safety practices in space and on the ground while at Lewis Field.

While at Plum Brook, Allen shares lessons learned from his tragic accident.

Panelists, left to right, Dave Beaman, Steve Lilley and Jeffrey Nichols, address mishap case studies after presentations at Lewis Field.

NASA Glenn celebrated its annual Safety and Health Awareness Event in June with a variety of activities centering on the theme "No 1 Gets Hurt." Deputy Center Director Dr. Marla Pérez-Davis and Safety and Mission Assurance (SMA) Director Anita Liang opened the event by stressing that safety is an integral part of our daily activities.

"The work we do is risky, so it's important that we foster a culture of safety and speaking up," Pérez-Davis said.

Rex Walheim, former astronaut and the SMA Deputy Director at NASA Johnson; and Pete Allen, the SMA Deputy Director at NASA Marshall, served as keynote speakers at Lewis Field on June 26, and at Plum Brook Station on June 27. Walheim discussed the safety practices conducted in space to ensure astronaut safety, and highlighted the similarities to our safety practices on the ground. Allen shared lessons learned from a traumatic brain injury he suffered while at work, including how his accident affected co-workers and family.

After the presentations, NASA safety experts held a mishap case study panel. They addressed technical issues behind a faulty automotive ignition switch, a tooling mishap involving the Space Launch System liquid oxygen fuel tank at the Michoud Assembly Facility, and a deluge mishap that occurred at NASA Armstrong. Employees also visited information booths and interacted with safety and health experts who were on-site before and after the programs.

The awareness event concluded with the annual Golden Shoe Health Walk at Plum Brook, June 27, and at Lewis Field, June 28. Prior to the Lewis Field walk, a health presentation was given on "Stress Management for High Burnout Professionals."

By Doreen B. Zudell

Employees at Plum Brook, pictured, and Lewis Field, joined in the Health Walk.

Various information booths at Lewis Field, pictured, and Plum Brook displayed safety- and health-related items.

CFCLI Class of 2018 Graduation

Employees Partner With Other Federal Agencies

GRC-2018-CN-00030 Photo by ShaLonda Chisholm (DFAS)

Glenn's 2018 CFLCI graduates and Associate Director Janet Watkins, who provided management support, at the ceremony, are pictured front, left to right: Carrera (BRI), Watkins, Hoff; and back, Aretskin-Hariton and Webb.

The 2018 Cleveland Federal Community Leadership Institute (CFCLI), sponsored by the Cleveland Federal Executive Board, awarded graduate certificates to four Glenn employees, June 26. They completed the 9-month program designed to develop leaders from a broad cross-section of federal employees committed to advancing cooperation among federal agencies in the Greater Cleveland area, while strengthening community partnerships. Each of the graduates participated in a community service project in one of five targeted areas. The graduates and their project include:

Eliot Aretskin-Hariton and **James Webb** served on the STEM team that developed and taught a STEM lesson on how to design, manufacture and build a space rock launcher (catapult). They collaborated with the Mound Boys and Girls Club, which provided student participants; the Mound STEM school, which provided computers; and the Cleveland Public Library, which provided on-site manufacturing services via their mobile makerspace.

Flor Carrera served on the team that collaborated with the Benjamin Rose Institute on Aging to pilot a project, the Senior Buddy Program. This uses telephone outreach to establish supportive relationships to at-risk senior citizens in need of services via Rose's meal program.

Chas Hoff served on a team focused on connecting Cleveland-area veterans to fitness opportunities for increased physical activity and improved morale. They provided support to the Veterans Administration (VA) MOVE! Program through three combined initiatives. They created a comprehensive resource booklet for VA MOVE! participants; developed and advertised walking routes in and around the Cleveland VA Medical Center; and organized a Veterans Walking Challenge for all veterans and their supporters.

By S. Jenise Veris

Print, Electronic Media Teams Win Top Awards

GRC-2018-CN-00033 Photo by Victoria Segovia

AeroSpace Frontiers staff, left to right, Jami Drost, Doreen Zudell, Kelly DiFrancesco and S. Jenise Veris; with Digital Communications Team staff Nikki Welch and Nancy Kilkenny.

Two of NASA Glenn's Office of Communications and External Relations teams recently received awards of excellence for print and electronic media products.

The *AeroSpace Frontiers* Team and Digital Communications Team were recognized with Gold Awards of Excellence in the 2018 Communicator Awards contest. The newsletter team won in the category of Corporate Communications for Employee Publication. The Digital Communications Team won in the category of Science Website for the "Reinventing the Wheel" multimedia web feature. Additionally, the Digital Communications Team, with Dennis Brown, Rami Daud, William Fletcher and Joey Haas of the Imaging Technology Center (ITC), received a Grand Award from APEX Awards for Publication Excellence in the category of Electronic Media for the multimedia web feature.

In receiving these awards, both teams acknowledge the efforts of Glenn's ITC staff. The imaging and digital services were crucial to producing these award-winning products.

Schmidt Honored at Space Propulsion Conference

Dr. Schmidt

Dr. George Schmidt, Glenn's Propulsion Division chief, received the International Space Propulsion Award at the 2018 Space Propulsion Conference, May 21 to 25, in Seville, Spain. The award recognizes his high-quality contributions to the international space propulsion community over the last decade. Schmidt formerly served as Glenn's chief technologist and deputy director of the center's Research and Technology Directorate.

NTA Honors Okojie

Dr. Okojie, center, receives a Nsoroma Award presented by NTA vice president and Glenn scientist Dr. Bilal Bomani, left, and NTA president Dr. Lateef Saffore.

The Cleveland Chapter of the National Technical Association (NTA) recognized **Dr. Robert Okojie** as the 2018 Nsoroma Science honoree during its 16th annual Nsoroma Awards banquet, Ohio Aerospace Institute, June 8. Okojie, a senior research scientist, Smart Sensing and Electronics Systems Branch, primarily develops high-temperature microsensors enabling metal contact and packaging technologies. He currently holds 16 patents relating to high-temperature devices.

RETIREMENTS

Budinger

Henry

Switala

James M. Budinger, Architectures, Networks and System Integration Branch, Communications and Intelligent Systems Division, retired May 31, 2018, with 42 years of service.

Laura Henry, Office of Chief Counsel, retired July 31, 2018, with 34 ½ years of service.

Joe Switala, Wind Tunnel Test Branch, Facilities Division, retired May 26, 2018, with 27 ½ years of service.

Linda C. Elonen-Wright, Testing Division, Facilities, Test & Manufacturing Directorate, retired May 1, 2018, with 35 years of service.

PROMOTIONS

Jeziorowski

Luz Y. Jeziorowski has been selected deputy chief of the Safety and Health Division, Safety and Mission Assurance Directorate. She previously served as chief of the Occupational Health Branch within the division, while also leading the agency's Indoor Environmental Quality Group, a task she continues in addition to her new position.

MORE THAN A MEMORY

Black

Stephanie J. Black, 62, a 2018 retiree with 44 years of NASA service, died July 15. Black retired as the executive support assistant for the Office of Technology Incubation and Innovation. She is remembered for the "calm, effective and efficient manner" of performing her duties. Black earned numerous Special Act/Service Awards during her tenure, which she served primarily within the Space Flight Systems Directorate. She also earned a 2014 NASA Exceptional Administrative Achievement medal for improving the management support of the Space Operations Project Office.

Upcoming Center Events

2018 Center Picnic

Thursday, Aug. 23

11 a.m. to 2 p.m.

Lewis Field Picnic Grounds

Rain Date: Friday, Aug. 24
(same time and location)

Registration for lunch ticket closes
Monday, Aug. 13

Employees:
Check *Today@Glenn* for more details on this year's activities and Car Show!

POC: Betsy Lavelle, 216–433–3198

Retirees:
Registration ends Monday, Aug. 13.
Checks must be received by Wednesday, Aug. 15.

POC: Barbara Madej, 216–433–2305

ANNOUNCEMENT

Plum Brook Station
Columbus Avenue Security Gate
New Hours of Operation
Monday through Friday, 2 to 6 p.m.

Main Gate (Scheid Road)
Open 24 hours
All nonbadged visitors must use Main Gate.

FARMERS MARKET

Mark your calendar for the next Glenn Farmers Market on Tuesday, Aug. 14, 10:30 a.m. to 1:30 p.m., Lewis Field Picnic Grounds. Purchase fresh produce, homemade goods and more! Food trucks will be available. Some vendors only accept cash.

POC: Heather Mueller, 3–6313

GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 6 from Aug. 14 to 23. 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 audible siren test on the "tornado" tone on Saturday, Sept. 1, at Lewis Field. An outdoor mass notification "voice" test at building 15 will take place on Sept. 5.

POC: Allen Turner, 3–6826

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, Sept. 12, noon, in the Glenn Employee Center's Small Dining Room.

Deadline for next calendar section is **Aug. 22, noon**. News and feature stories require additional time.

NASA Glenn Employees: For more calendar information, visit **https://wing.grc.nasa.gov/event-calendar/**.

National Aeronautics and Space Administration

John H. Glenn Research Center

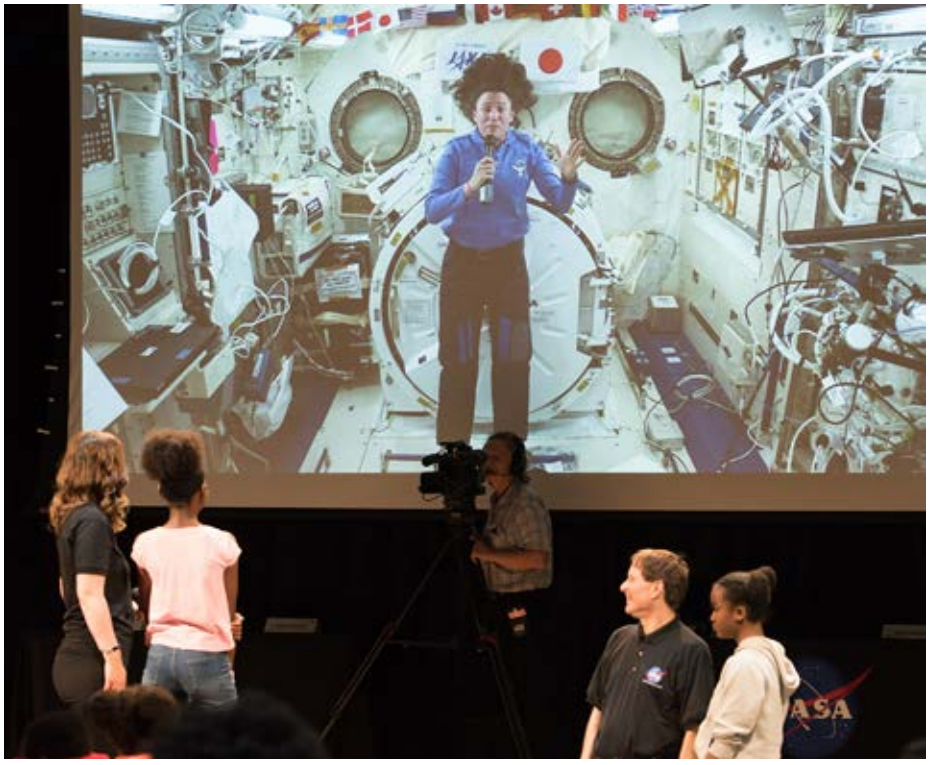
Lewis Field
21000 Brookpark Road
Cleveland, Ohio 44135

Plum Brook Station
3597 E. Scheid Road
Sandusky, Ohio 44870

www.nasa.gov

Read AeroSpace Frontiers online at http://www.nasa.gov/centers/glenn/news/AF/index.html.

Local Students Talk to Astronaut in Space



NASA hosted a live Earth-to-space call between local students and the International Space Station at Glenn on July 10. The 20-minute question-and-answer session at Lewis Field is part of NASA's Year of Education on Station.

During the call, several of the 35 eighth-graders from the Cleveland Metropolitan School District True2U program talked to astronaut Serena Auñón-Chancellor about living and working in space.

The event also included a design challenge using straws to build a long, strong structural truss; a career panel discussion; tours of the Simulated Lunar Operations (SLOPE) Laboratory to explore locomotion on planets; and demonstrations of augmented and virtual reality for space and aeronautics applications in the Graphics and Visualization Laboratory.

At top left: Students take turns asking Auñón-Chancellor about living on the space station.

Photo by Marvin Smith
GRC-2018-C-04543

At left: Students examine the mesh covering for a tire in the SLOPE Laboratory.

Photo by Bridget Caswell
GRC-2018-C-04494

Emergency and Inclement Weather Lines

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

Connect With Glenn