



AeroSpace FRONTIERS

VOLUME 20 • ISSUE 4 • APRIL 2018

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Test Facility Construction Awareness

Glenn Research Center is entering into the next phase of our construction in the 9-by-15 and 10-by-10 wind tunnels. A big thank you to the operations crew who have been attending to best safety practices with no incidents thus far. As we begin to move and install large hardware in these facilities, let us continue to be extra vigilant. Completion of the construction projects will result in enhanced capabilities to address acoustic and high-speed aeronautical challenges, and it is best accomplished by following processes and procedures that keep our workforce safe.

Thank you for your attention to safe operations!

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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Dr. Jaiwon Shin's Visit Focused on Future of Aviation

Associate Administrator of the Aeronautics Research Mission Directorate (ARMD) Dr. Jaiwon Shin visited Lewis Field, March 12 and 13. He met with senior leadership, toured facilities and held a town hall meeting where he presented ARMD awards.

Glenn Aeronautics Director Dr. Rubén Del Rosario announced the winners of the ARMD awards at the top of the town hall program. He stressed the significance of the awards, which recognize civil servants, support contractors and students/interns who demonstrate a profound positive impact and benefit to ARMD, its partners and/or stakeholders. Del Rosario and Center Director Dr. Janet Kavandi assisted Shin in presenting the awards.

Dave Arend, Inlets and Nozzle Branch, accepted the *Technology and Innovation Group Award* on behalf of the **BL12DTF (Boundary Layer Ingesting Inlet and Distortion-Tolerant Fan) Technology and Development Test Team**. The BL12DTF Team designed and built both the engine inlet and fan research hardware and made modifications to the wind tunnel to accommodate new hardware. A total of 104 hours of test time was accumulated, which resulted in a significant contribution toward understanding the impact and benefit of the BLI propulsor.

Top: Dr. Kavandi and Dr. Shin pose with members of the BL12DTF team present at the town hall. The team received the Technology and Innovation Group Award.



Tammy Turner, a Wichita Tribal Enterprises employee serving in the Program Resources Branch, Office of Chief Information Officer, received the *Program and Mission Support Individual Award*. As Aerospace Evaluation and Test Capability (AETC) portfolio’s lead business analyst, Turner has been instrumental in support of AETC’s transition to a New Funding Model. This involves the management support of resources from four mission directorates used across three NASA field centers to sustain the AETC portfolio of large wind tunnels.

In his town hall presentation, Shin focused on the future of aeronautics, with emphasis on the global growth of aviation. He cited examples of how both traditional and emerging markets are positioning themselves to compete in the future of aviation.

Shin talked about the significance of Urban Air Mobility, or UAM, and the global race to achieve leadership in this area. UAM is defined as a safe and efficient system for air passenger and cargo transportation within an urban area— inclusive of small package delivery and other urban Unmanned Aerial Systems services—which supports a mix of onboard/ground-piloted and increasingly autonomous operations.

“All of a sudden the air space is becoming extremely complicated,” he affirmed. Shin pointed to the value of the six strategic thrusts in ARMD’s Strategic Implementation Plan. They will continue to guide NASA’s research efforts in the next 25 years and beyond.

At the close of his presentation, Shin challenged employees to think about what NASA should be doing to address changes within the industry not only in 10 years—but in 5 years, and even today. NASA must maintain its technological preeminence, he said.

“We have to make sure we are leading the community and providing what is necessary to open up these emerging markets,” Shin said. “What we do today will lay the groundwork for our successors.”

Shin addressed questions from the audience and through the Conferences i/o Audience Response System.

By Doreen B. Zudell



GRC-2018-C-01322 Photos by Rami Daud

Dr. Shin and Dr. Kavandi present Tammy Turner, center, with the Program and Mission Support Individual Award.



GRC-2018-C-01334

On the Cover: During his recent visit to Lewis Field, Associate Administrator of the Aeronautics Research Mission Directorate Dr. Jaiwon Shin, left, toured the construction site of the 9- by 15-Foot Low-Speed Wind Tunnel. Upgrades are underway to enhance the tunnel’s capability for future aeronautics research. Also pictured is Lee Olson, Federal Aviation Administration liaison to NASA.

Partnership Nurtures Ecosystems at Plum Brook Station



BEFORE:
Area with heavy brush before clearing.



AFTER:
Area after heavy brush was cleared.



The Smooth Green Snake is an endangered species that exists at Plum Brook Station.

NASA Glenn's 6,454-acre Plum Brook Station (PBS) is home to a number of threatened and endangered plants and animals. Many of these species are found in unique habitats—ranging from prairie meadows to mesic forests to oak savannas—that are in need of ecological restoration and/or maintenance.

While PBS aggressively conducts species management and habitat restoration, a 5-year Space Act Agreement (SAA) with The Nature Conservancy (TNC) is helping PBS expand its efforts. TNC is a charitable environmental organization, headquartered in Arlington, Virginia, with the mission to “conserve the lands and waters on which all life depends.”

Under the SAA, signed in the fall of 2015, TNC would assist Glenn in several habitat-management activities. They include protecting the unique ecosystems at PBS from encroachment of invasive species, encouraging native vegetation and conducting habitat management at PBS in the interest of progressive environmental stewardship.

“Surveys were completed in 2016 to determine which flora and fauna are present at both Lewis Field and PBS,” said Bethany Eppig, Glenn’s Natural Resources Program manager. “We shared these surveys with TNC to collaboratively determine priority locations for expansion of our habitat enhancement efforts and began field work in the spring of 2017. This

partnership has resulted in 175 additional acres of habitat that has been managed at no additional cost to NASA.”

The area managed in partnership with TNC is a section of prairie that visitors pass, from the main gate to the Engineering Building. Most of the work centered on clearing brush that chokes the endangered and native species and prevents the sun from nurturing the plants. Future plans will expand efforts that reduce invasive grasses in wetlands locations, remove aggressive brush near the central meadow and remove rapidly growing invasive trees.

“Habitat enhancement does not occur overnight, it can take years, or decades, of work to achieve close to pre-settlement conditions,” Eppig said. “I’m excited to see the strengthening of Glenn’s continued commitment to environmental stewardship through our partnership with The Nature Conservancy and witness the physical improvements of these unique habitat areas in the years to come.”

Editor’s note: Christine Staschiak, a Pathways intern recently converted to civil servant, has worked with Eppig and the Natural Resources Program for the past two summers. She will be transitioning to lead for these efforts during the remainder of the partnership.

By Doreen B. Zudell



Dr. Johnson

Johnson, New NESc Technical Fellow

The NASA Engineering and Safety Center (NESc) has selected Dr. Dexter Johnson as the new Loads and Dynamics NASA Technical Fellow, effective Feb. 18. Johnson replaced Dr. Curt Larsen, who retired last year. NASA Technical Fellows are NASA’s senior technical experts, who assemble and provide leadership for the Technical Discipline Teams, and sponsor discipline-enhancing activities to educate the agency. The NESc represents an established knowledge base of technical specialists pulled from the 10 NASA centers and from a group of partner and organizations external to NASA.



GRC-2018-C-01301

Photos by Marvin Smith

Big Idea Challenge student finalists, advisers and judges pause for a group photo prior to a tour of Glenn facilities.

2018 Big Idea Challenge Inspires Creative Concepts

Twenty-four students came to Cleveland, March 6 and 7, for the final phase of the 2018 Breakthrough, Innovative and Game-changing (BIG) Idea Challenge, supported by NASA's Space Technology Mission Directorate (STMD) Game Changing Development Program. NASA, in partnership with the National Institute of Aerospace (NIA), chose five team finalists' proposals considered the most unique and potentially feasible surface solar array concepts for a power station on Mars from a total of 16 submitted.

Dr. John Sankovic, director of Glenn's Office of Technology Incubation and Innovation Tech Transfer, welcomed the students representing Norwich University, Princeton University, Texas A&M University, the University of Colorado Boulder and the University of Virginia. He encouraged their new ideas for getting to Mars and getting the data NASA needs in its quest for humans to explore beyond low-Earth orbit. "This is a really important aspect of innovation," Sankovic said. "The idea of having prizes and challenges, using open sourcing ideas and the new ideas in academia, is critical to what NASA needs to do in the future."

Team presentations were judged by a panel that included NASA Glenn's Fred Elliott and Jeremiah McNatt; Langley's Richard Pappa, and Headquarters' STMD members Dr. Robert Hodson and Lee Mason; and from the space industry, Space Systems Loral's Bao Hoang. They were looking for the winning concept that met the following criteria: included innovative design and creative operational approaches; utilized technologies, which could be ready for use on Mars in the early 2030s; included effective packaging for launch and Mars landing; and provided reliable, long-term power generation in the Mars environment.



GRC-2018-C-01232

Norwich University adviser and students with their winning solar array and packaging concept.

Norwich University emerged as the winning team for this year's competition with their "Norwich Inflatable Mars Solar Array (NIMSA)" concept. The University of Colorado's "MAFSA: Mars Autonomous and Foldable Solar Array" concept earned second place.

"Eligible members from both teams have been offered internships at Glenn," McNatt said, "and we look forward to continuing to develop their concepts this summer."

By S. Jenise Veris

More information and an archive of the presentation live stream is available at <http://bigidea.nianet.org/>.

Aiding America's Homeless and Veterans in Need



Did you know there are thousands of homeless veterans in the United States and that African-Americans rank the highest percent of that population?

Chaplain Willie J. Springer, pictured, a U.S. Army veteran of the Vietnam War, addressed these statistics and related how his own struggles motivated him to aid fellow veterans, during Glenn's Black History Month Observance, Feb. 27. Springer, Veterans Outreach coordinator for the city of Berea, shared his commitment to getting all veterans the resources they need for a better quality of life and challenged others to assist in the cause.

Photo by Rami Daud
GRC-2018-C-00869

NEWS AND EVENTS



GRC-2018-CN-00007

Photo by Doreen Zudell

Tech Expo Offers Latest Technologies

NASA Glenn's Office of the Chief Information Officer and the Research and Engineering Directorate, in partnership with the Procurement Division's Office of Small Business, hosted the 2018 Glenn Technology Exposition, March 1. The annual event offered demonstrations and presentations from a variety of companies showcasing the latest in emerging technologies. Employees could network with industry experts and share ideas and future goals.

Cavs Honor Trailblazers in STEM



GRC-2018-C-00649

Photo by Marvin Smith

As part of their Annual Black Heritage Celebration, the Cleveland Cavaliers shined the spotlight on three NASA Glenn trailblazers who have paved a path for African-Americans pursuing STEM careers, while supporting NASA's mission. During the halftime presentation, Feb. 28, the Cavs honored former Center Directors Donald Campbell and Dr. Woodrow Whitlow Jr. and current Director of Center Operations Robyn Gordon. They were recognized for breaking societal barriers for women and STEM professionals, as well as for motivating other minorities to pursue their dreams. NASA Glenn also provided STEM-related exhibits and activities for the public at Quicken Loans Arena during the event. Pictured, left to right, Campbell, Whitlow and Gordon with Cavaliers Director of Alumni Relations Campy Russell.

Toastmasters Clubs Go Virtual

The Aerospace Toastmasters Club at Glenn extended its reach outside northeastern Ohio when they participated in a joint virtual meeting with the California-based NASA Armstrong Toastmasters Club, Feb. 8. Using NASA video conferencing facilities, members took turns speaking and showcasing their diverse styles and skills. The meeting was part of Toastmasters' efforts to increase its use of digital technology to network among its members and attract new members.

To learn more about the Aerospace Toastmasters Club at Glenn, contact Dale Force, 3-3520.

Photos by Judith Majher
 GRC-2018-CN-00005
 GRC-2018-CN-00006





Glenn Wraps Up 2017 CFC

NASA Glenn's 2017 Combined Federal Campaign (CFC) yielded a total of \$307,230 in donations—ranking second out of 577 federal agencies in the Ohio CFC Zone 028 region! NASA Glenn also ranked second in volunteer time donated, with 1,858 hours. I'm proud of the hard work and dedication of our campaign team members, and grateful to all our employees who contributed to the many worthy causes in our local communities and beyond. Thank you for your generosity!

—2017 CFC Chair Dale Hopkins

PROMOTIONS



Dr. Griffin



Michalski



Wiedenmannott

Dr. Devon Griffin has been selected Glenn's Human Research Program manager in the ISS and Human Health Office, Space Flight Systems Directorate. Griffin previously served as project manager, Space Communication and Navigation Center for the Engineering, Networks, Integration and Communication project.

Patricia Michalski has been selected secretary in the Center Operations Directorate. For the past 8 years, Michalski has provided administrative support as a support service contractor. She previously served as an ATS/TIALS division support assistant in the Logistics and Technical Information Division.

Ulrich (Rick) Wiedenmannott has been selected chief of the Engineering and Operations Branch in the Facilities, Test and Manufacturing Directorate. He previously served as lead systems engineer for the assembly, integration and testing of the Universal Stage Adaptor for the Space Launch System in Plum Brook's Space Power Facility.

Glenn Employees Honored at the 2018 BEYA Conference



Dr. Goldsby



Lobo



Thomas



Welch



Dr. Williams

Five NASA Glenn employees were among those recognized for career accomplishments at the 32nd Annual Black Engineer of the Year Awards (BEYA) STEM Conference, held Feb. 8–10 in Washington, DC. The annual event brings professionals and students from a wide variety of STEM-related fields together for 3 days to share their experiences and information.

NASA Glenn honorees include:

Dr. Jon Goldsby, a research physicist in the Materials Chemistry and Physics Branch, received a Senior Technology Fellow award.

Mary Lobo, chief, Facility Management and Planning Office, received a Science Spectrum Trailblazer award.

Queito Thomas, an aerospace science technology lead engineer in the Aerospace Experimental Facilities and Test Technologies Branch, received a Science Spectrum Trailblazer award.

Nikki Welch, the web/social media lead in the Office of Community and External Relations, received a Modern Day Technology Leader award.

Dr. Tiffany Williams, a research chemical engineer in the Materials Chemistry and Physics Branch, received a Modern Day Technology Leader award.

Glenn Tests Aircraft Engines in Ice Crystal Environment

Sometimes ice can be good, like when it is cooling down a beverage on a hot day or when athletes are gliding over it at the Winter Olympics. However, when it forms inside an aircraft engine, the results can be damaging.

In January, testing began at NASA Glenn on an aircraft engine in a high-altitude ice crystal environment, to explore a relatively new phenomenon called ice crystal icing. This occurs when ice crystals found at high altitudes enter an engine's core and combine and grow, causing loss of thrust, engine stall, surge and potential damage due to ice shedding.

Glenn has partnered with Honeywell for this study to explore the characteristics of ice accretion within operating aircraft engines. "The Honeywell uncertified research engine was built to meet similar performance criteria as a family of Honeywell gas turbine engines," said Nicci Reising, Honeywell's test engineer at NASA Glenn. "These test results can be applied to future Honeywell aircraft engines."

"We are exploring the limits of how ice builds up within an engine and moving that ice to different locations to see how its behavior changes," said Ashlie Flegel, Glenn's engine icing

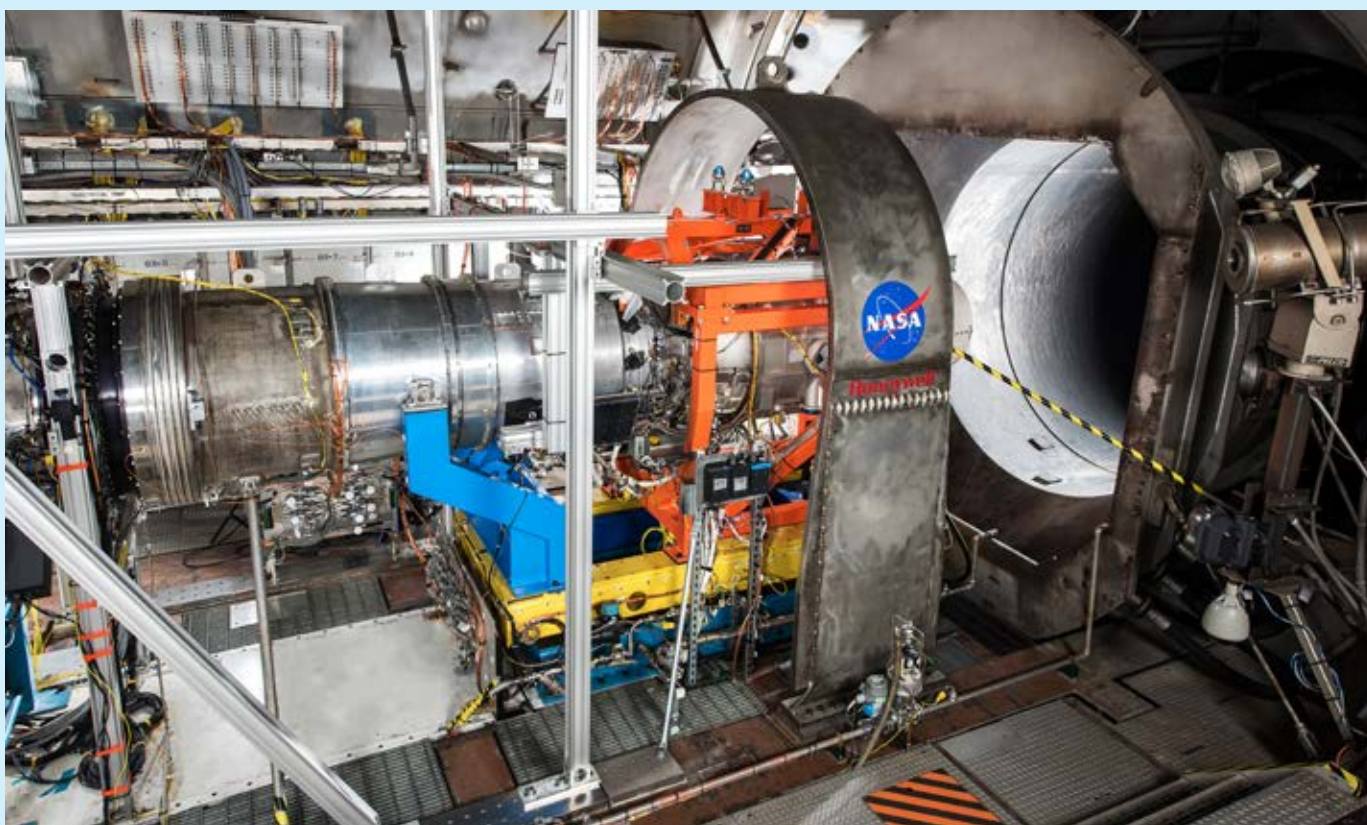
technical lead. "The test will also provide insight into how the ice particles are breaking up after passing through the fan."

The engine model used in this test does not have any known engine icing issues, so for this particular study NASA engineers have applied risk analysis to find conditions that cause engine ice to form. They then varied temperature, fan speed and ice content to observe how icing behavior changed and will use the collected data to enhance future engine designs by reducing icing risks.

"As new engine technologies strive for smaller cores that are highly efficient and lightweight, understanding how design changes impact the potential icing risk is crucial in order to maintain aviation safety," said Flegel.

The icing research being done at Glenn is one of a kind, and NASA currently has the only facility in the world that can test full-sized engines and rigs at relevant ice crystal icing conditions. As more planes enter the airspace and the likelihood of flying into icing regions increases, Glenn's icing research is of the utmost importance to the future of engine design and aviation safety.

By Debbie Lockhart



GRC-2018-C-00516

Honeywell's uncertified research engine installed in Glenn's Propulsion Systems Laboratory.

Photo by Jordan Salkin

RETIREMENTS



Brown



Medina



Reed



Rice



Williams

Danis J. Arthur, Space Environments Test Branch, Testing Division, retired April 3, 2018, with 40 years of federal service, including 36 with NASA.

Carl A. Brown, Occupational Safety Branch, Safety and Health Division, retired March 31, 2018, with 33 years of service.

Heriberto M. Medina, Space Environments Test Branch, Testing Division, retired April 3, 2018, with 42 years of federal service, including 40 with NASA.

Olen J. Reed, Aerospace Test Branch, Testing Division, retired March 30, 2018, with 29 years of service.

Rowena M. Rice, Occupational Health Branch, Safety and Health Division, retired March 30, 2018, with 30 years of service.

Raymond G. Williams, Aerospace Test Branch, Testing Division, retired March 30, 2018, with 29 years of service.

MORE THAN A MEMORY

Pitts: A Key Member of the PBS Space Environments Complex Operations



Pitts

Stephen Pitts, 52, a research laboratory mechanic at Plum Brook Station (PBS) for the past 17 years, died March 4. He was a Jacobs Technology Inc. employee working under the Test Facility Operations, Maintenance, and Engineering (TFOME) contract.

Pitts began working at PBS in 2000 under the Plum Brook Operations Support Group supporting many of the PBS test facilities as a mechanical technician prior to becoming a core member of the operations crew at the Space Power Facility (SPF). He specialized in test and facility hardware buildup, preparation and operation. By 2010, he became a highly qualified operator of the Space Environments Complex's critical space simulation systems. Most recently, he supported facility preparations and test operations for the Orion spacecraft's European Service Module qualification program.

"While Steve spent most of his time in the SPF, he generously shared his expertise with co-workers and projects in other areas on station," said Robin Brown, SEC facility engineer. "He will be truly missed."

MORE THAN A MEMORY



Heidmann

Marcus F. (Marc) Heidmann, 95, a 1980 retiree with 36 years of NACA/NASA service, died March 5. Heidmann contributed significantly to the center's power and propulsion research in liquid rocket combustion instability for the F-1 engine on Apollo's Saturn V rocket and on the Heidmann fan noise model to aid aircraft noise reduction. He co-developed the widely used Priem-Heidmann propellant vaporization model with Richard Priem. That work is chronicled in a series of papers that earned the 1973 AIAA Pendray Aerospace Literature Award. His son, Dr. James (Jim) Heidmann, works in Glenn's Aeronautics Directorate.



Richley

Edward A. Richley, 89, a 1994 retiree with 35 years of service, died March 8. Richley performed pioneering research and authored numerous reports on electric propulsion, which powered Space Electric Propulsion Test (SERT) missions from 1964 to 1970, and more recently, the Deep Space 1 and Dawn probes. He held a patent for an ion rocket engine and earned a NASA Exceptional Service Medal (1982). Richley advanced through several management positions before retiring as Director of Administration and Computer Services. He was a decorated U.S. Army veteran of the Korean War.

Upcoming Center Events

Sustainability 2018

Greening Glenn One Event at a Time

Earth Day, a global event, is celebrating 48 years on Sunday, April 22. To do our part, Glenn will once again bring awareness and education to NASA Glenn employees on ways to reduce pollution and embrace environmental best practices.

Earth Day Kickoff Event

Thursday, April 19, 1 to 2:30 p.m.

MIC (bldg. 162) Assembly Area

MC: Tom Hartline, Glenn's Sustainability Officer

Speaker: Jerry Crabb, Cleveland Indians' Senior Director of Ballpark Operations, "Sustainability Practices at Progressive Field"

POC: David Smith, 3-5109

Lewis Field Garlic Pull

Thursday, April 26, noon to 1 p.m.

Abram Creek by Duck Bank Road

POC: Christine Staschiak, 3-6662

Rain Barrel Workshop

Thursday, May 17, 11:30 a.m. to 1 p.m.

Picnic Grounds

POC: Stacey Yanetta, 3-6468

Presentation is free.

Pre-registration and materials fee are required for the workshop.

Sustainability Fair and Farmers Market

Tuesday, May 22, 10:30 a.m. to 1:30 p.m.

Picnic Grounds

POC: David Smith, 3-5109

Glenn will hold several more "Greening Glenn One Event at a Time" awareness and educational activities throughout the coming months. Stay tuned to *Today@Glenn* for details.



GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 77 through April 19 and building 86 from April 24 to May 3. 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

MAY OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct an outdoor "voice" test in building 87 at Lewis Field on Wednesday, May 2. An audible mass notification test on the "shelter and aid stations" tone will be conducted on Saturday, May 5.

POC: Allen Turner, 3-6826

NATIONAL DAY OF PRAYER

The NASA Glenn Prayer Group invites all members of the Glenn community to join them for a Christian observance, Thursday, May 3. This year's theme is "Pray for America—UNITY." Observances will be at 7:30 and 11:30 a.m. See *Today@Glenn* or type "Prayer" in the WING Transporter for locations and details.

POC: Dale Mortensen, 3-6823

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, May 9, noon, in the Glenn Employee Center's Small Dining Room.

Deadline for next calendar section is **April 18, noon**. News and feature stories require additional time.

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>.



Faces of Glenn

Our new portrait series highlighted some of the dedicated people who make our workforce one of the best in the nation. Join us on Instagram to learn more about the Faces of Glenn.



*"I know so many
people I've never met!"*

Cyndi Beverly
NASA Glenn Call Center Operator



Content by Nancy Smith Kilkenny

Photos by Rami Daud

Visit <https://www.instagram.com/nasaglenn/>

Emergency and Inclement Weather Lines

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

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