National Aeronautics and Space Administration

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Glenn Embraces Safety Culture

Along with the National Safety Council and many organizations nationwide, Glenn is rolling out Safety and Health Awareness throughout the month of June! From learning about the Columbia Crew Survival Investigation in the beginning of the month, to a well-orchestrated set of events in the week of June 24 involving discussions on Mission Operations Success, Fatigue Management, Integrative Health and Mishaps, and our annual Golden Shoe Health Walk, we are celebrating and reminding ourselves why safety holds a special meaning to each of us. As we face exciting challenges in our effort to enable exploration, our safety and the safety of those around us remain the most important!

Let's continue the safety rigor from June through the rest of the year.

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Acoustic Improvements to Wind Tunnel Ensure Long-Term Viability

Testing quiet fans for aircraft engines, especially future fan concepts, require a quiet wind tunnel.

GRC-2018-C-09741 Photos by Bridget Caswell

Upstream view of the corner 3 turning vanes, which efficiently turn the diffuser airflow 90 degrees to the left and absorb any noise that may be reflected back into the diffuser and test section.

On the Cover:

Facility Manager David Stark stands in the 9 by 15-Foot Low-Speed Wind Tunnel test section, with the diffuser and corner 3 turning vanes in the background, which underwent acoustic improvements.

GRC-2019-C-02861

GRC-2018-C-09739

The tunnel's diffuser, which helps to absorb any model-generated noise and slows the air exiting the test section over the diffuser length.

Glenn's 9 by 15-Foot Low-Speed Wind Tunnel (9x15 LSWT) is the only national facility that can simulate takeoff, approach and landing in a continuous subsonic environment. Used extensively to study and acoustically characterize nearly all of the NASA/industry propulsor concepts over the past 20 years, the tunnel recently completed acoustic improvements to ensure its long-term viability.

Built in 1969 in the return leg of the 8 by 6-Foot Supersonic Wind Tunnel (8x6 SWT), the 9x15 LSWT was originally used to support short takeoff and vertical landing (STOVL) aircraft model testing. In 1986, acoustic treatment was added to the test section to support engine fan testing and, except for maintenance, the acoustic treatment has remained essentially unchanged in 30-plus years.

Over the same 30-year period, engine fan noise has been reduced by about 1 decibel per year due to fan noise technology improvements. Historically, 9x15 LSWT acoustic testing was performed at Mach 0.1, which is below true takeoff and landing speeds, to take advantage of the lower background noise in the test section at this speed. Open rotors and other modern concept fans, however, will require testing at higher than Mach 0.1 tunnel speeds.

"The primary objective of the 9x15 acoustic improvement project was to reduce the background noise levels in the 9x15 test section without negatively affecting the test capabilities or flow quality in either the 9x15 or 8x6 test section," said Facility Manager David Stark.

Stark said improvements centered on adding acoustic turning vanes and acoustic baffles in three locations; replacing the test section to reduce noise generated by the original test section flow surfaces; and reshaping and adding acoustic treatment to the diffuser.

The project started in June 2017, with the demolition phase from June through September 2017. Construction began in September 2017 and concluded in November 2018. In April 2019, the final diffuser acoustic boxes were installed. Testing will be performed from September through December 2019 to document the operating conditions.

"These improvements brought the 9x15 back to world-class level," Stark said. "Reducing the background noise in the test section will enable us to continue to support testing of models for engine technology development for decades."

By Doreen B. Zudell

Safety Month Series on Instagram: Protecting Our People

When furnace temperatures reach almost 2,200 degrees Fahrenheit, materials engineer Glen Bigelow, pictured, protects himself from the heat. His job requires special safety equipment, such as an aluminized jacket, gloves and hood, which are able to reflect up to 95% of the radiant heat.

During National Safety Month, Glenn is highlighting a series of portraits featuring some of our researchers who dress in protective clothing to do their jobs on the @NASAglenn Instagram account.

GRC-2019-C-01294 Photo by Bridget Caswell

Bigelow

Pioneering SCaN Testbed Decommissioned

The decommissioning of NASA's Space Communications and Navigation (SCaN) Testbed comes after 7 successful years and over 4,000 hours of pioneering accomplishments in the field of space communications. The SCaN Testbed completed its final experiment operation on April 18 and incinerated during its return to Earth earlier this month.

Launched the summer of 2012, the Glenn-designed and constructed SCaN Testbed was installed aboard the International Space Station to serve as an on-orbit, software-defined radio (SDR) facility. At the core of the testbed are three reconfigurable communication radios.

"SCaN Testbed demonstrated routinely the reconfiguration of radios in space—over 850 times—challenging the perception that even a single reconfiguration poses significant mission risk," said Richard Reinhart, SCaN Testbed principal investigator. "The ability to modify or reconfigure radio operation reduces mission risks by allowing the communication system to work around unexpected hardware or system failures and provides multiple communications capabilities from the same hardware."

The SCaN Testbed has increased the trust that missions place in SDR technology, in addition to showcasing multiple mission uses for the benefits of radio reconfiguration in space. Through the experiments program, almost 20 missions benefited from technology advancements and lessons learned from operations, as well as the additional benefits to others from the numerous publications produced.

Over the years, Glenn partnered with nearly 40 organizations, including other NASA centers, universities, Small Business Innovation Research companies and several foreign space agencies, to use the SCaN Testbed to achieve many firsts in radio communication, networking and navigation capabilities. SCaN Testbed was the first full duplex NASA Ka-band mission to use NASA's Space Network and the first to receive the Global Positioning System (GPS) Civil Navigation Message (CNAV) messages in space. Earlier this year, it was the first in-space user of the European Galileo E5a navigation signal, demonstrating the benefits of merging Galileo and GPS to precisely determine orbits of spacecraft.

GRC-2012-C-00681 Photo by Bridget Caswell

Glenn staff preparing the testbed to ship to the Tanegashima Space Center in 2012.

The SCaN Testbed's Ka-band radio, developed by the Harris Corporation, evolved into a successful commercial product line for global aircraft tracking on the Iridium satellite network. The radio was named a R&D 100 award-winning technology and also inducted into the Space Technology Hall of Fame.

Dave Chelmins is project manager for Glenn's Cognitive Communications Project (CCP) that is building upon the successes of the SCaN Testbed. The CCP goal is to increase the data return and resiliency of missions by merging SDR technology with machine learning, networking and automation.

"We've demonstrated the ability to reconfigure communication systems on the fly," said Chelmins. "The next step is to make that reconfiguration autonomous and responsive to the needs of the mission spacecraft."

Last year, the SCaN Testbed demonstrated the first-ever adaptive space link controlled entirely by an artificial intelligence algorithm. Now, the CCP team is working towards a follow-on cube-satellite flight mission.

By S. Jenise Veris

GRC-2012-CN-00034 Photo by NASA JSC

SCaN Testbed mounted aboard the International Space Station.

Larry Sivic Named Associate Director

Sivic

Center Director Dr. Janet Kavandi has appointed Lawrence (Larry) A. Sivic as the center's new Associate Director. He replaces Janet Watkins, who was selected to serve as the Mission Support Program Manager for the Office of Chief Information Officer at Headquarters.

In this new position, Sivic is responsible for the management of institutional operations at Glenn, while managing the coordination, integration and evaluation of activities across directorates and organizations.

"Larry has been an asset to NASA Glenn, overseeing one of the largest increases in workload and budget in our center's history," said Kavandi. "His leadership experience, coupled with his extensive knowledge of the center's mission and organizational structure, will create opportunities to implement change and improve operations, ensuring Glenn remains a significant contributor to the agency's future exploration and aeronautics missions."

Prior to his appointment to this position, he served as NASA Glenn's Chief Financial Officer (CFO), responsible for leading and managing the development, implementation and administration of all center budgeting ($850 million for fiscal year 2019), accounting, business systems, financial audits/internal controls and cost-estimating activities.

WKYC-TV 3's Kling Talks Leadership With Center Director Kavandi

Glenn staff learned more about how Dr. Janet Kavandi's career path led her to NASA Glenn during "Conversations on Leadership: From Earth to Space and Back," on April 30 at Lewis Field. The program featured a casual conversation between Center Director Kavandi and WKYC-TV 3 Chief Meteorologist Betsy Kling.

GRC-2019-C-01691 Photo by Marvin Smith

Kling, left, led a conversation with Dr. Kavandi that offered her insight into her career, family and leadership style.

Deputy Director Dr. Marla Pérez-Davis provided welcoming remarks and reflected on why Kavandi's leadership makes her ideal to meet the challenges of NASA's new mission and chapter in history.

During the program, an enthusiastic Kling invited Kavandi to share insights on her career as an astronaut, post-flight assimilation into other roles within the agency and goals as Glenn's director. Kling and Kavandi also talked about her recent achievement of being inducted into the U.S. Astronaut Hall of Fame. The conversation was infused with humor, antidotes and personal reflections.

Kavandi recognized members of the 2017 Astronaut Candidates class, who took time from their visit to the center to attend the program. She shared a few aspects of living and working in space, stressing the importance of teamwork and commitment to one another's safety.

When asked about her legacy at Glenn, Kavandi said, "I want to inspire the staff to work together as a team in achieving great things that will bring them pride, and earn a positive place in the history books.

Glenn Welcomes Astronaut Candidates

GRC-2019-C-01958

Candidates pose with some of Glenn's senior managers.

Photo by Jordan Salkin

NASA's 2017 Astronaut Candidates learned about Glenn's technologies and got to know some of our employees during their first visit to the center, April 29 and 30. Their itinerary included tours of several facilities and opportunities to interact with staff at Lewis Field and Plum Brook Station. They also attended Center Director Janet Kavandi's "Conversations on Leadership: From Earth to Space and Back," where she shared highlights on her career and insight on being an astronaut.

NEWS AND EVENTS

GRC-2019-CN-00032 Photo by Doreen B. Zudell

Glenn, Students Focus on Environmental Stewardship

Glenn Environmental Scientist Stacey Yanetta, center, works with students from Fairview High School's Environmental Science class to place a cage around a tree to protect it from deer. On May 9, students planted native trees, shrubs and grasses along the stream bank of Guerin Ditch to help with erosion control, temperature regulation and wildlife habitats. Last year, students took samples to determine the makeup and quality of the water and develop a restoration plan. This is a continuation of that work under a grant project with the Rocky River Watershed Council and Glenn's Environmental Management Office.

NASA Brings Moon and More to Visitors at Science Festival

GRC-2019-C-02109 Photos by Bridget Caswell

Andrew Smith (foreground) and Jeff Chin discuss X–57 electric aircraft.

GRC-2019-C-02141

Aimee Crane shares information on Orion's parachute system.

NASA Glenn led the planning effort to host a range of agencywide exhibits and demonstrations at the inaugural COSI Science Festival in Columbus, May 1 to 4. Festival attendees explored earth science, flight and space through NASA's hands-on exhibits and activities. This included a virtual reality tour of satellites in orbit, electric aircraft, the James Webb space telescope and seeing sound using light waves. Several of the exhibits centered on Artemis, NASA's program to send astronauts to the Moon in the next 5 years with a landing on the lunar south pole.

GRC-2019-C-02112

Carlos Gomez shares information about NASA Glenn's Visitor Center during the festival.

Trailblazing Female Aviator Visits

Pilot and aviation trailblazer Mary Wallace "Wally" Funk, visited Lewis Field on March 29. After meeting with Deputy Director Dr. Marla Pérez-Davis, Funk toured wind tunnels and research laboratories, learning more about Glenn's aeronautics and space research. During her stop in the Flight Research Building (Hangar), Funk, left, talked with Research Pilot Jim Demers. She was one of the Mercury 13—a group of women who trained to become astronauts in the early 1960s.

GRC-2019-C-00770 Photo by Marvin Smith

Deputy AA of Aeronautics Visits, Awards Achievements

GRC-2019-C-01616 Photos by Rami Daud

Glenn's Dr. Othmane Benefan, right, briefs Pearce and others on tour about the SMART–VG (Vortex Generator).

With an estimated 41,000 new aircraft needed in the next 15 years, and the total market value of those planes reaching $6.1 trillion, it is crucial that NASA maintains its technological preeminence in aeronautics.

Deputy Associate Administrator of the Aeronautics Research Mission Directorate (ARMD) Robert Pearce shared this message during his visit to Lewis Field and Plum Brook Station, April 23 and 24. He met with senior leadership and toured facilities to learn more about how Glenn is working to meet the technological challenges of the commercial aviation sector.

At his town hall meeting at Lewis Field, Pearce discussed NASA's Aeronautics' budget, priorities, partnerships and challenges. He acknowledged the great work Glenn has accomplished over the decades and the many opportunities that lay ahead for the center. "I'm pleased with the performance of our aeronautics centers, projects and facilities," he said. "A lot of important work is coming up at Glenn."

Glenn Aeronautics Director Dr. Rubén Del Rosario announced the winners of the 2018 ARMD awards during the town hall. He stressed the significance of the awards, which recognize civil servants, support service contractors and students/interns who demonstrate a profound positive impact and benefit to ARMD, its partners and/or stakeholders. Center Director Dr. Janet Kavandi assisted Pearce in presenting the awards.

GRC-2019-C-01588

Dr. Rodger Dyson, middle, receives the individual award under Technology and Innovation.

Technology and Innovation—Individual Award
Dr. Rodger W. Dyson

Dyson has demonstrated sustained engineering excellence as the technical lead for the development of the NASA Electric Aircraft Testbed (NEAT) facility located at Plum Brook Station. His leadership has provided a broad perspective in the field of electrified aircraft propulsion, in part by identifying technology gaps that influenced innovations in the testing of components and systems at the NEAT facility.

GRC-2019-C-01593

Michael Rodgers, middle, receives an honorable mention in the category of Leadership and Management Excellence.

Program and Mission Support—Group Award
Low Boom Flight Demonstrator (LBFD) Project Planning and Control (PP&C) Team
Langley, Glenn, Armstrong and Ames
Glenn's Mary Neuzil is a team member.

The LBFD PP&C Team provides all the business and management systems to ensure successful LBFD project execution within specified budgets and schedules. They have set a new standard for PP&C excellence in establishing and baselining new processes and operating procedures for future NASA X-plane projects, which they are sharing across NASA Aeronautics.

GRC-2019-C-01591

Thomas Miller, middle, accepts the group award for the Smartest Failure for the X–57 Battery and Redesign Team on behalf of the team.

Smartest Failure—Group Award
X–57 Battery Test and Redesign Team
Glenn, Armstrong and Johnson
Glenn's Dr. Dionne Hernandez-Lugo is the team lead.
Following a major failure, the Glenn-led X–57 Battery Test and Redesign Team worked diligently to understand the physics of the failure, and further worked to methodically redesign the system to prevent a recurrence.

GRC-2019-C-01592

Two Glenn members of the High Ice Water Content Flight Evaluation Team, Acosta, second from left, and Ratvasky, third from left, were present for an honorable mention in the Technology and Innovation category.

Honorable Mentions
Technology and Innovation Team
The High Ice Water Content Flight Evaluation Team based at Langley. Glenn team members include **Waldo Acosta, Kurt Blankenship, Thomas Ratvasky, Anthony Nerone and Walter Strapp.**

Leadership and Management Excellence
Michael Rogers
This category recognizes exemplary performance by an individual in leading and managing people in the formulation and accomplishment of disciplined research in the field of aeronautics, demonstrating leadership qualities that invite collaboration and foster dedication to team excellence.

AWARD

GRC-2019-CN-00033
Photo by Robert Markowitz

Glenn's **MacAllister "Callie" West** received a Rising Star of the Year Award at the recent 2019 Office of General Counsel Conference at NASA Johnson. This award acknowledges excellence in the next generation of NASA attorneys and leaders. A seasoned litigator, West has a proven track record of embracing challenges and raising the bar. Pictured: NASA's Chief Counsel Sumara Thompson-King, left, with West at the event.

Hamilton

PROMOTION

David F. Hamilton was selected chief of the Technical Services Branch in the Fabrication Division. Hamilton most recently served as facility electrical engineer in the 8 by 6-Foot Supersonic Wind Tunnel and the 9 by 15-Foot Low-Speed Wind Tunnel (9x15 LSWT). He provided leadership with the large-scale upgrades to the 9x15 LSWT.

Interns and Faculty Come Aboard!

NASA Glenn welcomes its 2019 summer interns and faculty this month!

The first group of Lewis' Educational and Research Collaborative Internship Project (LERCIP) interns came aboard on June 3. The second group joined the NASA team on June 10.

The NASA Glenn Faculty Fellowship Program; NASA (Graduate) Fellowship Program; NASA Internship Project; New York Space Grant Consortium; Puerto Rico Space Grant Consortium; and Experimental Program to Stimulate Competitive Research (EPSCoR) all welcomed summer staff on June 3.

RETIREMENTS

Jackie Barbetta, Financial Services Branch, Accounting and Financial Analysis Division, retired April 30, 2019, with 30 years of service.

Alan Downey, System Architectures and Analytical Studies Branch, Communications and Intelligent Systems Division, retired April 30, 2019, with 42 years of service.

Lisa Ferenc, Financial Services Branch, Accounting and Financial Analysis Division, retired April 30, 2019, with 38 years of federal service, including 35 with NASA.

Gary E. Gorecki, Aerospace Test Branch, Testing Division, retired Jan. 3, 2019, with 40 years of service

George P. Jacynycz, Space Environments Test Branch, Testing Division, retired Dec. 22, 2018, with 40 years of service.

Dr. Mary Ann Meador, Materials Chemistry and Physics Branch, Materials and Structures Division, retired April 30, 2019, with 35 years of service.

Dr. Michael A. Meador, Materials and Structures Division, Research and Engineering Directorate, retired April 30, 2019, with 35 ½ years of service.

Barbetta

Downey

Ferenc

Dr. Meador

Dr. Meador

MORE THAN A MEMORY

McLachlan

Andrew B. McLachlan, 83, a 1992 retiree with 30 years of service, died March 22. He was a U.S. Air Force veteran, who joined the NASA workforce in 1962 as an electronic specialist in the Test Installation Division. During his tenure, he earned a Suggestion "Incentive" Award for a switch to alert a Vidar data machine's readiness to take data results. He also earned several Special Act and Service awards for his efforts related to center support of space shuttle missions.

Dr. Rosenblum

Dr. Louis "Lou" Rosenblum, 95, who retired with nearly 30 years of service, died April 4. Rosenblum was a U.S. Army veteran of World War II, who joined NASA in 1954. He became a research scientist and solar/electric energy innovator of photovoltaic techniques and solar panels installed in remote sites around the world. He co-invented a portable electron-beam welder and helped develop an early nickel-zinc battery that could power a car. Rosenblum retired as chief of the Solar and Electrochemical Division.

Saltsman

James F. Saltsman, 92, a 1994 retiree with 33 years of NASA service, died April 18. Saltsman was a U.S. Army Veteran of the Korean War. He began his NASA career as a materials research engineer in the Nuclear Systems Branch at Plum Brook Station. He co-authored a significant report on the Design of Gas-Cooled Test Loop for NASA's Plum Brook Reactor Facility. Saltsman later worked on the thermodynamic properties of metallic alloys in jet and rocket engines at Lewis Field.

AWARDS

Gibson

Dr. Louis Ghosn

The Rotary National Award for Space Achievement (RNASA) Foundation selected NASA Glenn's **Marc Gibson** and **Dr. Louis Ghosn** among this year's Stellar Award winners. They were recognized at the RNASA annual gala on April 26 in Houston.

Stellar Awards are presented, annually, to individuals and teams in four categories—Early Career, Mid-Career, Late Career and Team—to recognize the "behind-the-scene heroes" of the American space program. The winners are selected based on which accomplishments hold the greatest promise for furthering future activities in space.

Gibson won in the Mid-Career Stage category for outstanding leadership of the groundbreaking Kilopower Reactor Using Stirling Technology (KRUSTY) experiment, which paves a path for NASA Space fission power systems. Ghosn earned a Late Career Stage award for exceptional knowledge and expertise in the fields of structural and fracture mechanics, contributing to the success of numerous NASA missions.

Three additional Glenn employees/teams were among the nominees for this year's Stellar Awards. They include **Susan Motil,** European Service Module Integration manager; the Kilopower Fission Surface Reactor Team and the Space Communications and Navigation (SCaN) Testbed Team.

Upcoming Center Events

Save the Date

50 Celebrating US YEARS OF APOLLO

2019 Center Picnic

Wednesday, Aug. 7

(Rain date: Thursday, Aug. 8)
11 a.m. to 2 p.m.
Lewis Field Picnic Grounds

Come enjoy lively music, picnic fare and fun activities with your co-workers.

Registration begins in a few weeks.

Watch Today@Glenn for details.

Retirees are cordially invited to attend, so spread the word!

To register, contact Jill Noble, at 216–433–3711.

GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 77 from June 18 to 27, and building 86 from July 9 to 18 from 1 to 3 p.m. 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 a mass notification "voice" test at building 3 at Lewis Field on Wednesday, July 3. An audible siren test will be conducted on the "Area Evacuation" tone on Saturday, July 6.

POC: Allen Turner, 3–6826

JOHN GLENN MEMORIAL SYMPOSIUM

The American Astronautical Society will bring together leaders in government, industry and academia for a 2-day event to discuss advancements in aerospace technology, including power and propulsion, communications, hypersonics and more. The event is July 10 to 12 in downtown Cleveland.

Visit **https://astronautical.org/events/john-glenn-memorial-symposium/** for details.

POC: Lori Manthey, 3–9658

IFPTE LOCAL 28, LESA MEETING

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

Deadline for next calendar section is **June 19, 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

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www.nasa.gov

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

Glenn Innovation Inducted Into Space Technology Hall of Fame

Glenn's **Thomas Kacpura, Richard C. Reinhart, Joseph Downey** and **Sandra Johnson,** along with Harris Corporation staff, were inducted into the Space Technology Hall of Fame, April 9, for developing and adapting the Ka-Band Software-Defined Radio (SDR). The technology allows for faster transmission of NASA's scientific data back to Earth, and affords development of cutting-edge satellite systems for worldwide satellite-based aircraft and ship tracking capabilities.

The Space Technology Hall of Fame honors scientists, engineers and innovators for effectively adapting space technologies to improve the quality of life for all humanity. It also highlights the benefits of these technologies as a return on investment in space exploration.

GRC-2013-C-02920 Photo by Marvin Smith

Left to right: Glenn's Kacpura, Johnson, Downey and Reinhart.

GRC-2019-CN-00008 Photo by NASA

The NASA/Harris Ka-Band SDR.

While NASA's space missions and priorities can change, the hardware typically cannot. The Ka-band SDR can be adapted to new missions by adjusting its software. This reprogrammable radio is the first technology of its kind to use reconfigurable software that operates within the Ka-band frequency.

Following testing aboard the International Space Station as part of NASA's Space Communications and Navigation (SCAN) testbed in 2012, the Harris Corporation further developed the reconfigurable technology for commercial use. Today, more than 250 orbiting software-defined payloads use this technology.

Emergency and Inclement Weather Lines

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

Connect With Glenn