National Aeronautics and Space Administration



AeroSpace FRONTIERS

VOLUME 21 • ISSUE 7 • AUGUST 2019

Safety In Your Hands Pages 6–7

Counseling Services for Work and Home Page 9

Construction Project Necessitates Detour Page 9 Former NASA Leaders Inspire Interns

Pages 2–3



Cryogenic Testing Starts With Process Safety Management

As we gear up for a series of tests of an Evolvable Cryogenic project's tank (Structural Heat Intercept Insulation Vibration Evaluation Rig) at the Plum Brook Station In-Space Propulsion complex, our team is addressing all safety measures for the handling and operation of cryogenic propellant to accurately characterize the hardware. A new Glenn Safety Manual chapter has been developed responding to an Occupational Safety and Health Administration standard to assure process controls are understood, communicated and analyzed prior to testing. The Glenn team is stepping up once again to ensure success by way of engagement, training and engineering controls.

Thank you for your diligence!



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.

Editor: **Doreen B. Zudell**, ATS, 216–433–5317

Assistant Editor: S. Jenise Veris, ATS

Design: Jami Drost, ATS

Managing Editor: Kelly R. DiFrancesco

Circulation: **Angela Williams**, ATS, 216–433–8921

Gregory Engages Interns on Leadership Lessons

Fred Gregory, former NASA deputy administrator and astronaut, visited NASA Glenn to share his myriad of experiences and words of wisdom with summer interns on June 20.



Interns line up to ask questions during Q&A. (Photos by Rami Daud; GRC-2019-C-03887)



Gregory gestures about a decision-making experience. (GRC-2019-C-03879)



One of the lighter moments during the Q&A. (GRC-2019-C-03896)



On the Cover: Former NASA Deputy Administrator and astronaut Fred Gregory, left, and former Glenn Center Director Dr. Julian Earls, engage summer interns during a lively presentation on leadership. (GRC-2019-C-03892)

More than 150 Glenn summer interns, and other NASA interns participating remotely, were treated to Fred Gregory's compelling presentation, "Lessons on Leadership for a Future Generation."

Gregory captivated the audience with a combination of his storytelling and an audiovisual presentation that demonstrated the value of life experiences where he moved beyond his comfort zone and up the ladder of leadership to greater career opportunities.

"Mr. Gregory was very open and honest about his life journey," said Joselyn Hathaway, Office of Communications and External Relations intern. "I learned from him that no matter where you come from, the future awaits, and you never know what life-changing event is in store for you."

Former Glenn Center Director Dr. Julian Earls introduced Gregory, at his request, and moderated the question and answer session that followed. Earls added levity and inspiration from his shared experiences with Gregory, who remains a close friend and colleague.

By S. Jenise Veris



Photo by Marvin Smith GRC-2019-C-04100

Workshop Focuses on Cognitive Communications for Aerospace Applications

NASA Glenn and the Institute of Electrical and Electronic Engineers sponsored the second Cognitive Communications workshop held at the Ohio Aerospace Institute, June 25 and 26. The workshop provided an international forum for 100 scientists and engineers from across NASA, academia, industry and other government agencies to learn from 31 speakers on advances in machine learning techniques and cognitive technologies, and their applications to address NASA technical challenges. Badri Younes, deputy associate administrator for Space Communications and Navigation (SCaN), pictured, was among three keynote speakers. This event helped solidify Glenn's position as cognitive experts within NASA and SCaN.

NEWS AND EVENTS

Injustices Spur LGBTQ Civil Rights Movement



In observance of Pride Month, the Office of Diversity and Equal Opportunity hosted a lunch and learn featuring a viewing and discussion of the film "The Lavender Scare." This is the first documentary to tell the little-known story of a 40-year campaign by the federal government to identify and force employees suspected of being homosexual to resign. The film highlighted personal stories of a few of the thousands of federal workers who lost their jobs because of their sexual orientation, including Frank Kameny, who helped spark the LGBTQ rights movement in America.



Former NASA Administrator Bolden shares advice with Glenn interns at the reception. (Photo by Marvin Smith; GRC-2019-C-05309)

Glenn Symposium Powers Innovative Conversations

The inaugural John Glenn Memorial Symposium was held July 10 to 12 at the Global Center for Health Innovation in Cleveland. It was a hub of activity for the latest information on advancements in aerospace and aeronautic technology including power and propulsion, communications, hypersonics and more.

Hosted by the American Astronautical Society, in conjunction with NASA Glenn, the symposium drew capacity crowds who came to gain perspective on the theme "Powering Innovation From the Sky to the Stars." The event showcased a paradigm shift in commercial aviation, while accelerating efforts to land the first woman and next man on the Moon by 2024, and from there, travel to Mars.

Center Director Dr. Janet Kavandi chaired the planning committee that helped assemble Glenn technical experts who served as speakers and panelists. The experts included Michael Barrett, manager of Glenn's Propulsion Element Project; Dawn Emerson, chief of Communications and Intelligent Systems; John Hamley, manager of Radioisotope Power Systems Program; Joel Kearns, director of Facilities, Test and Manufacturing; Trudy Kortes, chief of Human Exploration and Space Operations; and Doug Wheelock, astronaut and deputy director of Aeronautics Strategy.

Together with representatives from internal and external NASA leadership and our partners in the aerospace industry and academia, the speakers provided a broad perspective to panel topics. Discussion centered on the science and technology advancements, but also delved into policy, workforce development, human factors and other topics relevant to both space flight and aviation.

Some of the most popular presentations included "The Legacy of John Glenn" by David Glenn, son of the late senator and former astronaut John Glenn; "Humans Returning to the Moon–More Than Flags and Footprints" with Kavandi and an all-astronaut panel; and the remarks of former NASA administrator and astronaut Charlie Bolden.

Symposium participants also had the opportunity to tour NASA's world-class test facilities at Plum Brook Station, which houses the world's largest and most powerful space environment simulation facilities.

By S. Jenise Veris



The astronaut panelists, left to right, Wheelock, Dr. Sandy Magnus, Steve Lindsey, Robert Curbeam and Dr. Kavandi.



Safety and Health Awareness: Lives Depend On It

Glenn's Safety and Health Awareness Event, June 25 to 27, focused on the theme "Safety Is In Your Hands." It stressed that the decisions we make as individuals can affect the lives of many people.

Paul Sean Hill, author and speaker with Atlas Executive Consulting LLC, and Susan Sawatzky, renowned fatigue management specialist, served as keynote speakers for the event. They expounded on the theme during presentations at Lewis Field, June 25, and Plum Brook Station, June 26.

Hill discussed how a previously successful culture can lead to avoidable failure. As a former Mission Operations Director at NASA's Johnson Space Center, he provided first-hand insight into managing risks and succeeding in difficult situations.

"A culture can make you or break you," he stressed. "What is the culture in the room? Does it welcome questions and dissenting opinions?"

As Director of In-Scope Solutions, Sawatzky works with companies to increase safety by better managing the risk of fatigue in the workplace. Her Safety Culture Model presentation, laced with facts and humor, brought awareness to this under-recognized safety and health threat, and showed us ways to avoid it.

"Sleep-deprived employees are 2.9 times more likely to be involved in an accident," she said. "Sleep is a basic human need that must be met."

On June 25, NASA safety experts led a facilitated Mishap Panel Discussion at Lewis Field. Topics included a Mishap Lessons Learned Overview, the Goddard Space Flight Center Arc Flash Mishap, the Vacuum Facility 5 Fire, and the Government-Industry Data Exchange Program.

Information booths, set up at Lewis Field and Plum Brook Station, offered materials and discussions. While visiting

them, employees learned about the many ways they can improve their safety and health, and were reminded how to identify hazards.

Dr. Roy Buchinsky from University Hospitals was the featured speaker for Health Day at Lewis Field, June 27. He gave an enlightening presentation on the topic of integrated health, discussing conventional medicine, complementary and alternative medicine and lifestyle/self-care.

Both Glenn campuses hosted Center Health Walks where employees stepped out into the sunshine to compete for the annual Golden Shoe Awards.

By Doreen B. Zudell



Morgan Miller, left, uses a sound level meter to demonstrate the exposure to hazardous noise levels from listening to loud music through earbuds. (Photo by Rami Daud; GRC-2019-C-04371)



GRC-2019-C-04352

Photo by Rami Daud





GRC-2019-C-04313

Photo by Marvin Smith



Lewis Field and Plum Brook Station, pictured, hosted Center Health Walks where employees stepped out to compete for the annual Golden Shoe Awards.

Top left: Former NASA Mission Operations Director, Hill, provided first-hand insight into managing risks and succeeding in difficult situations.

Top center: Fatigue expert, Sawatzky, brought awareness to this underrecognized safety and health threat.

Top right: Dr. Buchinsky gave an enlightening presentation on the topic of integrated health.

Our Test Cells Venus Radio Frequency Propagation Study

Glenn researchers are calculating the effects a Venusian atmosphere would have on radio frequency signals, which are integral to electronic communications systems. Venus's atmosphere—which is extremely hot and dense and contains corrosive chemicals like supercritical carbon dioxide and sulfuric acid—makes the development and testing of such systems difficult.

Using the Glenn Extreme Environments Rig (GEER) facility, the Venus Radio Frequency Propagation Study observed how radio waves travel from one point to another in a Venusian atmosphere. The test calculated the resistance they encountered.



Test hardware inside the GEER facility.

To do this, researchers used a device equipped with parallel stainless steel mirrors—called a Fabry-Perot resonator—to see how the radio waves would act. The mirrors reflected radio frequency signals and researchers observed how they resonated in a simulation of Venus's harsh atmospheric conditions.

Knowledge from this test will aid in the design and operation of communication systems for future research on Venus. The objective is to ensure that any data from tests conducted on Venus can be effectively retrieved and relayed to scientists.

Researchers Jennifer Jordan and George Ponchak, Advanced High Frequency Branch, conducted the test. The project was funded by the NASA Science Innovation Fund.

By Claire Moore

Promotions

A Look Inside



Dr. Celestina

Dr. Mark Celestina has been selected chief of the Turbomachinery and Turboelectric Systems Branch in the Propulsion Division, Research and Engineering Directorate. Celestina previously served as technical lead for Unconventional Propulsion Airframe Integration under the Aeronautics Research Mission Directorate's Advanced Air Transport Technology project.



Pham

Kimlan "Kim" Pham has been selected Compact Gas Turbine subproject manager for the Advanced Air Transport Technology (AATT) Project in the Aeronautics Mission Office. Pham previously served with the AATT Project developing new technologies to improve fuel efficiency and environmental performance for subsonic transport aircraft.

EAP Offers Counseling Services On-Site and Close to Home



Wilcox

During times of personal and professional turmoil, it is important to have access to resources that can provide support and sound guidance. The Employee Assistance Program (EAP) offers free and confidential assessments, short-term counseling, referrals and follow-up services for Glenn civil servant employees and their household members.

"Our personal lives are so intertwined in our work lives that if something isn't going right at home, it

can affect our job performance, and vice versa," said Susan Wilcox, clinical social worker with EAP.

Wilcox began serving as NASA Glenn's on-site EAP consultant in September 2018. She brings more than 30 years of counseling experience in a variety of government, military and corporate settings. Her office is located in the Employee Center, Room 105A, at Lewis Field. She is on-site Mondays and Wednesdays from 8 a.m. to 3 p.m. and Fridays from 8 a.m. to 2 p.m., and can be reached at 3–2989.

The EAP also provides a toll-free number, 800–222–0364, where you will receive an immediate response from a caring professional—24 hours a day, 7 days a week. Civil servant employees can arrange to meet or speak with a licensed EAP counselor who is available in your community to provide consultation, short-term problem solving or crisis management. No matter what the issue relates to—work, relationships, family, health, finances or substance use—the EAP is here to help.

EAP Services

- On-site consultations for civil servants with Wilcox (3-2989)
- Toll-free number: 800-222-0364 (24 hours a day, 7 days a week)
- · Management coaching for supervisors to support their employees
- · Health and wellness presentations for groups/offices
- WorkLife4You experts to provide resources from child and elder care to relocation
- Financial and legal services
- Critical incident response

To access resources that will help you better manage your work and life responsibilities, visit the EAP website at **www.FOH4You.com**.

Editor's note: Many companies offer their employees EAP or similar counseling services. On-site contractors are encouraged to contact their employers for details on these services.



This road serves as a detour route between the Central Campus and the West Area.

Construction Project Necessitates West Area Road Closure

Proceed with caution through detour

Phase 2 of a multiphase plan to repair the storm sewer drainage system at Lewis Field is underway. The project centers on modifications and improvements to several outfalls (pipes) used to carry storm water to the Rocky River watershed. Improvements will also be made to West Area Road.

"Improvements to the storm water infrastructure will increase the design life of the system by 25 years," said Patrick Edmonds, Project Management Branch. "It will also improve storm water quality at the outfalls, reduce outlet flow and velocity discharge and maximize the potential to reduce storm water fees."

The West Area Hill will remain closed through early December for the storm sewer repairs and roadway improvements. A road connecting Cedar Point Road and West Area Road was completed to serve as a detour route between the Central Campus and the West Area. Pedestrian traffic is prohibited on Cedar Point Road.

The lab bus service will continue to support the West Area during this closure, Monday through Thursday 7:30 a.m. to 5:30 p.m. and Friday 7:30 a.m. to 4:30 p.m.

"The summer construction season is in full swing at the center," Edmonds said. "Please be extra careful maneuvering around the traffic cones and orange barrels." Visit the "Traffic Impacts" link on WING to find the latest updates on road closures.

By Doreen B. Zudell



An existing storm water sewer.

RETIREMENTS



Beznoska







Pietravoia

Bernice Beznoska, Innovation and Integration Office, Office of Technology Incubation and Innovation, retired June 30, 2019, with 32 1/2 vears of federal service, including 31 with NASA.

Sandy Hardy, NASA Safety Center, retired June 7, 2019, with 34 years of federal service, including 29 with NASA.

Thomas W. Kerslake, Power Architecture and Analysis Branch, Power Division, retired June 30, 2019, with 34 years of service.

Lori O. Pietravoia, director, Office of Glenn Human Resources, retired June 3, 2019, with 39 years of federal service, including 29 with NASA.

MORE THAN A MEMORY



Moore



Richards

Tripp

Thomas J. Moore, 88, a 1994 retiree with 31 years of service, died May 15. Moore was a renown materials engineer and authority on welding processes, applications and design. He held four patents on welding research and authored numerous papers, which have become standards for welding techniques and led to improvements in manufacturing. Throughout his career in the Materials and Structures Division, Moore mentored and provided advanced training in welding processes to center engineers.

Gloria Richards, 72, a 2013 retiree with 38 years of service, died May 17. Richards retired as the Administrative Officer in the Business Support Office of the Research and Technology Directorate following a career of sustained outstanding achievement and excellence. She earned numerous clerical and administrative awards in addition to a NASA Exceptional Service medal and Cleveland Federal Executive Board Wings of Excellence award for leading high-performance teams and major center efforts. She was a founding/active member of Glenn's Veteran Awareness Committee.

Paivi H. Tripp, 70, a 2009 retiree with nearly 29 years of service, died May 1. Tripp began her NASA career in 1980 in the Resources Management Office after completing the Presidential Management Internship program. She advanced to chief of the Space Station Freedom Branch, then Deputy Procurement Officer, and later as Chief Officer of Procurement. Tripp earned a NASA Exceptional Service medal and Federal Executive Board Wings of Excellence for leadership and successfully implementing innovative business solutions.



Begany

Begany Built Enduring Structures and Relationships

Joseph E. Begany, 63, a NASA Glenn architect for nearly 33 years, most recently serving in the Project Management Branch of the Facilities Infrastructure Division, died in an airplane crash on June 30.

Since joining NASA as a project architect in 1986, Begany has been a valuable member of the center's team responsible for overseeing day-to-day work in project execution for modification, relocation and construction of Glenn facilities.

Renee Palyo, chief of the Facilities Infrastructure Division, said Begany has left a lasting impression on this center with his architectural contributions to many facilities. Some of these include the Lewis Field Main Gatehouse and Shipping and Receiving Facility, Child Development Center, Fitness Center, Picnic Pavilion, Central Chemical Storage Facility and Small Multi-Purpose Research Facility (SMiRF).

"Joe had a passion for life and was never shy about trying new activities. He enjoyed architecture, but lived for the social moments with friends, family and other likeminded enthusiasts," said Tony Doglio, current supervisor. "He will be missed by many."

Upcoming Center Events

Lagrange Point Café

Building 162 (MIC) first floor kiosk 7:30 a.m. to 2 p.m. weekdays, excluding holidays



A variety of specialty coffees, teas and other drinks, sandwiches and more!

POC: Amanda Thompson, 3-3678

Sustainability Street Fair

Thursday, Sept. 26 10:30 a.m. to 1:30 p.m.

Stay tuned to Today@Glenn for details.



GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 162 from Aug. 13 to 22. 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

RETIRED WOMEN'S LUNCHEON

The next luncheon will be on Thursday, Aug. 15, at 1 p.m. at Michael Angelo's Winery, 5515 Broadview Road, Richfield. To reserve your place, please notify Gerry Ziemba at 330–273–4850 or gto64gerry@yahoo.com.

OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct a mass notification "voice" test at building 15 at Lewis Field on Wednesday, Sept. 4. An audible siren test will be conducted on the "tornado" tone on Saturday, Sept. 7.

POC: Allen Turner, 3-6826

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, Sept. 11, noon, in the Glenn Employee Center's Small Dining Room.

Deadline for next calendar section is **Aug. 21, 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.



NEAT Tests Megawatt-Scale Electric Aircraft Power Systems

At left: An aircraft electrical power system in NEAT's vacuum chamber simulates altitudes of up to 40,000 feet to test high-voltage power electronics, electric motors and controls. (Photo by Bridget Caswell; GRC-2017-C-09976)

As large airline companies compete to reduce emissions, fuel and noise, aircraft manufacturers are shifting more of their aircraft systems to electrical power. To help usher in the next revolution in aviation—hybrid electric and turboelectric aircraft—NASA is building and testing portions of a concept aircraft's power systems with an eye toward the future.

NASA Glenn has repurposed its Hypersonic Tunnel Facility to create the NASA Electric Aircraft Testbed (NEAT). Located at Plum Brook Station, NEAT is a world-class, reconfigurable facility that can accommodate power systems for large passenger airplanes like a Boeing 737, with megawatts of power. This testbed, which recently conducted its first megawatt-scale test, takes advantage of the facility's massive amounts of available power to carry out research and technology development of aircraft electrical powertrains.

"We can lay out an entire electric powertrain, not including the engines, in NEAT and test all of the key electrical systems for an electrified aircraft," said Dr. Rodger Dyson, principal investigator.

NEAT also includes a vacuum chamber, which can currently simulate altitudes of up to 40,000 feet to test high-voltage power electronics, electric motors and controls. Within the year, NASA plans to increase the altitude capability to over 50,000 feet.

"NEAT can make a difference in aviation because it has the power and size to investigate the full power capabilities of the next generation of hybrid and turboelectric aircraft," said Dyson.

By Nancy Smith Kilkenny

Emergency and Inclement Weather Lines Lewis Field: 216–433–9328 (WEAT)

Plum Brook Station: 419–621–3333

