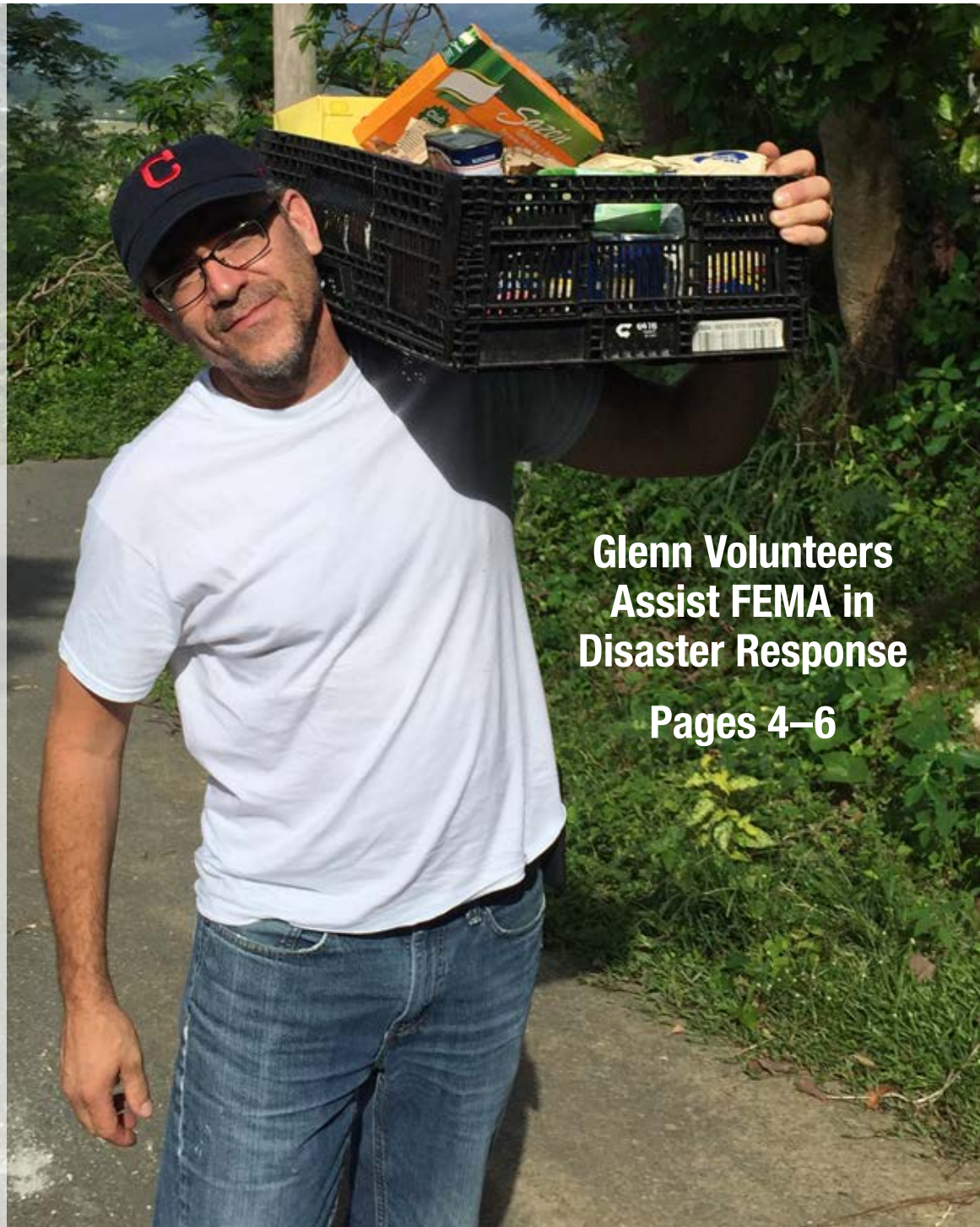
National Aeronautics and Space Administration

AeroSpace FRONTIERS

VOLUME 20 • ISSUE 2 • FEBRUARY 2018



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Safe Operation is our Best Practice

Glenn faces aging infrastructure and requires frequent maintenance. We recently encountered some issues that, when coupled with severe weather conditions, presented unforeseen challenges to our critical test operations. In one case, we discovered cement degradation in the Central Processing System exhaust stack. This caused an interruption to several facilities, including the Aero-Acoustic Propulsion Laboratory and the Propulsion Systems Laboratory. In another case, a water line rupture in Cooling Tower 5 interrupted the 10- by 10-Foot Supersonic Wind Tunnel operations. Fortunately, we have a team of operations and safety professionals who applied sound technical analyses and made appropriate repairs, thereby enabling a safe return of test operations.

Your fellow co-workers and I appreciate your continued commitment to a safe and healthy workplace.

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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GRC-2018-C-00140
Photo by Marvin Smith

Gorecki, center, shows Astrobotic employees Hinckley (left) and Solorzano (right) how to make flight-qualified cables/harnesses.

Glenn Provides Expertise in Lunar Initiative

Through the Lunar Cargo Transportation and Landing by Soft Touchdown (Lunar CATALYST) initiative, NASA competitively selected three partners in 2014 to spur commercial cargo transportation capabilities to the surface of the Moon.

Two representatives from one of those partners, Pittsburgh-based Astrobotic Technology, recently visited NASA Glenn. During the 3-day visit, they met with members of Glenn's Power Division and Testing Division and received instructions on how to build a flight-qualified harness for their lander called Peregrine. They also toured several power technology facilities across Lewis Field.

"Based on attendance at a recent Lunar Science for Landed Missions workshop at NASA Ames, there's huge interest by lunar scientists and human exploration advocates from the commercial sector, academia and NASA in returning to the moon, sooner than later," said Bob Cataldo, Power Division.

Lunar CATALYST companies, selected through a NASA Space Act Agreement (SAA), are sponsored by the Advanced Exploration Systems Division of the Human Exploration and Operations Directorate. In addition to Astrobotic Technology, the other two companies are Masten Space Systems Inc., Mojave, California; and Moon Express, Cape Canaveral, Florida.

Astrobotic's Peregrine lunar lander, at 2.5 m in diameter and 1.9 in height, is stout, stiff and simple for survivability during launch and landing. Payloads can attach to the topside or underside of the deck panel. Peregrine's flexible payload mounting accommodates a variety of payload types for science, exploration, marketing, resources and commemoration.

The entire structure is scalable to accommodate various payload capacities up to 265 kg. The team is working towards a 2019 launch as a secondary payload on a United Launch Alliance, Atlas V launch vehicle.

GRC-2017-CN-00091
Photo by Robert Cataldo

Under the SAAs, NASA contributions to the partnership include the technical expertise of NASA staff on integrated subsystem teams, use of NASA center test facilities or hardware/software for commercial lander development and testing at no cost.

During the visit, Gary Gorecki, Testing Division, a certified space flight cable/harness instructor, built several engineering model harnesses. Astrobotic's power and avionics team leads, Ander Solorzano and Tom Hinckley observed and learned the art of flight cable fabrication.

Larry Oberle and Cataldo assisted Astrobotic with the power generation and distribution system for their lander. Other members on Glenn's CATALYST power team include: H. James Fincannon, Terrian Nowden, Richard Oeftering, Philip Stehno, William Bennett and Matthew Myers. All are members of the Power Division.

"We have an outstanding team of experienced engineers who offer a depth of expertise, along with our world-class testing facilities," said Oberle. "Additionally, Glenn's proximity to Astrobotic makes it ideal for travel and affordability."

GRC-2017-CN-00088
Photo by Astrobotic Technology

Members of Glenn's Astrobotic team, left to right: Myers, Nowden, Cataldo, Solorzano (Astrobotic), Bennett, Oberle and Stehno pose in front of a plywood mock-up of the Peregrine lander.

For more information on Lunar CATALYST, visit **https://www.nasa.gov/lunarcatalyst/**.

By S. Jenise Veris

Glenn Volunteers Assist FEMA in Disaster Response

GRC-2017-CN-00079

Sutliff witnessed devastation from the wildfires in Northern California.

A group of Glenn employees took on a humanitarian mission last year that affected not only the lives of those they helped, but also their own.

The year 2017 was one of the worst for natural disasters. Between hurricanes and wildfires, demands for federal disaster relief climbed to a record level.

To assist survivors, the Federal Emergency Management Agency (FEMA) called upon federal employees to volunteer in an effort to help get people back on their feet. Eighteen NASA Glenn staff answered the call.

Last September, volunteers reported for duty at a FEMA training center in Alabama. After training, FEMA deployed the Glenn volunteers to California, Florida, Mississippi, Puerto Rico, Texas and the Virgin Islands.

Many of the volunteers worked 12-hour days, 7 days a week.

"Very long days and then spreadsheet documentation at night," affirmed Michael Perez. He worked as a fuel specialist in and around Mayaguez, Arecibo and Aguadilla, Puerto Rico, ensuring areas of devastation received the proper type and amount of fuel they desperately needed.

Although they were told about the devastation, volunteers were astounded to see it firsthand. Fallen power lines, collapsed/broken bridges, landslides, homes reduced to rubble and victims digging through wreckage were common landscapes.

"The debris was unfathomable. Large trucks lined the roadways to haul the debris to disposal sites," said Amy Hiltabidel. Deployed to Houston, Texas, for Hurricane Harvey Disaster Recovery, Hiltabidel assisted local governments and nonprofits to receive reimbursement for expenses incurred as a result of the disaster.

Robert Kohler was selected to assist recovery efforts at St. John, Virgin Islands. While one of the smallest, most remote of the islands, it was the hardest hit by hurricanes Irma and Maria. "We were warned about the austere conditions—high heat, humidity, no electricity or food," said Kohler.

Dan Sutliff joined a corps of volunteers in Northern California's wine country where he was assigned to a neighborhood in Santa Rosa, a city destroyed by the fires. "It was a humbling experience to witness so much devastation and people sifting through the rubble of their homes," Sutliff said. "My task was to understand their immediate needs and direct them to places where they could get food, water or other resources provided by a coordinated team of multiple agencies."

Assigned to Puerto Rico, Linda Bartos worked as a logistics specialist. She loaded/unloaded trucks and set up Disaster Relief Center build kits (furniture/equipment) at designated locations

Five Glenn employees are among these volunteers at the Anniston, Alabama, FEMA Training Center. Chip Redding (3rd from left), David Fuller (5th from left), Jason Ondercik (6th from left), Linda Bartos (7th from left) and Michael Perez (10th from left).

where survivors could apply for FEMA aid. She also disseminated meals ready to eat (MRE).

"When out in the field, we helped as many survivors and stray animals as we could by supplying them with bottled water, MREs and snacks that we had with us," said Bartos.

Also in Puerto Rico, Billy Hau was assigned to the Water Task Force, a group focused on restoring water supplies to devastated communities. Hau collected data from the field and mapped the regions most in need.

"The people in the remote mountain communities were hit the hardest," said Hau. "They normally use well and spring water, but those resources were destroyed or contaminated after the hurricanes. They now depend on bottled or filtered water."

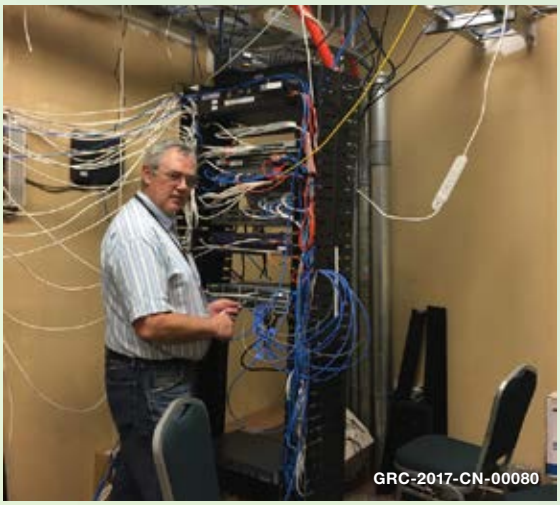
Bethany Eppig assessed the damage to environmental and historic buildings in Florida. Posted to the Orlando area after the hurricane, Eppig helped city and county officials understand how to file permits and follow federal regulations to acquire the resources to repair beach and protected environmental areas.

"Many of the small towns in Florida needed help to understand and meet the federal regulations necessary to secure funds to restore their communities and natural resources," said Eppig. "I was there as a consultant to help them find a path to restoration."

Chip Redding was deployed to Puerto Rico as an information technology (IT) specialist from September to the end of November. He said time away from family and friends was tough, but the daily work routine did not allow much time to reflect on it.

"We were on a mission," he said. "This is something everyone at NASA can relate to."

Story continues on page 6.



Chip Redding worked as an IT specialist, getting the joint field office in San Juan, Puerto Rico, up and running.

Billy Hau, center, with fellow FEMA volunteers out on an inspection in Puerto Rico.

Glenn Volunteers Assist FEMA (continued)

Keith Martin, left, and another FEMA volunteer stand on top of one of the many collapsed bridges in Puerto Rico.

"I've been through three hurricanes, but I'd never seen anything like this before."

Dan Fuller, Puerto Rico

Michael Perez prepares to make fuel delivery in Puerto Rico.

"Officially, I was an individual assistance specialist to help people with their FEMA applications. Unofficially, I was someone people could talk to."

Jason Ondercik, Texas

On the Cover:

Glenn's Eric Faykus delivers food to families in need of basic supplies while canvassing communities in San German, Puerto Rico.

GRC-2017-CN-00078

Portions of this article were taken from Nancy Smith Kilkenny's article on the Glenn website, ***https://go.nasa.gov/2z5A5wj****.*

By Doreen B. Zudell

NASA Glenn Volunteers

CALIFORNIA

Dale Dragony, Mechanical Systems Design and Integration Branch: Disaster Survivor Assistance and Housing Task Force

Dan Sutliff, Acoustics Branch: Disaster Survivor Assistance and Housing Task Force

FLORIDA

Carl Blaser, Mechanical Systems Design and Integration Branch: environmental and historical preservation

Bethany Eppig, Environmental Management Office: environmental and historical preservation

John Richard Leigh Gatto, NASA Safety Center: Disaster Survivor Assistance

Anthony Roberts, Advanced High Frequency Branch: environmental and historical preservation

MISSISSIPPI

Tracy Cantley, Facilities Fabrication Engineering and Process Branch: logistics, coordination of assignments for FEMA volunteers

PUERTO RICO

Linda Bartos, Facilities Test Division: logistics, Disaster Recovery Center

Shannon Eichorn, Facilities Test Division: individual assistance, Disaster Recovery Center

Eric Faykus, Engineering and Operations Branch: disaster report analysis and where needed

Dave Fuller, Science and Space Technology Systems Branch: local government, U.S. Army Corps of Engineers, Puerto Rico Emergency Management liaison

Billy Hau, Diagnostics and Electromagnetics Branch: Water Task Force

Keith Martin, Engineering Management Branch: logistics, generators and electrical repairs, Army Corps of Engineers

Michael Perez, Aerospace Test Branch: logistics, fuel specialist

Chip Redding, Mechanical Systems Design and Integration Branch: IT specialist

TEXAS

Amy Hitabidel, Technology Transfer Office, public assistance, reimbursements

Jason Ondercik, Engineering Management Branch: individual assistance for application forms, resources and services

VIRGIN ISLANDS (St. John)

Robert Kohler, Technical Services Branch: evaluation and assistance

Younes Hosts SCaN All Hands Meeting

Badri Younes, NASA Deputy Associate Administrator for Space Communication, pictured, visited Lewis Field, Dec. 14. He held a Glenn Space Communications and Navigation (SCaN) All Hands meeting in the MIC Auditorium. His presentation, titled "Decade of Light," detailed the agency's current work and future vision for enabling efficient and reliable space communications.

GRC-2017-C-10008
Photo by Rami Daud

NEWS AND EVENTS

Fischer Captivates Audience With Post-Mission Briefing

Expedition 51/52 Flight Engineer Jack Fischer attracted nearly a full house of employees and Girl Scouts of North East Ohio (GSNEO), to the MIC Auditorium, Jan. 18, for his post-flight mission briefing. He engaged the audience with video and entertaining accounts of an "awesome" 5-month experience aboard the International Space Station (ISS). Fischer reflected on the teamwork and attention to detail from ground support while working on the S.S. John Glenn cargo/supply ship, which carried two of the center's experiments—Zero Boil-Off Tank and Spacecraft Fire Experiment-III. Also notable was the highlight of the on-orbit renewal of his wedding vows for his 20th anniversary. Following the employee briefing, Fischer answered questions from the GSNEO guests, with whom he communicated via amateur radio, June 23, during the mission.

GRC-2018-C-00196

Colonel Fischer shares highlights of his Expedition 51/52 mission.

Photo by Rami Daud

New App Takes Visitors on Mission to STEM

Visitors travel out of this world using the new app at the Glenn Visitor Center.

Looking for some science-based indoor fun for the kids? A new mobile app at the Great Lakes Science Center (GLSC) allows you to explore the NASA Glenn Visitor Center like never before! Explore inside the Apollo capsule and navigate like an astronaut or run a space station experiment like a scientist. The app, using virtual and augmented reality, offers exploration into six NASA artifacts and is available on iOS.

Learn more about the app at **http://greatscience.com/explore/events-programs/nasa-glenn-visitor-center-app**, and then take the kids to the GLSC to experience it firsthand!

Agency Unveils 60th Anniversary Logo

NASA marks the 60th anniversary of its establishment as a U.S. government agency in 2018. President Dwight D. Eisenhower signed NASA's founding legislation, the 1958 National Aeronautics and Space Act, on July 29, 1958. NASA considers its birthday to be Oct. 1, the day the agency opened for business.

NASA has released an official logo for use in observing this milestone anniversary. Created by NASA graphic artist Matthew Skeins, the logo depicts how NASA is building on its historic past to soar toward a challenging and inspiring future.

Check future *AeroSpace Frontiers* issues and *Today@Glenn* for announcements about how Glenn will be celebrating this milestone—and how you can get involved.

For more information on the logo, visit **https://www.nasa.gov/feature/nasa-releases-logo-for-upcoming-60th-anniversary**.

GRC-2018-CN-00090

Delta Blue offers a variety of homemade entrees, sides, salads and soups.

GRC-2018-CN-00089 Photos by Doreen Zudell

City Club Catering offers employees freshly made Greek fare.

Two Food Vendors Serving in Cafeteria

The Delta Blue Seafood & Barbeque and City Club Catering are currently operating in the service area of the Glenn Café every weekday from 11 a.m. to 1:30 p.m.

Delta Blue offers hot homemade entrees such as Memphis barbeque pulled pork, baked Alaskan salmon and southern fried chicken, with an array of sides selections, salads and soups. City Club Catering offers freshly made lamb and chicken gyros, Greek salads, fresh hummus and pita and more.

Cash or credit cards are accepted by both vendors. Keep checking *Today@Glenn* and the Glenn Exchange website for a complete menu.

The NASA Glenn Exchange is still in the process of identifying a permanent alternative for providing food services at the center. In the meantime, please direct any questions to the Exchange Operations Manager, Krasynthia K. Johnson, 216–433–5083.

NEW! Delta Blue is now serving breakfast in the cafeteria from 7:30 to 10:00 a.m.

NASA: Best Place to Work

NASA has been named the Best Place to Work among large federal agencies for 6 years in a row. According to rankings compiled by the Partnership for Public Service, NASA earned an employee engagement score, or happiness rating, of 80.9 out of 100 in 2017!

RETIREMENTS

Kabak

Kosakowski-Cook

Helen J. Kabak, Center Operations Directorate, retired Dec. 31, 2017, with 29 years of service.

Sandra L. Kosakowski-Cook, Research and Engineering Directorate, retired Dec. 31, 2017, with 34 years of service.

Catherine C. Lewis, Science and Space Technology Systems Branch, Systems Engineering and Architecture Division, retired Jan. 31, 2018, with 10 years of service.

Joe Zoeckler, Fluid and Cryogenic Systems Branch, Propulsion Division, retired Dec. 29, 2017, with 31 ½ years of federal service, including 28 ½ with NASA.

PROMOTIONS

Evans

Michael A. Evans has been selected Spectrum Analyst in the Space Communications and Spectrum Management Office. Evans previously served as the lead wave-form developer for a number of in-house Space Communications and Navigation (SCaN) Testbed experiments.

AWARDS

Two Glenn Employees Are SFA Team Award Honorees

Stephen Ryan and **Christopher Fulton** were honored with a Space Flight Awareness (SFA) Team Award, Dec. 7, at NASA's Marshall Space Flight Center. They were recognized as members of the Mission and Fault Management (M&FM) Test Group cited "for exceptional dedication to quality, rigor and process improvement in testing of the M&FM Model for the Space Launch System."

Ryan, Aeronautics and Ground-Based Systems Branch, and Fulton, ZINT/Intelligent Control and Autonomy Branch, developed code for the M&FM Vehicle Management End-to-End Testbed to unit test M&FM algorithms.

The SFA Team Award recognizes small groups of employees that have demonstrated exemplary teamwork while accomplishing a particular task or goal in support of the human space flight program to ensure flight safety and mission success.

MORE THAN A MEMORY

Paul R. Aron, 86, a 1994 retiree with 31 years of service, died Nov. 11, 2017. Aron performed pioneering research on high temperature superconductivity (HTS) materials applicable for aerospace systems. He served as deputy manager for the center's HTS technology program and helped develop the secondary-ion mass spectrometry (SIMS), a laser device used to collect data on the composition of solid surfaces and thin films to analyze the magnetic field of these materials. Aron retired as deputy chief of the Photovoltaics Branch, Power Technology Division.

John C. "Jack" Estes, 87, a 1991 retiree with 29 years of service, died June 26, 2017. Prior to joining NASA, Estes was a U.S. Air Force veteran of the Korean War with extensive experience in the aircraft industry. He primarily supported launch vehicles, including the Atlas-Centaur and Shuttle-Centaur programs, before retiring as chief of the Operations and Special Projects Office, Space Station Directorate. Estes also oversaw the genesis of the center's work package for power systems operations on the International Space Station.

Estes

Upcoming Center Events

Help Staff the FIRST Robotics Buckeye Regional Competition!

FIRST POWER UP

PLAY FOR REAL

March 29–31

Cleveland State University's Wolstein Center

Game Theme: Teams are trapped in an 8bit video game and use power cubes to defeat the boss!

Over 60 high school teams and 1,500 students will participate in this annual STEM event.

Staff are needed in various positions around the field and in the pit area. Any time you can offer in this NASA-supported event would be appreciated. FIRST Robotics is an incredibly fun and satisfying activity!

For more information and to register, visit **http://www.oai.org/firstbuckeye/volunteers.html.**

POCs: Stephanie Brown-Houston, 3–8006, or Tim Dedula, 3–3668

New Year, New Technology

The annual NASA Technology Expo is quickly approaching!

Thursday, March 1 • 10 a.m. to 2 p.m.

Main Cafeteria, Building 15

Learn about the latest in emerging technologies, view live demonstrations and speak with industry experts. Hosted by the Office of the Chief Information Officer.

To Register: **www.federalevents.com/nasaglenn**

POC: Robert Piccus, 3–5539

WOMEN'S RETIREE LUNCHEON

The next Women's Luncheon is Thursday, Feb. 15 at 1 p.m. at the 100th Bomb Group, 20920 Brookpark Rd. Please reserve your place by notifying Gerry Ziemba at 330–273–4850 or gto64gerry@yahoo.com.

GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting Building 49, Feb. 20 to March 1. 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

MARCH OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct an audible mass notification test on the "all clear" tone on Saturday, March 3, at Lewis Field. An outdoor "voice" test will be conducted at Building 15 on Wednesday, March 7.

POC: Allen Turner, 3–6826

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, March 14, noon, in the Glenn Employee Center's Small Dining Room.

Deadline for next calendar section is **Feb. 16, 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.

ISS Research Update: ACME…Flame On!

ISS Flight Engineer Paolo Nespoli configures the CIR to enable the first ACME project experiments.

Room for one more. Glenn's ISS Research team has taken responsibility for a new addition to NASA's Advanced Combustion via Microgravity Experiments (ACME) project.

Located in the Combustion Integrated Rack (CIR) aboard the International Space Station (ISS), the ACME hardware was developed to enable five unique experiments for researchers at universities from across the country. It is remotely controlled from Glenn's ISS Payload Operations Center and the resulting flame data could lead to improved fuel efficiency and pollutant reduction.

"Despite some startup challenges, we've successfully ignited over 50 flames and acquired a sixth ACME experiment," explained ACME Project Scientist Dennis Stocker. "During 2018, we plan to carry out the Coflow Laminar Diffusion Flame (CLD Flame) and Electric-Field Effects on Laminar Diffusion Flames (E-FIELD Flames) experiments and start the Burning Rate Emulator (BRE) experiment."

CLD Flame and E-FIELD Flames are two of the five experiments designed to improve our understanding of flame behavior for practical benefits on Earth. CLD Flame will extend the range of flame conditions that can be accurately predicted, especially under conditions where the flame is sooty or could become unstable. E-FIELD Flames will investigate how an electric field can be used to control flames, through their naturally occurring ions, to reduce pollutant emission. The BRE experiment is focused on flammability to help us improve spacecraft fire safety.

The additional ACME experiment, formally titled "Spherical Cool Diffusion Flames Burning Gaseous Fuels," seeks to expand upon the 2012 discovery of cool diffusion flames in droplet combustion research conducted in the CIR. The new research will explore whether gaseous fuels ejected from a porous spherical burner can similarly yield cool diffusion flames.

Glenn is the lead for NASA's studies of microgravity combustion and fluid physics, and was responsible for the design and construction of the CIR facility and ACME hardware and software. For more information on the project, visit **www.nasa.gov/feature/studying-flame-behavior-in-microgravity-with-a-solid-high-five**.

By S. Jenise Veris

Emergency and Inclement Weather Lines

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

Connect With Glenn