National Aeronautics and Space Administration

AeroSpace FRONTIERS

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Raising Our Safety and Health Awareness

June is National Safety Month, and this year we are pleased to welcome former astronaut Rex Walheim and Pete Allen as our guest speakers for our Safety and Health Awareness event at Lewis Field on June 26 and Plum Brook Station on June 27. Both speakers serve as Deputy Director for Safety and Mission Assurance, Rex at Johnson Space Center and Pete at Marshall Space Flight Center. This year's event includes agency mishap case studies, and concludes on June 28 with the annual Health Walk at Lewis Field. Please join in the discussions, activities and interesting presentations!

Let us continue our journey to safety, health and mission success.

Engineers Sal Oriti, seated, and Scott Wilson examine the performance of a Stirling-cycle machine that has operated for over 12 ½ years without maintenance or degradation.

Photos by Bridget Caswell
GRC-2018-C-02342

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

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Stirling Engine Sets Records for Operation

There are no gas stations or mechanics in deep space. So, if you want the power to perform science in the deep, dark frontiers of our solar system, you need an engine that is reliable for the long haul.

NASA Glenn engineers have set a run-time record for a free-piston Stirling engine at full power, with over 110,000 hours of cumulative operation, since 2003. That is over 12 years, and it is still running without issue. This device also set a record as the longest-running heat engine in the history of civilization, with no maintenance required!

"This length of time is important because NASA science missions that travel to outer planets take many years," explained Sal Oriti, Thermal Energy Conversion Branch. "The Stirling-cycle machine was designed to operate at full power for at least 17 years."

How does it work? A radioisotope element provides heat energy and the Stirling engine converts it to electricity. Two pistons inside the engine move continuously at high frequency, but there is no contact with other parts. Engineers have virtually eliminated the mechanisms of wear and tear.

Small and lightweight, these engines can operate on science mission spacecraft that need electrical power to run optics, sensors, recording devices and communications systems to get data back to scientists on Earth. Potential future missions that could use this type of power system technology include a Europa lander, or a Lunar rover capable of exploring permanently shadowed regions.

"We are demonstrating that it is possible to build an engine that does not wear out on the time scale needed for NASA missions," said Oriti. "Our goal is to improve state-of-the-art technology to enable the next generation of science missions in deep space."

By Nancy Smith Kilkenny

On the Cover:

Engineer Sal Oriti examines test setup for continuous operation of a Stirling-cycle machine. Glenn engineers set a run-time record for the engine at full power, with over 110,000 hours of cumulative operation, since 2003.

GRC-2018-C-02346

Photos by Bridget Caswell
GRC-2018-C-02256

News Conference Highlights Nuclear Fission System for Space Exploration

Panelists, left to right, Reuter, Gibson, Dr. Poston and Cahalane provide project highlights and take questions from the media during the news conference.

NASA and the Department of Energy's National Nuclear Security Administration (NNSA) have successfully demonstrated a new nuclear reactor power system. The system could enable long-duration crewed missions to the moon, Mars and destinations beyond.

"This demonstration ushers in a new era of exploration… helping us to explore our solar system like never before," said Center Director Dr. Janet Kavandi at a news conference at Lewis Field, May 2.

During the conference, NNSA–NASA team members announced the results of the demonstration, called the Kilopower Reactor Using Stirling Technology (KRUSTY) experiment. The Kilopower experiment was conducted at the NNSA's Nevada National Security Site from November 2017 through March 2018.

Kilopower is a small, lightweight fission power system capable of providing up to 10 kilowatts of electrical power—enough to run several average households—continuously for at least 10 years. Four Kilopower units would provide enough power to establish an outpost.

NASA's Jim Reuter, acting associate administrator, Space Technology Mission Directorate; and NNSA's Patrick Cahalane, deputy associate administrator, Safety, Infrastructure and Operations, provided remarks. They then joined subject matter experts Glenn's Marc Gibson, Kilopower lead engineer; and NNSA's Dr. David Poston, chief reactor designer, Los Alamos National Laboratory, on a panel to address questions from the media.

"When we start sending astronauts for long stays on the moon and other planets, that's going to require a new class of power that we've never needed before," Gibson said. "This test exceeded our performance expectations, and moved us closer to this goal."

Tours of Glenn's Stirling Research, Electric Propulsion and Simulated Lunar Operations Laboratories followed the news conference.

GRC-2018-C-02332

Project manager Diane Linne, In-Situ Resource Utilization Project for Advanced Exploration Systems, explains to reporters that Kilopower could provide power to produce water, oxygen, fuel and other consumables using the resources on the moon or Mars.

This is the first nuclear-powered operation of a new fission reactor concept in the United States in 40 years.

For more information about the Kilopower project, including images and video, visit:
https://www.nasa.gov/directorates/spacetech/kilopower.

Glenn Employees Efforts Merit

FEB Wings of Excellence

Cleveland's Federal Executive Board (FEB) saluted eight Glenn employees as 2018 Wings of Excellence honorees during the 32nd annual Recognition and Awards Program, May 4. Honorees were selected based on outstanding performances, either on or off the job, inspiring others and/or bringing credit to the Federal service over the past year.

Photos by Barb Breen, NEOVAHS


Clapper


DeJesus


Fries


Lajeski


McCray


Melis


Moxley


Rice

Carrie Clapper, Program/Project Integration Office, for promoting the value of federal service as project manager for Glenn's Space Communication and Navigation (SCaN) Summer Intern Program (SIP) and collaborations with the Girl Scouts of Northeast Ohio. Under her leadership, SIP has grown into a solid mentoring and young career succession plan that is the declared model for other NASA centers.

Brunilda DeJesus, Technology Transfer Office, for consistently utilizing her skills and expertise as an agreement manager to efficiently facilitate partnerships with a wide variety of customers. Attention to detail, organizational skills and interactions with people of different cultures and management levels has earned her high praise. DeJesus takes great pride inspiring the direction of Glenn's Hispanic community, and is dedicated to a diverse workplace.

Barbara R. Fries, Human Capital Development Division, for providing outstanding organizational development services to the agency and Glenn, as well as leading and participating in a number of community outreach activities. She shares a ministry with her husband contributing their own time and resources to support approximately 150 underprivileged and homeless people in Slavic Village through several food-centered events.

Kelly L. Lajeski, Accounting and Reports Branch, for utilizing analytical abilities to solve complex accounting problems, which improved Accounts Receivable, Grants Management and Liability reporting. As Glenn's OCFO Community Service Coordinator, she organizes community service activities with a variety of local charities, which increased camaraderie between employees, provided vital charitable assistance, and demonstrated Glenn's support to the Northeast Ohio community.

Sharon A. McCray, Facilities Maintenance Management Branch, for being an excellent communicator and her professional interactions as a program specialist and alternate contract officer's representative for the Central-Process, Recertification, Operations and Maintenance Contract. She proactively orchestrates resolutions to problems within the areas of Pressure Vessel Systems and Central Process Systems. McCray also provides inspiration and encouragement as a FEB tutor.

Matthew Melis, Structural Mechanics Branch, for technical contributions in aerospace engineering and sustained commitment to teaching and public outreach. A notable resource on space shuttle history, Melis has served as a consultant/narrator for NASA Glenn history film productions and external documentaries. He produced an online SATERN version of his course, GRC104, on lessons learned from the *Challenger* and *Columbia* shuttle accidents.

Michael E. Moxley, Center Operations Directorate, for outstanding performance and innovative practices as program manager for Glenn's Lean Six Sigma Office. Moxley led the completion of 15 key events and provided guidance and mentorship on 53 major projects agencywide. Projects represented significant cost savings or avoidance, heightened efficiency and reduced waste for a savings of $4.5 million.

Rowena M. Rice, a retiree from the Occupational Health Branch, for developing and implementing a safety and health program for student interns—one of the first of its kind in the agency. She demonstrated exceptional effectiveness in communicating information to ensure safe work experiences and made continuous improvements for a long-standing record of low injury and illness case rates agencywide.

By S. Jenise Veris

Event Showcases Multigenerational Perspectives

Photo by Marvin Smith
GRC-2018-C-01749

Harvey Schabes, left, facilitates open dialogue among panelists: left to right, Dr. Sheila Bailey, Dr. John Betterson, Nikki Welch, Len Miller and Ashley Cantor.

Do you view working with different generations as an opportunity or a challenge? A multigenerational panel of employees addressed that question during "GRC Connections: Learning From Each Other—Sharing Life Experience, Values and Ideas," at the Briefing Center, April 19. Co-sponsored by the At Glenn Culture Matters Committee, the event empowered panelists—representing Generation X, millennial, Gen Y, baby boomer and traditionalist generations—to share unique perspectives based on their generational predisposition and orientation on a variety of topics.

NEWS AND EVENTS

Left to right, Gafta, Glenn SMA Director Anita Liang and Plum Brook Station Director Dave Stringer, talk after Gafta's presentation at Plum Brook.

GRC-2018-CN-00016 Photo by Doreen B. Zudell

Lunch and Learn Sessions Focus on Spaceflight Safety

How has human spaceflight safety advanced through the years? Chief Safety and Mission Assurance (SMA) Officer of Exploration System Development, Human Exploration and Operations Mission Directorate George Gafta, shared his personal reflections on that topic at Glenn last month. During Lunch and Learn sessions at Lewis Field and Plum Brook Station, Gafta took audiences through a historic journey on how safety and the role of risk management personnel have evolved in NASA's human spaceflight era.

Cultivating Programming and Computing Skills

Photo by Bridget Caswell
GRC-2018-C-02120

NASA Glenn's Space Communications and Navigation (SCaN) Policy and Strategic Communications team hosted Girls in Information Communications Technology (ICT) Day at Hyland Software in Westlake, April 28. Approximately 80 girls, grades 7 to 12, participated in robotic coding, webpage building and mentoring sessions by Glenn and Hyland staff. Girls experienced augmented reality from Glenn's Graphics and Visualization Lab and learned about Arduino hardware and software from Hyland. Best Buys' Geek Squad showcased 3D printing capabilities and Comsat Architects shared career possibilities. The Laser-Based Space Communications game challenged participants to relay the laser signal from Mars to Earth around obstructions.

Interns and Faculty Come Aboard!

NASA Glenn welcomes its 2018 summer interns and faculty this month!

The first group of Lewis' Educational and Research Collaborative Internship Project (LERCIP) interns came aboard June 4. The second group joins the NASA team on June 11.

The NASA Space Academy at Glenn; NASA Glenn Aeronautics Research and Engineering Student Team Project; NASA Aeronautics Scholarship and Advanced STEM Training and Research Fellowship; and the NASA Glenn Faculty Fellowship Program welcomed summer staff on June 4.

Mark Your Calendar!

NASA 60th Anniversary Activities

NASA marks the 60th anniversary of its establishment as a U.S. government agency this year! Over the next few months, Glenn is celebrating through a variety of internal and external events and activities. Here's what is ahead…

60th x Six Lunch Series

June 20, July 11, Aug. 8, Aug. 29 and Sept. 12

- Hear from prominent women in Northeast Ohio and NASA Glenn. Geared toward women, but all are invited to attend.
- Each discussion focuses on just one word.
- Limited seating—60 employees and interns per session.
- Registration required; bring lunch or order from menu.

POC: Debbie Lockhart, 3–8655

Family Day

Saturday, Aug. 25

- One-day event at Lewis Field
- Current employees with limited number of family members; registration required
- Tours, activities, exhibits, demonstrations, food vendors
- **Staffing needed for this event**

POC: Dovie Lacy, 3–5163

Center Picnic

Thursday, Aug. 23

- Rain date on Friday, Aug. 24
- Retirees welcome—spread the word!
- **Staffing needed for several shifts that day**

POC: Betsy Lavelle, 3–3198

Official Weekend of NASA 60th Anniversary

Saturday, Sept. 29

Great Lakes Science Center (GLSC)

NASA 60th anniversary celebration at GLSC—tell your family and friends!

Special Tour of Lewis Field

Special tour of NASA Glenn's main campus for up to 200 guests (not open to employees and their families). To participate in the tour, guests must have a ticket called a Golden Astronaut. Tickets distributed at designated outreach events this summer.

Staffing needed for both events.

POC: Carlos Gomez, 3–6445

Stay tuned to *Today@Glenn* for details on all events.

GRC-2018-C-01942 Photo by Rami Daud

H4H chili chefs, left to right (front): Long-Davis, Shaw, Falcon, Price and Fertitta; (back): Velez, Davidson, Sessa and Pais.

Chili Cook-Off Heats Up Donations to H4H Campaign

Glenn employees at Lewis Field and Plum Brook Station (PBS) generously donated a total of 1,939 pounds of food to the 2018 Harvest for Hunger (H4H) campaign, held March 26 through May 11. Glenn's donation will provide significant support to the Greater Cleveland Food Bank's goal of raising enough food for 22 million meals to feed the needy in Cuyahoga and five nearby counties.

Nearly 500 pounds of food was donated in just 1 hour, April 26, during the Lewis Field Chili Cook-Off, a popular source of fundraising for past campaigns dating back to 2002. Nine volunteers cooked and served their favorite chili recipes to help raise food donations, via a can good per vote, and to earn bragging rights to the Golden Spoon medal.

Participants included: Andrea Price, Office of the Chief Financial Officer; Larry Davidson, Anna Falcon, Vincetta Fertitta and Jeffery Pais, Center Operations Directorate; and Mary Jo Long-Davis, Heidi Shaw, Joseph Sessa and Nicole Velez, Research and Engineering Directorate. Price's creamy white chicken chili took first place with Falcon's traditional red sauce beef chili a close runner up.

After the campaign, Eliot Aretskin-Hariton, Glenn's H4H campaign coordinator, thanked our civil servants and contractors for their donations and encouraged them to consider volunteering at the Food Bank. To sign-up with the Glenn team for an event on Saturday, Aug. 11, contact Dana Ganelli at 3–5382 or at dana.h.ganelli@nasa.gov.

By S. Jenise Veris

Some of the 140.5 lbs. of PBS food donations coordinated by H4H committee member Geneva Biglin.

Photo by Geneva Biglin
GRC-2018-CN-00017

RNASA Stellar Awards

GRC-2018-CN-00019

Kimbrough, right, presents Dr. Ruff with the Stellar Award

The Rotary National Award for Space Achievement (RNASA) Foundation recognized NASA Glenn's **Saffire Project Team** among its Stellar Award honorees for outstanding achievements in space and creating greater public awareness of the benefits of space exploration. Astronaut Colonel Shane Kimbrough presented the award to Dr. Gary A. Ruff, attending on behalf of the team, in Houston, April 27.

The team was cited for innovative contributions to new approaches in the successful design, build and operation of the Saffire I, II and III experiments and achieving complete mission success. The Saffire missions were a series of large-scale flammability experiments designed and built at NASA Glenn. The experiments contribute to a body of knowledge that creates a safer environment for human exploration by preventing spacecraft fires.

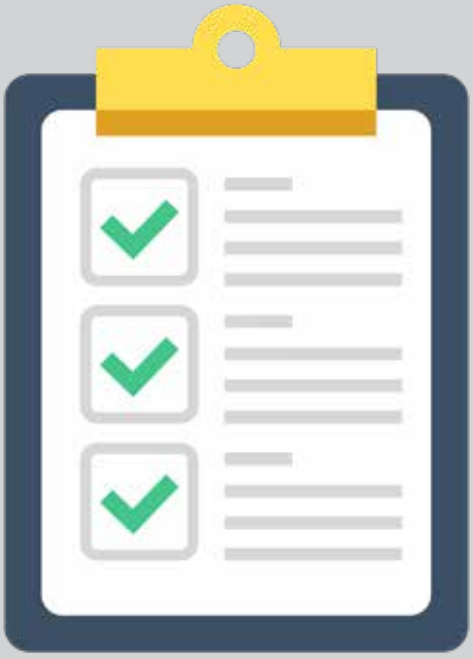
Edmond Wong, Intelligent Control and Autonomy Branch, was a nominee for an individual Stellar Award in the Late Career Achievement category. He was nominated for outstanding contributions to the development of sensor data qualification capabilities to ensure crew and vehicle safety for NASA's Space Launch System Program.

Visitor Check-Off List

The season of picnics and other festivities at NASA Glenn is upon us, making it a good time to remind employees and visitors of the rules for gaining access to Lewis Field (LF) and Plum Brook Station (PBS):

- All visitors, including NASA retirees, require a NASA sponsor to gain access into LF and PBS.
- A sponsor is defined as a badged (Personal Identity Verification (PIV)) NASA civil servant or onsite support service contractor.
- A sponsor is required to submit a visitor request using the online Official Visitor Request Form, stating the name of the visitor(s) and building the guest(s) will be accessing.
- Visitors must be U.S. citizens and show proper identification when checking in at the Main Gate.
- A sponsor is responsible for the visitor at all times.

For questions regarding these rules, contact Del Simonovich, 3–5049.



AWARDS

GSNEO's Chief Operating Officer Emily Fein, left, poses with Dr. Nazario.

Dr. Margaret "Meg" Nazario, Space Science Project Office, was one of 10 women honored at the Girl Scouts of North East Ohio's (GSNEO's) annual Women of Distinction Awards Luncheon, May 18. The honorees were recognized as excellent role models in our communities. Nazario's award highlighted her efforts to mentor, nurture and inspire girls and young women.

Photo by GSNEO
GRC-2018-CN-00020

MORE THAN A MEMORY

Korhely

William M. "Bill" Korhely, 87, a 1991 retiree with over 40 years of NASA service, died Dec. 3, 2017. Korhely was a NACA/NASA apprentice who graduated in 1952 to become a flight propulsion mechanic in the Test Installation Division. Throughout his NASA career and later as a contractor, Korhely supported testing in the 10- by 10-Foot Supersonic Wind Tunnel (10X10 SWT)—from inlets and nozzles to full-scale jet and rocket engines. He received several Group Achievement Awards as a member of the 10X10 SWT test team.

Weiland

Sally Ann Weiland, 78, a 2001 retiree with 25 years of government service, died April 28. She retired from Glenn's High Speed Systems Office after 22 years of NASA service providing management support to several organizations. During her tenure, Weiland shared her skills as a mentor through the Essential Connection Quality Circle, an officer for the Special Children's Fund and as the secretary of the center's LESA Union. She also earned recognition in several Group Achievement Awards.

Whipple

Daniel L. Whipple, 74, a 2001 retiree with 36 years of NASA service, died May 6. Whipple was the center's expert in the rapidly evolving field of computational fluid dynamics, which aided development of spacecraft leading to the space shuttle. Whipple led the development and implementation of the center's ERBNET and DESNET computer networks and was instrumental in other activities that enhanced the center's computational capabilities. He also pursued research in aircraft icing and laser velocimeter development for use with propellers.

Upcoming Center Events

GSEL MOBILE LIBARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 162 through June 14 and building 3 from June 19 to 28. A Glenn reference librarian will be ready to assist employees with subject searches and other information needs.

POC: Robin Pertz, 3–5776

COFFEE AND CONVERSATION

The Glenn Science and Engineering Library's next Coffee and Conversation is Monday, June 18. Glenn Exhibit Technician John Oldham will offer an informal chat about his work, 11 a.m. to noon in the library, building 142.

POC: Robin Pertz, 3–5776

JULY OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct an outdoor mass notification "voice" test at building 3 on Wednesday, July 4 at Lewis Field. An audible siren test on the "area evacuation" tone will be conducted on Saturday, July 7.

POC: Allen Turner, 3–6826

IFPTE LOCAL 28, LESA MEETING

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

ACTS BANQUET

Reservations and full payment (cash/check) for the Sept. 14 ACTS 25th Anniversary Banquet are due on Wednesday, Aug. 8. The event will be held at the West Side Irish-American Club, Olmsted Township, 5 to 10 p.m.

For more information, and to get on the email list, contact Alan Hewston at Alan.W.Hewston@nasa.gov, 216–433–3556, or Kathleen Kelley at Kathleen.A.Kelley@nasa.gov, 216–433–5180.

Deadline for next calendar section is **June 20, 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 Mentors Aid NASA's HUNCH Program for Future STEM Workforce

GRC-2018-CN-00018 Photo by Allison Bills, NASA

Hall, second from left, joins the Mount Morris students and their teacher Chef Kingston, at the 2018 HUNCH Final Culinary competition at JSC.

GRC-2018-C-01875 Photo by Rami Daud

Christina Rapenchuk, a senior at MCCC and past HUNCH summer intern in Glenn's Fabrication Division, shows off her school's display table of hardware at the Recognition Ceremony.

A Glenn-mentored team advanced to be one of 10 finalists across the country participating in the 2017–2018 High School Students United with NASA to Create Hardware (HUNCH) Culinary Challenge. With guidance from Glenn's Nancy Hall, the Mount Morris campus culinary arts team from the Genesee Valley Educational Partnership (GVEP) created their breakfast entree "Egg Whites Frittata," for consideration as a meal for astronauts on the space station.

Mount Morris is one of 12 schools from which 20 teams worked on 46 different projects that Hall and Amanda Phelps, in Glenn's International Space Station (ISS) and Human Health Office, mentored during the 2017–2018 HUNCH school year. HUNCH students fabricated flight hardware and soft goods for NASA along with designing prototypes that will improve life on the space station for astronauts. In return, they develop skills that will prepare them for the future workforce in STEM areas.

"As mentors, we ensure the students receive the materials and instructions they need to bring the best ideas for each project together for the Design and Prototype final review at Johnson Space Center (JSC) where NASA engineers, ISS program office, and astronauts review them for standards and quality," Hall explained. Phelps works full time managing Glenn's HUNCH Hardware team, while Hall with three assistants manage the HUNCH Design and Prototype, soft goods and culinary teams.

Glenn hosted a HUNCH Recognition Ceremony, April 21, where projects were on display to recognize team accomplishments. Several local projects were among those recognized: the NASA Sew Technology class at North Ridgeville High School soft goods project, single cargo transfer bags created for astronaut training; and Medina County Career Center (MCCC) students' intricate hardware fabricated to flight specification.

To learn more about the NASA HUNCH program and how you can support your local school's participation, visit **https://nasahunch.com**.

By S. Jenise Veris

Emergency and Inclement Weather Lines

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

Connect With Glenn