



AeroSpace FRONTIERS

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The government shutdown
affected publication of the
January *AeroSpace Frontiers*.

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NASA Day of Remembrance

As we turn the calendar to 2019, we are entering an exciting year in our nation's human space program. NASA's commercial partners, SpaceX and Boeing, are preparing first crew flights to the International Space Station. It is crucial, during this time of preparation, to pause and remember those who sacrificed their lives for exploration, and the indelible lessons learned from the Apollo 1, Challenger and Columbia accidents. Please join me as we remember our NASA heroes. Be reminded that mission success depends on our ability to be vigilant, speak up when there is a technical flaw and incorporate human-in-the-loop in our design and operations.

I am proud of the Glenn workforce for making safety a top priority in the New Year.

Janet

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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Employees Gather, Spread Holiday Cheer

Employees from across the center joined their co-workers for the 2018 Holiday Gathering in the MIC Auditorium at Lewis Field on Dec. 4. The event offered entertainment, refreshments and time to share holiday greetings with one another.



Photo by Rami Daud
GRC-2018-C-10020

Associate Director Janet Watkins shows off her award for being part of the team that won the Pictionary game.



Photo by Rami Daud
GRC-2018-C-10379

On the Cover:

Samantha Yousef, left, on behalf of Glenn's Veterans Awareness Committee, and Sgt. Kevin Dickinson, 3rd Battalion, 25th Marines, assemble boxes of employee-donated toys for area children through the annual Toys for Tots campaign.





Photo by Marvin Smith
GRC-2018-C-09988

Employees send out a wave of "Happy Holidays" during the event.



Photos by Rami Daud
GRC-2018-C-09989



GRC-2018-C-09990

Kizys and Jennifer Maupin produced sweet cupcake designs. Kizys' entry (top) took first place.

Deputy Director Dr. Marla Pérez-Davis, on behalf of Center Director Dr. Janet Kavandi and the senior leadership team, welcomed employees and thanked them for their hard work throughout the year. "This is a time to look back on our accomplishments," she said, "and share some laughs with our NASA Glenn family."

Pérez-Davis introduced a 2018 Center Accomplishments video—produced by the Imaging Technology Center—that reinforced the center's outstanding contributions to NASA's mission.

Members of the U.S. Marine Corps then picked up nine boxes of employee-donated toys for the Toys for Tots campaign. Glenn's Combined Federal Campaign Chairperson Terri Rodgers updated employees on the campaign and thanked them for their generosity thus far.

The gathering offered several fun and interactive highlights, emceed by Mary Anne Sours. The fun began with a Pictionary contest consisting of two teams of employees from several directorates. "The Winners" team took the prize: a certificate entitling them to "Official Bragging Rights." The audience joined in on the excitement by using their mobile devices to vote for their favorite festive attire (Megan Sigetic) and cupcake display (Rita Kizys).

The Glenn String Quartet provided a festive backdrop by playing a variety of songs as employees lightheartedly mingled over light refreshments.

By Doreen B. Zudell



To vote, go to grc2.cnf.io
GRC-2018-C-10021

Contestants vie for best festival attire and share what they like most about the holiday with emcee Sours. Sigetic, far right, was voted most festive.

NASA Glenn Earns Two R&D 100 Awards!

The R&D 100 Awards have served as the most prestigious innovation awards program for the last 56 years. The annual competition recognizes 100 of the most exceptional innovations in science and technology throughout the year.



GRC-2018-C-08642

Photo by Bridget Caswell

*Durable IC Chips for Extreme Environments team:
left to right, Prokop, Spry, Neudeck and Krasowski.*

NASA Glenn has two more R&D 100 Awards to add to its distinguished repertoire after two of its research teams each earned the award at the R&D 100 Conference on Nov. 16. This brings the center's total number of this prestigious award to 125.

The team of Dr. Philip Neudeck, David Spry, Michael Krasowski and Norman Prokop, members of the Smart Sensing and Electronics Systems Branch, earned an R&D 100 for Durable Integrated Circuit (IC) Chips for Extreme Environments. They developed the first and only IC technology proven operational at extremely high temperatures (more than 450 °C) for the greatly prolonged durations (more than 1 year) needed for beneficial insertion of circuitry into previously inaccessible harsh environment applications. This technology will enable numerous benefits in space and here on Earth, including combustion monitoring and control, aerospace, transportation, well-drilling, ground-based power generation, geothermal sensing, robotics and planetary exploration.



GRC-2018-C-08641

Photo by Rami Daud

*LEWICE3D team: left to right, Porter, Wright and Potapczuk.
Not pictured: Addy Jr. (retired) and Bidwell (deceased).*

The team of Colin Bidwell (deceased), Christopher Porter, Harold Addy Jr. (retired), William Wright (Vantage) and Dr. Mark Potapczuk, members of the Icing Branch, earned an R&D 100 for LEWICE3D Impingement and Ice Accretion Software. LEWICE3D is a domestically distributable software tool that simulates how the water droplets from a cloud impact and grow ice on an arbitrary aerodynamic geometry in flight. This software can be applied to the icing analysis and design of aircraft, unmanned aerial vehicles (UAVs), jet engines, probes and icing protection systems. These analyses can also be used to aid in the certification process of these vehicles and components.

For a list of the awardees, visit <https://www.rd100conference.com/awards/winners-finalists/year/2018/>.

New Facility Tour Process in Place

Thinking about scheduling a test facility tour for an upcoming event, meeting or conference?

A new facility tour process has been developed by the Facilities, Test and Manufacturing Directorate. The streamlined process enables guests to visit Glenn's popular research facilities at times that do not conflict with testing, maintenance or other scheduled tours. The goal is to have a calendar available in 2019 to enable users to see scheduled weekday tours, in addition to other system capabilities that allow users to request a tour and receive confirmation.

An internal website provides an overview of the facility tour process, including steps for scheduling and conducting a tour and the definition of authorized tour groups. Glenn civil servant and support service contractors should request tours by submitting a GRC 137 form (with a link inside the website).

Topics you can find on the site include:

- Requesting a tour
- Tour request checklist
- Scheduling a tour
- Conducting a tour
- Authorized tour groups
- Definitions
- Tour information on facilities
- Frequently asked questions



The website is located at <https://www.grc.nasa.gov/f/tx/fxt/tour/>.

Additional questions and feedback on the new process are welcome at grc-cr-facilitiestour@mail.nasa.gov.

Costumed Characters Brigade Marks a Milestone at Lewis Little Folks



Photo by Liz McQuaid
GRC-2018-CN-00060

It was tradition and history in the making when NASA Glenn's Costumed Character Brigade celebrated 20 years of visiting the Lewis Little Folks (LLF) Child Development Center on Dec. 7. Thanks to the dedication of numerous employees, their families and retirees, this tradition has continued long after the yearly holiday shows were discontinued. Special thanks to the core team of Alan Hewston, Liz McQuaid, Carmela Bynum and Nancy Hall, who organized the visits, maintained costumes and secured volunteers over the years.

"The children and families of LLF look forward to the Costumed Character Brigade visit every year," said LLF Director Maureen Sartain. "We are all so thankful to Glenn employees who take the time to volunteer to play these characters for our children!"

At right: Santa (Tom Hinshaw) spends some time with Miles Klein, son of Melissa and Ben Klein.



Photo by Doreen Zudell
GRC-2018-CN-00058

NEWS AND EVENTS

Honor the Past. Be the Future.

Native Paradigms Help Understand Science

Photo by Jordan Salkin
GRC-2018-C-09809



Daniella Scalice, left, Education and Communication lead for NASA's Astrobiology Program, guides Seth Harbaugh, Center Operations deputy, in placing a story card in formation during the 2018 Native American Heritage Month Observance on Nov. 28. Several attendees placed cards in sequence as Dana Maureen Desiderio told a traditional Navajo origin story. Desiderio hopes her work with NASA and Native communities will inspire others to recognize Native paradigms as valid and important in understanding the sciences. Glenn's Advisory Group for Native Americans, in partnership with the Office of Diversity and Equal Opportunity, hosted the event.

Inspiring the Next Generation of Manufacturers



Photo by Jordan Salkin
GRC-2018-C-08823

Careers in manufacturing will continue to play a crucial role in aeronautics and space development. Glenn's Henry Scott, left, shows students parts that were manufactured using the Electro-Discharge Machine during Manufacturing Day at Lewis Field, Oct. 30. Area high school students learned how teams of engineers, researchers and technicians work together to design and prototype aeronautics and space hardware. Sponsored by Glenn's Office of Education; the Facilities, Test and Manufacturing Directorate; and The Manufacturing Advocacy and Growth Network, the day included speakers, panel discussions, engineering demonstrations, augmented reality activities and facility tours.



Photo by Rami Daud
GRC-2018-C-09465

Young Astronauts Learn to Blast Off!

Five, four, three, two, one. Blast off! More than 350 1st- through 12th-grade students from area schools learned about the work astronauts do during Glenn's Young Astronaut Day at Lewis Field on Nov. 3. The daylong event—with lively competitions—was designed to challenge, educate and inspire the next generation of scientists and engineers through several hands-on activities. Guest speaker Grant Slusser shared his experience training astronauts and flight controllers, and what it takes to keep astronauts safe when they perform spacewalks. Sixty-five volunteers from Glenn and Cleveland State University's AIAA student section helped make this event a success.



Apollo Program Reflections

From October 2018 through December 2022, NASA will mark the 50th anniversary of the Apollo Program that landed a dozen astronauts on the moon between July 1969 and December 1972.

Here's a snapshot of the Apollo mission that occurred during January and February in 1971:



Apollo 14

DATE: Jan. 31 to Feb. 9, 1971

MISSION: Landed on the moon

CREW: Shepard, Mitchell, Roosa

To learn more about the Apollo Program, visit https://www.nasa.gov/mission_pages/apollo/index.html.

Editor's Note: Special Combined AeroSpace Frontiers

Due to the government shutdown, Glenn's *AeroSpace Frontiers* staff was unable to publish the January 11 issue. As a result, we have combined the January and February issues into one publication.

Eleven Glenn Employees Honored With Prestigious Silver Snoopy Awards

Center Director Dr. Janet Kavandi joined astronaut Dr. Shannon Walker in presenting 11 members of the Glenn workforce with the NASA Silver Snoopy Award during ceremonies at Lewis Field and Plum Brook Station on Nov. 8.

Each year since 1968, the agency's Astronaut Office awards the Silver Snoopy pin, a sanctioned symbol of spaceflight excellence, to less than 1 percent of the eligible workforce. The following Glenn employees were recognized for their outstanding performance and professional dedication to human spaceflight safety or mission success:

Dr. Stephen Barsi, Chemical and Thermal Propulsion Systems Branch, for his exceptional dedication and technical leadership as NASA propulsion system lead for the Orion European Service Module. Barsi resolved challenging technical issues in support of Exploration Mission-1, increasing safety and reliability while maintaining tight schedules and budget resources.

Brian Bellisario, ZIN Technologies, International Space Station (ISS) and Human Health Office, for his contributions to the Observation and Analysis of Smectic Islands in Space (OASIS) project. Bellisario developed the ink droplet dispenser driver algorithm and supported OASIS during flight operation, developing procedures to translate and deliver massive quantities of experimental ISS data ahead of schedule and under budget.

Andrew (AJ) Fedak, ZIN Technologies, Human Exploration and Space Operations Project Office, for his work as lead electrical engineer on the Medical Consumables Tracking (MCT) project. Fedak successfully designed the electrical aspects of the flight hardware for the radio frequency identification technology demonstration on the ISS and improve the battery performance from 4 to 12 months.

Gerald Hill, Plum Brook Station Propulsion Test Complex manager, in recognition of his work in advocating for and acquiring resources needed for critical facility restoration and enhancement projects. Hill led the effort to develop and demonstrate an innovative and cost-saving way of operating the In Space Propulsion Facility for lander-sized hot-fire testing.

Tina Jicha, Program/Project Integration Office, for exceptional contributions and leadership as business manager and program planning and control lead in the development of the Orion European Service Module. Jicha has consistently exceeded expectations by creating efficiencies for cost, schedule and risk performance as decision-making aids for program management to avoid major impacts.

Robert Kistemaker, Technology Transfer Office, for his outstanding efforts in support of the Commercial Crew Program. As Center Agreements Manager, Kistemaker led the development, approval and implementation of task plans for



Left to right: Astronaut Dr. Walker, Smajdek, Maul, Kistemaker, McMasters, Dr. Tin, Fedak, Barsi, Jicha, Bellisario and Dr Kavandi.

Glenn Research Center agreements with SpaceX, Sierra Nevada and Boeing in excess of \$2 million.

William Maul, Vantage Partners, LLC, Intelligent Control and Autonomy Branch, for his superior contributions leading to the development of the Integrated Vehicle Failure Model for the Space Launch System and new functional fault modeling capabilities that have directly benefited NASA human exploration and operations programs.

Paul McMasters, Vantage Partners, LLC, ISS and Human Health Office, for his project scheduling expertise and leadership for numerous spaceflight hardware and software projects. McMasters has provided key scheduling support to many ISS research projects and has been instrumental in the Orion testing program at Plum Brook Station.

Melani Smajdek, ZIN Technologies, ISS and Human Health Office, for providing invaluable operations planning services in support of numerous Combustion Integrated Rack (CIR) experiments.

Smajdek routinely delivers error-free operations plans and anticipates operational conflicts, along with providing viable workarounds, in support of the CIR operations and science teams.

Richard Sorge, Plum Brook Station, for his role in the successful planning and execution of the Orion European Service Module Structural Test Article (E–STA) space environment test campaign. Sorge also led efforts to activate and commission a new Plum Brook Station Space Environments Complex (SEC) Mechanical Vibration Facility and oversaw a major upgrade of the SEC facility infrastructure systems.

Dr. Padetha Tin, Universities Space Research Association, Low-Gravity Exploration Technology Branch, for serving with distinction as project scientist/science definition lead on the OASIS space experiment. His international collaborations resulted in an expanded microgravity materials research effort and led to a first-of-its-kind discovery of structures and dynamics in liquid crystal films.

By Sandra Mason



Left to right; Plum Brook Station Director David Stringer, Dr. Janet Kavandi, Sorge, Hill and Astronaut Dr. Walker.

OPM Announces New Weather and Safety Leave Regulations



The Office of Personnel Management has announced new regulations regarding when excused leave may be granted to government employees for reasons related to weather and safety. The new weather and safety leave is a form of excused leave that may only be granted when it is determined employees cannot safely perform work at their normal worksite or other approved location (e.g., home when teleworking).

Teleworkers should be prepared to work from home during an anticipated weather and safety event, and will generally be expected to work during a center closure, even if it is not a regularly scheduled telework day for that individual.

NOTE: This new law does not change any eligibility requirements for, or require anyone to participate in, NASA's telework program. Those who are ineligible for the telework program, or who are eligible and do not participate in it, will be granted weather and safety leave during a center closure.

For additional questions about the new weather and safety leave, contact Jerry Traster, Office of Human Capital Management, at 3-3649.

RETIREMENTS



Dr. Ansari



Hill



Nesbitt



Reehorst



Tuttle

Dr. Rafat Ansari, Low-Gravity Exploration Technology Branch, Propulsion Division, retired Dec. 31, 2018, with 17 years of service.

Gerald Hill, Plum Brook Station, retired Dec. 31, 2018, with 37 years of service.

James Nesbitt, Environmental Effects and Coatings Branch, Materials and Structures Division, retired Dec. 31, 2018, with 35 years of service.

Sandra T. Reehorst, acting director, Office of Technology Incubation and Innovation, retired Dec. 31, 2018, with 33 years of service.

Karen Tuttle, ISS and Human Health, Human Exploration and Space Operations Project Office, retired Dec. 31, 2018, with 31 years of service.


MORE THAN A MEMORY



Vertone

Robert H. Vertone, 88, a 1994 retiree with 31 years of NASA service, died Nov. 23. Vertone started at NASA Lewis in 1963 in the Research Instrumentation Branch, Electromagnet Propulsion Division. In the early 1970s, he worked in the Communications Technology Branch, Space Propulsion and Power Division, and was involved in the Communications Technology Satellite. He served in the Propulsion and Power Operations Branch from the mid-1970s until his retirement. Vertone received multiple performance, special act and service awards.

Upcoming Center Events



Women IGNITE Workshop

Wednesday, March 6
9:00 a.m. to 12:30 p.m.
MIC Auditorium (bldg. 162)

Register through SATERN at <https://satern.nasa.gov>.
Course ID: GRC-8G1529.

NASA Home & City TRACE SPACE BACK TO YOU!

This site features about 130 spinoff technologies in a virtual space, allowing users to tour through buildings and rooms to discover common items that NASA inspired or helped improve. These spinoffs are commercial products that apply NASA technology originally developed for studying and exploring space.



Take a peek inside at
<https://www.homeandcity.nasa.gov>.

FITNESS CENTER SLIMATHON

Start off 2019 on the right foot by participating in this 12-week team body fat loss challenge. Form a team, join a team, or be a member of a staff team. Available to NASA staff, family and friends. Deadline for registration is Feb. 15. For more information, call the Fitness Center at 3-6313.

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, Feb. 13, noon, in the Glenn Employee Center's Small Dining Room.

GSEL MOBILE LIBRARIAN

The Glenn Science and Engineering Library (GSEL) Mobile Librarian will be visiting building 5 from Feb. 19 to 28 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

RETIRED WOMEN'S LUNCHEON

The next luncheon is Thursday, Feb. 21, 1 p.m. at JoJo Carloni's, 627 W. Bagley, Berea. Please reserve your place by calling Gerry Ziemba, 330-273-4850 or email gto64gerry@yahoo.com.

OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct an audible siren test on the "all clear" tone on Saturday, March 2 at Lewis Field. A mass notification "voice" test will be conducted in building 15 on Wednesday, March 6.

POC: Allen Turner, 3-6826



Glenn Inventors: the Faces of Technology



Photo by Marvin Smith
GRC-2018-C-09572

Benafan, inventor and honoree, shares insights into his road to success.

During the Fourth Annual Glenn Inventors Recognition Ceremony on Nov. 14, the Technology Transfer Office (TTO) honored many remarkable faces behind NASA Glenn's technology.

The event showcased fiscal year 2017 inventors, including 33 patent applications, 45 for patents issued, 15 for software releases, as well as national, internal and external awards to NASA.

TTO Chief Harvey Schabes kicked off the event, emphasizing that the people recognized are a testament to creativity, skill and persistence in breaking barriers and improving life in space and on Earth.

Associate Director Janet Watkins echoed Schabes sentiments.

"These individuals work in a variety of fields—aeronautics, electronics, communications, materials and more," she said. "While the work they do every day contributes to NASA's mission, what sets these men and women apart is their ability to recognize the importance of their work on a much larger scale. Commercializing innovations goes far beyond a mandate."

Dr. Othmane Benafan, inventor and honoree, shared his personal journey to becoming a NASA inventor and how it led to his accomplishments.

Other guest speakers included NASA Office of Chief Technologist Innovation Lead and Space Technology Mission Directorate Liaison Kenneth Wright and NASA Agency Council for Intellectual Property Mark Dvorscak. They affirmed the hard work and dedication of our researchers and emphasized the commercialization process that often takes years to come to fruition.

By Doreen B. Zudell



Photo by Technology Transfer Office
GRC-2018-CN-00056

Glenn's Office of Chief Counsel plays an important role in helping patent and commercialize technology. Glenn's James Jackson, left, and Agency Council for Intellectual Property Mark Dvorscak, show their support.



Photo by Technology Transfer Office
GRC-2018-CN-00057

Awards and citations.

Emergency and Inclement Weather Lines

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

Connect With Glenn

