



AeroSpace FRONTIERS

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Safely Viewing the Solar Eclipse

On Monday, Aug. 21, a total solar eclipse will cross the country for the first time since 1918. In Northeast Ohio, we will be able to view a partial eclipse—at about 80 percent. When viewing the eclipse, be sure to use a special-purpose solar filter, such as a handheld solar viewer or eclipse glasses. Inspect solar filters before you use them, make sure solar glasses meet all safety requirements, and please supervise children to ensure they use solar filters properly. An alternative method for safe viewing of the partially eclipsed sun is pinhole projection. Visit <https://eclipse2017.nasa.gov/safety> for more information.

By following a few simple steps, we can safely enjoy one of nature's greatest marvels.

Jamie

AeroSpace Frontiers

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

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Glenn Internships: Meaningful Work With Skilled Mentors



Courtney Prebul, Ohio State University senior, interns in the Environmental Effects and Coatings Branch.

GRC-2017-C-03914
Photo by Bridget Caswell

On the Cover: Glenn's Kathryn Oriti, Science and Space Technology Systems Branch, left, oversees Pathways intern Naia Butler-Craig as she builds hardware for the Advanced Electric Bus CubeSat.

GRC-2017-C-03888

Photo by Bridget Caswell



GRC-2017-C-03697

Photo by Bridget Caswell

Heather O'Dell, Florida International University senior, interns in the Office of Communications and External Relations. She is assisting the Community Relations team in the Girls in STEM event.



GRC-2017-C-03874

Photo by Rami Daud

Ken Owens, North Carolina A&T University graduate, interns in the Mechanisms and Tribology Branch.

What makes a great internship?

NASA internships offer educational hands-on opportunities for high school, undergraduate and graduate students, as well as educators. These internships pair participants and career professionals in scientific or engineering research, development and operations activities. Nontechnical internships offer professional activities that support NASA business and administrative processes.

This summer, 240 student and faculty interns are working with Glenn mentors in a variety of disciplines under the NASA Internship Project and Faculty Fellowship Program. Through these internships, participants leverage NASA's unique mission activities and mentorship to increase their professional capabilities and clarify their long-term career goals.

Another great program for students is the NASA Pathways Intern Employment Program. This program is for college sophomores through Ph.D. students who have at least one calendar year left in their schooling prior to graduation. Pathways interns work under the guidance of Glenn personnel performing duties directly related to the field for which they are being trained. A minimum number of hours, completion of their degree and satisfactory work performance allows for the opportunity to be converted noncompetitively.

By Doreen B. Zudell

What makes a great internship? Just ask our interns!

"There are so many projects I can work on."

"I'm applying my knowledge of engineering."

"Everyone in the office is hands-on with me and cares about what I'm learning."

For more information on summer internships, visit <https://intern.nasa.gov/>
For more information on Pathways Internships, visit <https://www.usajobs.gov/>

Intern Conference Offers Information About Glenn



GRC-2017-C-03590

Photo by Bridget Caswell

Glenn interns and faculty gathered in the MIC Auditorium to participate in a Summer Intern/Faculty Conference, June 29. Michael J. Foreman, former NASA astronaut, pictured, kicked off the event with compelling stories about his career and life as an astronaut. He answered questions from students interested in learning more about what it takes to become an astronaut. Participants then divided into groups to attend information sessions according to their interests. Presentations supported the Glenn Core Competencies and highlighted additional NASA opportunities. Glenn's Office of Education and the Higher Education team sponsored the event.

NEWS AND EVENTS

Center Lifts Off 4-H Youth Development Day



GRC-2017-C-03408

A 4-H participant enjoys several STEM-focused, hands-on activities.



GRC-2017-C-03452

Photos by Bridget Caswell

Participants use nonverbal communication to construct a replica of NASA's veggie plant growth system.

Glenn launched its first 4-H Youth Development, Ohio State University Extension Cuyahoga County event at Lewis Field, June 16. The day focused on inspiring kindergarten to 12th grade students to become interested in STEM fields. Engineers John Lekki and Roger Tokars kicked off the event by highlighting research on algal bloom monitoring. Glenn scientists, engineers and Office of Education staff joined more than 150 youth in STEM activities that featured how to grow plants in microgravity, career exploration stations and facility tours.



Girl Scouts Contact Space Station via Amateur Radio

GRC-2017-C-03190 Photo by Marvin Smith

NASA Glenn collaborated with the Girl Scouts of North East Ohio (GSNEO) to enable local Girl Scouts to communicate with International Space Station (ISS) astronaut Jack Fischer via Amateur (Ham) Radio, June 23. Members of Glenn's Space Communications and Spectrum Management Office and Amateur Radio Club, along with Best Buy's Geek Squad, set up the contact and ISS viewing at Camp Timberlane in Wakeman, Ohio. The ARISS (Amateur Radio on the International Space Station) contact was a highlight to a weeklong resident camp promoting STEM skills. More than 400 scouts and family members attended the event, with another 300 tuned in via a live feed. Special guests/speakers included ISS Ham Radio Program Manager and ARISS International Chair Frank Bauer, Deputy Director Dr. Marla Pérez-Davis, Deputy Director of Space Flight Systems Joel Kearns, and GSNEO Chief Operating Officer Barbara Hill. Pictured are the 22 girls who asked the astronaut questions, the ARISS Glenn team and speakers.



GRC-2017-CN-00046

Photo by NASA

A computational model of an airplane engine created by code.

"Trending With Tech Transfer"

Environmental Barrier and Bond Coatings

Connecticut-based Solution Spray Technologies signed a technology license agreement to evaluate NASA Glenn's cutting-edge environmental barrier coating (EBC) system for use in the aviation and land turbine industries. Glenn's Dongming Zhu and Janet Hurst developed the novel coatings to protect components made of ceramic matrix composites from extreme temperatures and the corrosive environment inside an engine. For more information, visit <https://technology.nasa.gov/t2media/tops/pdf/LEW-TOPS-43.pdf>.

Logistics and Maintenance Building Gains New Residents

NASA Glenn showcased new residents in the Logistics and Maintenance Facility, building 351, during an open house, June 28. In April, Glenn's Metrology and Calibration Lab, Janitorial Services and Supply Management Warehouse relocated to a 30,000-square-foot addition to the building. These services joined the Property Disposal Office and Warehouse, which took residency in the original 18,000-square-foot structure in October 2011.

The expansion of this facility is part of Glenn's Facility Master Plan, where older buildings are demolished to make way for newer, more energy efficient buildings. This addition is Phase 2 of a Construction of Facilities three-phase plan. Phase 3 is currently in design, and is planned to house the Fleet Management and Fuel Management services, along with the on-site maintenance services. The Phase 3 project is scheduled for fiscal year 2020 construction funding, and its construction will allow for the demolition of buildings 104 and 107.

Project Manager Kevin Stiles, Facilities Division, said the building has Silver certification by the U.S. Green Building Leadership in Energy and Environmental Design (LEED) Program.

At right: Open house visitors stop to view a display of Skylab food. It is one of many items to be excessed/redirected through the Property Disposal Warehouse.

By Doreen B. Zudell



GRC-2017-C-03568

Metrologist Dale Smejkal demonstrates the equipment used to calibrate load cells from various labs on the center.



GRC-2017-C-03532

Production control specialist Cindy Osinski and Metrology Technician Dan Hughes review and inspect parts entering the Calibration Lab.



GRC-2017-C-03558

Frank Lavalle welcomes Associate Director Janet Watkins to the Supply Management Warehouse.

Plum Brook Tests Part of Orion Launch Abort System

Engineers are currently testing a critical component of NASA's Orion spacecraft at the Reverberant Acoustic Test Facility at NASA Glenn's Plum Brook Station. The ogive panels protect the crew module during ascent as well as from the harsh acoustic and vibration environments experienced during launch. They are part of the spacecraft's launch abort system, which is designed to protect astronauts if an emergency arises during launch or ascent by pulling the crew module away from the rocket. Plum Brook Station facilities are uniquely equipped to replicate, at full scale, the acoustics and vibrations Orion will experience during its missions in space.



GRC-2017-C-03804

Photo by Jordan Salkin



GRC-2017-C-03525

Photos by Bridget Caswell

Jennifer Lademann, facing visitors, highlights features the new building offers for the janitorial staff.

Venus Chamber Breaks Record With Completion of 80-Day Test

After an 80-day test at Venus surface conditions and a 2-week cooling period, samples were removed from the Glenn Extreme Environments Rig (GEER) at NASA Glenn, July 13, nearly doubling the facility's previous duration record of 42 days.



GRC-2017-C-03841

Photo by Bridget Caswell

Leah Nakley looks on as Kyle Phillips removes samples from the GEER chamber.



GRC-2017-C-03860

Photo by Bridget Caswell

Mineral, rock and glass samples are inspected after spending 80 days at Venus surface conditions.

This new record puts researchers one step closer to understanding the effect a long-duration exposure to Venus' atmosphere has on materials. With this knowledge, they can begin to develop technology to allow for future missions to our sister planet.

Researchers from Case Western Reserve University (CWRU) and GEER's engineers worked together to expose 13 minerals, 11 rocks and nine samples of glass to Venus' blazing temperature, high pressure and atmospheric makeup.

The goal is to catalog what reactions take place, further understand how the materials react and which may be viable for future Venus missions.

According to Dr. Ralph Harvey, CWRU Planetary Materials professor, "We're not going to solve all of Venus' problems, but we're going to create a new starting point that may let us and others get there in the future."

GEER, a world-class, ground-based test rig, underwent improvements last spring to enhance the capabilities of the chamber.

"The GEER process system was redesigned to provide a more robust system with even higher accuracy," said Leah Nakley, GEER's lead test engineer. "The 80-day test confirmed the new process system can easily accommodate long-duration tests."

GEER's improvements included adding real-time gas analysis, which allows engineers to monitor changes in gas chemistry and inject gases individually, including water, to adjust the composition at any point during a test.

These modifications enable researchers to make informed decisions regarding the atmospheric requirements for their particular test, ensuring the most accurate results.

"Every test that comes through is unique and the results add one more piece to the puzzle," said Nakley. "We are confident that GEER will help scientists and researchers in future missions to Venus."

By Debbie Lockhart

Congratulations to the CFCLI Class of 2017!



GRC-2017-CN-00045

Photo by Thomas Claflin, Louis Stokes VA Medical Center

Five NASA Glenn employees graduated from the Cleveland Federal Community Leadership Institute (CFCLI) class of 2017 program, June 27. Glenn's Associate Director Janet Watkins attended the graduation ceremony and provided welcoming remarks.

The 9-month intergovernmental leadership and mentoring program focused on teambuilding, learning communication styles, identifying leadership traits, community outreach, and civic engagement to strengthen community partnerships in the Greater Cleveland area. Completing a community service project, in one of five targeted areas, was a condition of graduation. Glenn graduates and their projects include:

Dr. John Betterson served on the At-Risk Youth Team that designed a comprehensive training module for high school students to improve their marketability for future employment. **Stephanie Brown-Houston** served on the Senior Citizen Team that assembled a list of critical service providers to ensure seniors have adequate access to transportation at all times. **Darrell Williams** served on the Veterans Team that supported measures to enhance customer service and updates on the latest technological aides to veterans.

Lizalyn Smith and **Dr. Eric Hendricks** were members of the STEM Education project. They helped develop a workshop and creative badging system based on a "Physics of Flight" course that engaged home-schooled and Cleveland Metropolitan School District middle-school-aged students in STEM education.

By S. Jenise Veris

*Associate Director Watkins with Glenn graduates.
Left to right, Williams, Dr. Betterson, Smith, Watkins,
Dr. Hendricks and Brown-Houston.*



Web-Based Series Receives Award of Excellence

Members of Glenn's Web and Social Media team and Imaging Technology Center received an APEX Award of Excellence for their "Meet the Makers" series. ATS employees Nancy Kilkenny, Bridget Caswell and Rami Daud were recognized for their work in the web-based series that showcases Glenn employees who have developed tools to optimize work processes and move NASA's research forward.

APEX awards are based on excellence in graphic design, editorial content and the ability to achieve overall communications excellence in electronic media and print.

NETS Team Merits 2017 NASA Blue Marble Award



GRC-2017-CN-00043

Photo by Kimberly Gabele

*NETS team, seated, left to right: Kyli Paul, Joseph Homan and Bella Fallner.
Standing, left to right: Ronald Coulter, Robert DiBacco, Tariqul Islam,
Robert Purgason and Michael Taich. Not pictured: Mark Schoppet, NASA HQ.
The Blue Marble award, a glass replica of the Earth, sits on the table.*

The team that developed and maintains the NASA Environmental Tracking System (NETS) received the 2017 NASA Blue Marble Award in the category of "NASA Environmental Director's Environment and Energy." NETS is a web-based application developed and hosted at NASA Glenn for the past 20 years.

NETS is the central repository for internal and external recurring data calls across all areas of environmental reporting. The system is easily customized to meet the ever-changing reporting requirements of NASA's environmental communities of practice.

NASA's Blue Marble Awards recognize groups and individuals demonstrating exceptional environmental leadership, often behind the scenes, to support NASA goals and mission success.

RETIREMENTS



Veres



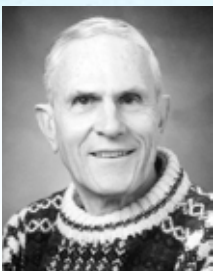
Wolff

David A. Petrarca, Mechanical System Design and Integration Branch, Materials and Structures Division, retired July 7, 2017, with 34 years of service.

Joseph P. Veres, Turbomachinery and Turboelectric Propulsion Branch, Propulsion Division, retired June 30, 2017, with 27 years of service.

Frederick J. Wolff, Power Management and Distribution Branch, Power Division, retired Aug. 2, 2017, with 32 years of service.

Attention Retirees! To electronically subscribe to *AeroSpace Frontiers*, email grc-aerospacefrontiers-subscribe@lists.nasa.gov.

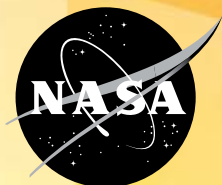


Dr. Warshay

MORE THAN A MEMORY

Dr. Marvin Warshay, 83, a 1998 retiree with 36 years of service, died July 11. Warshay retired as chief of the Electrochemical Technology Branch. He authored/co-authored over 40 technical reports on topics related to advanced energy production and conversion. He received NASA's Exceptional Service Medal for his technical and managerial excellence in the development of multi-megawatt terrestrial phosphoric acid fuel cell power plants. Warshay also co-chaired a committee to establish the Lewis Engineers and Scientists Association (LESA).

Upcoming Center Events



Solar Eclipse Monday, Aug. 21

NASA Glenn's Community Relations team will be in the community to support three events in celebrating the amazing solar eclipse by providing interactive activities, safe viewing glasses and Subject Matter Experts!

Cleveland Metroparks—Edgewater Park

6500 Cleveland Memorial Shoreway, Cleveland

Aug. 21: Solar Eclipse Viewing, 1 to 4 p.m.

Watch the moon's shadow darken the sun during the solar eclipse.

A limited number of solar glasses will be provided.

<https://www.clevelandmetroparks.com>

Geauga County/Park District—Nassau Observatory

10610 Clay Street, Montville Township

Aug. 19: Nassau Observation Station Grand Opening, 9 a.m. to 5 p.m.

Aug. 21: Astronomy, Nature's Not to be Missed (Eclipse Viewing),
Noon to 4 p.m.

Try out several methods of viewing the sun safely, model the eclipse and try hands-on activities. Maximum eclipse around 2:30 p.m.

<https://www.geaugaparkdistrict.org/parks/observatorypark.shtml>

Great Lakes Science Center (GLSC), NASA Visitor Center

601 Erieside Ave, Cleveland

Solar Eclipse Weekend: Aug. 19 through Aug. 21 (hours vary)

Aug. 21: 1 to 4 p.m.; peak viewing 2:30 p.m.

(Facility is open from 10 a.m. to 5 p.m.)

In collaboration with NASA Glenn, GLSC will be celebrating the solar eclipse with a weekend of hands-on activities, special demonstrations, simulcast eclipse coverage from around the country on NASA TV and an outdoor sun salutations yoga session. Guests can watch the eclipse from the garage lawn.

<http://greatscience.com>

RETIRED WOMEN'S LUNCHEON

The next luncheon is Thursday, Aug. 17, at 1 p.m. at Don's Pomeroy House, 13664 Pearl Road, Strongsville.

Please reserve your place with Gerry Ziemba at goto64gerry@yahoo.com or 330-273-4850.

BSA LUNCH AND LEARN

The next Business Services Assessment (BSA) Lunch and Learn session is Aug. 31, noon to 1 p.m., in the Small Dining Room, building 15. Glenn's Chief Information Officer Sean Gallagher and staff will discuss the IT decisions on Workstations, Data Centers and Governance. No RSVP is required—just grab your lunch and pull up a chair.

POC: Aimee Berquist, 3-3909

SEPT. OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct an audible siren test focusing on the "tornado" tone on Saturday, Sept. 2, at Lewis Field. An outdoor "voice" test will be conducted at building 15 on Wednesday, Sept. 6.

POC: Allen Turner, 3-6826

FARMERS MARKET DATES

Mark your calendar for Tuesday, Aug. 29; and Tuesday, Sept. 12, for Glenn's 2017 Summer Farmers Market. A variety of vendors will offer fresh produce, homemade goods and more. Markets take place at the Picnic Grounds from 11 a.m. to 1:30 p.m.

POC: Gabby Albrigo, 3-6313

IFPTE LOCAL 28, LESA MEETING

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



GRC-2017-CN-00044

Photo by Michael Bilka, UND

The ANCF at its new location with the UND students and Glenn staff.



GRC-2017-C-02270

Photo by Bridget Caswell

Lenny Smith, T-FOME, inside the APPL with the smaller DART system, at 4 feet long with a 14 inch diameter.

ANCF Leaves to Make Room for DART **Building on the Future of Engine Noise Reduction**

Glenn recently shut down the Advanced Noise Control Fan (ANCF), one of three acoustic test rigs supporting NASA's quieter, fuel-efficient aircraft research, and transferred it to the University of Notre Dame's Turbomachinery Lab (UND/TL). It has been replaced with a higher technology readiness level (TRL) capability that exists with a new test rig called the DGEN380 Aeropropulsion Research Turbofan (DART).

The 20-foot-tall by 4-foot-diameter ANCF, with its unique rotating rake measurement system, operated in the Aero-Acoustic Propulsion Laboratory (AAPL) over the past 20 years. It contributed to the advancement of multiple noise reduction and measurement technologies.

The UND/TL will now operate the ANCF for 5 years, under the terms of a Space Act Agreement. NASA experts will transfer the fundamental skills for ANCF operations, and UND graduate students may have an opportunity to return to Glenn as interns to advance NASA-focused research to a higher TRL.

Succeeding the ANCF, the DGEN380 turbofan engine is the primary component of the DART, a complete system capability. It will be used to develop noise reduction and engine control technologies, and other technical disciplines, suitable for larger, modern turbofan engines used by commercial airliners.

Unlike the ANCF, the DART is mobile, enabling testing at multiple facilities: AAPL, outdoor sites and wind tunnels. The NASA team installed a fuel supply, and modified an existing box truck, to accommodate the engine control bench provided by the vendor Price Induction.

To learn more about the AAPL, visit: <https://facilities.grc.nasa.gov/aapl>

By S. Jenise Veris and Daniel Sutliff

Emergency and Inclement Weather Lines

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

Connect With Glenn

