National Aeronautics and Space Administration



AeroSpace FRONTIERS

VOLUME 22 • ISSUE 6 • JUNE 2020

Celebrating Earth Day's 50th! Page 4

Glenn-Industry Fight COVID-19 Page 5

Glenn Joins "At Home" Science Festival Page 8

Thruster Withstands Extreme Environments Pages 2–3



Safely Returning to On-Site Work

As agency and center leadership develop return to on-site work plans to accomplish our mission critical priorities, I want to assure you the health and safety of our workforce will continue to be my top priority. As I shared during our virtual town hall last month, the plan will be flexible and informed by agency guidance and state and local conditions. Our goal is to create the safest environment possible while methodically and gradually transitioning our workforce back on-site.

Please continue to monitor Today@ Glenn, the NASA People website and communicate with your supervisor for the latest information.

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 in the interest of the Glenn workforce, retirees, government officials, business leaders and the general public.

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

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

Assistant Editor: S. Jenise Veris, ATS

Design: Rhys Sampson, ATS

Managing Editor: Kelly R. DiFrancesco

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

Glenn Prepares Powerful Thruster for Demonstration Mission to Asteroid

Through a series of performance and environmental tests, Glenn engineers have proven that NASA's Evolutionary Xenon Thruster—Commercial (NEXT–C) could withstand the extreme launch vibrations and temperatures of spaceflight.

NEXT-C is a powerful next-generation solar electric propulsion system that could propel future long-duration science missions. Glenn developed the technology, and Aerojet Rocketdyne along with subcontractor ZIN Technologies, designed and built the flight hardware.

Prior to moving into the Stage 4 Response Framework in March, the team put the thruster through vibration, thermal vacuum and performance tests in Glenn's Vacuum Facility 6 (VF–6) as well as the Structural Dynamics Laboratory. They then integrated it with its power processing unit, which had also undergone similar unit-level testing both at Glenn and off-site.

"The NEXT-C technology has been in development for many years, and the team is very excited to be able to deliver this hardware and finally see the technology fly on a mission," said Product Lead Engineer Rohit Shastry, Electric Propulsion Systems Branch. "The team has worked very hard to get to this point, but knowing that this technology will enable challenging NASA missions makes it all worth it."

On the Cover: Alyssa Brigeman, left, and Jim Bontempo, ZINT/ISS and Human Health Office, remove the NEXT–C flight power processing unit from Vacuum Facility 18 after successful testing. The work was performed in February.



NEXT-C is being prepared for the Double Asteroid Redirection Test (DART) Mission, which will launch next year. DART will be the first space mission to demonstrate asteroid deflection by kinetic impact, a technique that could prevent a hazardous asteroid from impacting Earth by changing the motion of the asteroid in space. NEXT-C's propulsion system will be tested on that mission, along with several other technologies.

When the propulsion system is successfully demonstrated on DART, NEXT–C will be considered on a variety of 10- to 15-year-long, uncrewed missions. These missions could include going to other asteroids, comets or planets such as Venus.

The test campaign was successfully completed in January. The NEXT–C team is now preparing to formally accept the flight hardware and deliver it to the John Hopkins Applied Physics Laboratory for integration onto the DART spacecraft.



GRC-2020-C-00741 Senior Facility Operator John Lauerhahs monitors the health of VF–6 during testing of the DART flight thruster.



GRC-2020-C-00805

Photos by Bridget Caswell

Thruster Lead Engineer George Soulas prepares to check plasma probe alignment with the DART flight thruster.

Earth Day: Protecting the Earth Today, for Tomorrow

April 22 marked the 50th anniversary of the first Earth Day, which has become a worldwide event to celebrate, honor and protect the planet. NASA Glenn joined the agency in virtual activities throughout the month.

As part of the celebration, Glenn's Sustainability Outreach Team shared various Earth-friendly links via the Glenn Research Center Sustainability webpage, https://www.grc.nasa.gov/f/fe/sustainability, and on Today@Glenn each week in April leading up to the big day. The sites featured virtual tours, events and everyday actions that employees can take to help protect the planet.

On Earth Day, Glenn's Sustainability Officer Dr. Joel Kearns, director of Glenn's Facilities, Test and Manufacturing Directorate, provided a virtual Earth Day presentation. He shared how he has gained a better perspective on Earth Day activities and the importance of each individual becoming a better steward of the environment.

"It [Earth Day] is about what we as citizens can do every day of the year to make Earth—the only planet we know of, today, that can support life and our only home—healthier every day and into the future."

Kearns provided examples of historical events, legislation and current initiatives across five decades that affected change and brought a greater focus on environmental issues. He also included an overview of NASA sustainability goals and Glenn's 10-year Sustainability Plan for protecting the Earth.

The presentation concluded with a challenge to employees to expand their knowledge and search for ideas on how to reduce their environmental footprint starting from the comfort of their homes. He also promoted participation in additional activities available via NASA's **#EarthDayAtHome** and https://nasa.gov/content/earthday-2020@NASAEarth

By S. Jenise Veris

EPA Awards Environmental Stewardship

The Ohio Environmental Protection Agency (EPA) has awarded NASA Glenn the Silver Level Award in the Encouraging Environmental Excellence (E3) Program.

This award recognizes outstanding environmental stewardship efforts pursued in:

- · Constructing and operating LEED-certified buildings
- Reducing energy use and water consumption for institutional buildings
- Maintaining a significant recycling rate and recycling hundreds
 of tons of material
- Implementing a well-developed environmental purchasing program.

The E3 award also took into consideration Glenn's progress in environmental initiatives. These include management commitment; employee involvement (outreach and awareness events); innovation (Glenn's research contributions toward the Advanced Air Vehicles Program and harmful algal bloom monitoring); and overall continuous improvement.

Dr. Joel Kearns, Glenn's Center Sustainability Officer, said center employees—especially all the members of Glenn's crossorganizational Sustainability Working Group—have worked hard to meet NASA's sustainability goals and achievements.

The Glenn Sustainability Working Group would like to say thank you to all Glenn employees. "Because of the work you do, you make a positive impact on the environment and allow Glenn to be recognized for this effort!"

Welcome 2020 Summer Interns and Faculty!

This summer's Lewis' Educational and Research Collaborative Internship Project (LERCIP) interns come aboard on June 15, and work through Aug. 21. The NASA Glenn Faculty Fellowship Program; NASA (Graduate) Fellowships Program; NASA Internship Project; the Vermont, Michigan, Indiana, Idaho, Oregon and Arizona Space Grant Consortia; and the Established Program to Stimulate Competitive Research (EPSCoR) all welcomed summer staff on June 8.

Summer interns and faculty will work virtually this year.

Glenn-Industry Team to Advance Device for COVID-19 Sterilization

Commercial technology developed in Northeast Ohio to keep frontline emergency medical technicians (EMTs) safe is now joining the fight against the coronavirus (COVID-19).

Through NASA's technology transfer efforts in 2015, NASA Glenn partnered with Emergency Products + Research (EP+R) based in Kent, Ohio, to guide the development and production of a small, portable and economical device. The fogging system, called AMBUstat, is currently used to reliably clean spaces such as ambulances, police cars and other areas. A disinfectant liquid is aerosolized into tiny droplets, which when land on surfaces, kill bacteria and viruses in less than an hour and at a fraction of the cost of other systems.

Dr. Sharon Miller, Environmental Effects and Coatings Branch, consulted with EP+R on technical challenges they were experiencing in the design and application of their technology.



GRC-2020-C-01637

Official White House Photo: Shealah Craighead

NASA Administrator Jim Bridenstine, right, briefs President Donald Trump on NASA research related to COVID-19, including Glenn's work with AMBUstat. Many of the employees are former EMTs with field experience but do not have engineering or research backgrounds. With Glenn's assistance, the company developed an effective product called AMBUstat, which it has been selling for several years.

In response to the COVID-19 pandemic, EP+R updated their design, and received additional support from NASA. Dr. Marit Meyer, Low-Gravity Exploration Technology Branch, is leading research to maximize the effectiveness of the next-generation AMBUstat device, dubbed "G2."

Meyer said the existing product works on surfaces, after they are cleaned and wiped down, by depositing droplets of rapidly evaporating sterilant. The new product that is under design aims to also kill bioaerosols (airborne pathogens), like the coronavirus, which may be attached to particles that float in the air.

"If you were able to disperse the sterilant and have the right sized droplets in your fog, then you could kill these airborne pathogens," said Meyer. "Another objective is to keep the cost really low so they could make the technology available to underserved communities and entities, such as school districts, that can't afford to spend a lot of money on new technologies."

Meyer said Glenn is contributing its expertise and lab testing capability to help EP+R understand the droplet size distributions at different flow settings. The research is also examining the dispersion of the liquid sterilant into spaces such as the crevices in a police car, versus larger ones like classrooms or dining areas. Another goal is to minimize the amount of sterilant the device uses to reduce costs without sacrificing effectiveness.

The Worm Is Back!

The retro red NASA design that graced agency clothing from the 1970s to the early 1990s is back to mark the next era of human space exploration. This design was featured on the side of SpaceX's Falcon 9 when the agency launched astronauts Douglas Hurley and Robert Behnken to the International Space Station as part of NASA's Commercial Crew Program. NASA still is assessing how and where the NASA "worm" will be used beyond the Demo-2 test flight. The "meatball" remains NASA's primary insignia.



GRC-2020-CN-00019 Photo: S The SpaceX Falcon 9 rocket displays NASA's worm logo.

Glenn Mourns Annie Glenn

Annie Glenn, beloved wife of former astronaut and U.S. Senator John Glenn, died on May 19 at the age of 100. Nearly inseparable throughout their 73-year marriage, Annie accompanied John during his multiple visits to the center, where she warmly greeted employees and participated in tours and other activities. Most memorable of these visits was the May 1999 center renaming ceremony and parade, pictured, in John's honor. Additionally, during the March 2012 celebration of John's 50th anniversary of becoming the first American to orbit Earth, Annie received a standing ovation. Glenn Research Center will miss Annie. To read more about Annie's life and accomplishments, visit http://johnglennhome.org/about/annie-glenn/.



GRC-1999-C-01164

Photo by Christopher Lynch

Employees Earn HEO HErO Awards



NASA's Human Exploration and Operations Mission Directorate recently recognized four Glenn employees with HEO HErO awards. These awards acknowledge an employee's outstanding contributions or achievements towards helping NASA

and the Human Exploration and Operations (HEO) program move forward towards putting the first woman and next man on the lunar surface of the Moon by 2024.

Kathryn Oriti, European Service Module Integration Office, led a Glenn team through comprehensive reviews of Orion's European Service Module with the European Space Agency, Airbus and Lockheed Martin. **Elliot Schmidt**, Structural Mechanics Branch, led the stress analysis team tasked with making sure Orion is prepared to safely fly. **L. Nicole Smith**, Exploration Systems Office, managed the operations and logistics of bringing Orion to Plum Brook Station and led the successful completion of Artemis I testing. **Jim Withrow**, European Service Module Integration Office, managed the Propulsion Qualification Module tests for Orion and led the White Sands Test Facility support test team.



Oriti



Schmidt



Smith



Withrow

IEEE Award

The national Institute of Electrical and Electronics Engineers (IEEE) Board of Directors selected Dr. Philip Neudeck the winner of the 2019 IEEE-USA Harry Diamond Memorial Award that honors individuals in U.S. Government service for their distinguished technical contributions in the field of electrotechnology. Neudeck was recognized for his pioneering work in developing silicon carbide (SiC) semiconductor electronics.



Dr. Neudeck



PROMOTIONS

L. Nicole Smith has been selected chief of the Exploration Systems Project Office within the Human Exploration and Space Operations Project Office, Space Flight Systems Directorate. Smith most recently served as project manager for Orion environmental testing at Plum Brook Station.

Smith

RETIREMENTS



Gayle C. Thiessen, Data and Systems Branch, Testing Division, retired May 29, 2020, with 36 years of service.

Dr. Louis A. Povinelli, senior scientist, Aerospace Propulsion in the Propulsion Division, Research and Engineering Directorate, retired May 1, 2020, with 60 years of service.



Dr. Povinelli

MORE THAN A MEMORY

Vernon L. Mays, 87, a 1982 retiree with 30 years of NASA service, died April 28. Mays was a U.S. Army veteran and a 1958 Lewis Apprentice Program graduate certified as a stationary engineer to operate/troubleshoot industrial, energy-producing machinery. He initially worked on drive motors in the 10-by-10 Operations Section before transferring to the Materials and Rockets Branch in the Facilities Operations Division. Mays retired from the Basic Materials Laboratory where he operated the Dynamitron accelerator for the Cyclotron Facility.



Mays

OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct a mass notification "voice" test at bldg. 3 on Wednesday, July 1 at Lewis Field. They will conduct an audible siren test on the "Area Evacuation" tone on Saturday, July 4.

POC: Allen Turner, 3-6826

AEROSPACE TOASTMASTERS MEET

Improve communications and leadership skills through Aerospace Toastmasters. The group meets on Microsoft Teams on Thursdays from 12:05 p.m. to 12:50 p.m. Contact john.wang-1@nasa.gov, extension 3-3613, for more information. https:// aerospace.toastmastersclubs.org/.

TELEMEDICINE CONSULTATIONS

Employees can have confidence that they are on the right path to better health outcomes with Glenn's Telemedicine Consult Service. Glenn's Medical Services Clinic staff is available to provide telephonic medical consultations for all Glenn employees during the current center telework stage. Contact their staff for a consult today by sending an email to grcmedicalservices@mail.nasa.org.

Stay tuned to Today@Glenn for updates on these activities.

Deadline for the next calendar section is **June 17, noon.** News and feature stories require additional time.



Dr. James Sutter, 63, a 2015 retiree with 31 years of NASA service, died April 12. Sutter was a highly accomplished researcher in advanced propulsion composite materials. He served primarily in the Ceramics and Polymers Branch working on erosion-resistant composite coatings and high-temperature polymer matrix composites. Sutter earned several significant NASA awards, including a 1998 Exceptional Service Medal; 2010 Space Flight Awareness Award; 2014 Silver Snoopy; and 2013 Society for the Advancement of Material and Process Engineering fellow distinction.

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.

Glenn Joins Big "At Home" Science Celebration!



GRC-2020-CN-00018

Dr. Jamesa Stokes talks about her journey to becoming a material scientist at Glenn and encourages others to pursue STEM careers.

The 2020 COSI (Center of Science and Industry) Science Festival went digital this year with fun and engaging virtual experiences, May 6 to 9. Several NASA Glenn researchers and scientists participated in the festival through COSI's Facebook Live app.

Additionally, NASA Administrator Jim Bridenstine joined COSI CEO Dr. Frederic Bertley in the live videostream conversation, "Get Ready–We're Going to the Moon and Mars!" Center Director Dr. Pérez-Davis participated in the event by sharing Glenn contributions. She introduced astronaut Doug Wheelock, who talked about life as a NASA astronaut and what the future of space travel may look like.



Center Director Dr. Pérez-Davis and astronaut Wheelock talk with Dr. Bertley during the virtual event.

Emergency and Inclement Weather Lines Lewis Field: 216–433–9328 (WEAT) Plum Brook Station: 419–621–3333

Connect With Glenn

