



AeroSpace FRONTIERS

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Demonstrating Resilience

During this uncertain time, I am proud of the resilience our workforce has demonstrated in executing our mission. Whether in adapting to the new virtual telework environment, continuing to work on-site for mission-critical duties or answering the agency's COVID-19 call for innovative ideas, Glenn's workforce is responding! Most importantly, I ask you to be resilient when it comes to your own personal health and safety. As our Administrator has said, "our people are our most mission-essential asset. Protecting our workforce is, and will continue to be, our top priority."

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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GRC-2020-C-09935

Photos by Bridget Caswell

The Volatiles Investigating Polar Exploration Rover, or VIPER, in SLOPE.

NASA's New Moon Rover Tested in Lunar Operations Lab

Glenn recently tested an engineering model of the Volatiles Investigating Polar Exploration Rover, or VIPER, in the Simulated Lunar Operations Laboratory (SLOPE) at Lewis Field. About the size of a golf cart, VIPER is a mobile robot that will roam around the Moon's south pole looking for water ice in the region. This is the same pole where the first woman and next man will land in 2024 under the Artemis program.



GRC-2020C-09926

Photo by Bridget Caswell

On the Cover: Glenn's Erin Rezich, front, prepares soil in the SLOPE Lab's tilt bed for a study to determine what angle the rover could no longer propel itself forward. NASA Johnson team members wait in the background.



GRC-2020-C-09915

Glenn's Stephen Gerdts, front left with camera; Erin Rezich, far back center; and Fransua Thomas, far right; and Johnson team members prepare for testing.

The large, adjustable soil bin contains lunar simulant and allows engineers to mimic the Moon's terrain. Engineers from NASA's Johnson Space Center in Houston, where the rover was designed and built, joined the Glenn team to complete the tests. Test data will be used to evaluate the traction of the vehicle and wheels, determine the power requirements for a variety of maneuvers and compare methods of traversing steep slopes. Respirators are worn by researchers to protect against the airborne silica that is present during testing.

VIPER is a collaboration within and beyond the agency. NASA's Ames Research Center in Moffett Field, California is managing the project, leading the mission's science, systems engineering, real-time rover surface operations and software. Ames, NASA's Kennedy Space Center in Florida and commercial partner, Honeybee Robotics in California, are providing the rover's instruments. NASA's Commercial Lunar Payload Services program will provide the spacecraft, lander and launch vehicle that will deliver VIPER to the surface of the Moon.



GRC-2020-C-09956

Glenn's Andrew Ring, far left, Johnson's Ivan Spain, center, and Ames' Arno Rogg remotely operate cameras to track performance.

Stirling Converter Sets 14-Year Continuous Operation Milestone

Stirling converters can teach us a lesson in the value of perseverance. On March 9, Glenn's Technology Demonstration Converter (TDC) #13, a free-piston Stirling power converter, achieved a milestone of 14 years of maintenance-free operation in the Stirling Research Laboratory in building 301. This technology is proving our capability to power spacecraft on future longer-duration scientific missions.

The converter previously set the record for the longest maintenance-free operation of a mechanical heat engine, when it reached 110,000 hours of operation in May 2018.



Photos by Bridget Caswell
GRC-2020-C-01395

Wong, left, and Scott Wilson, Dynamic Power Converter technical lead, inspect TDC #13.

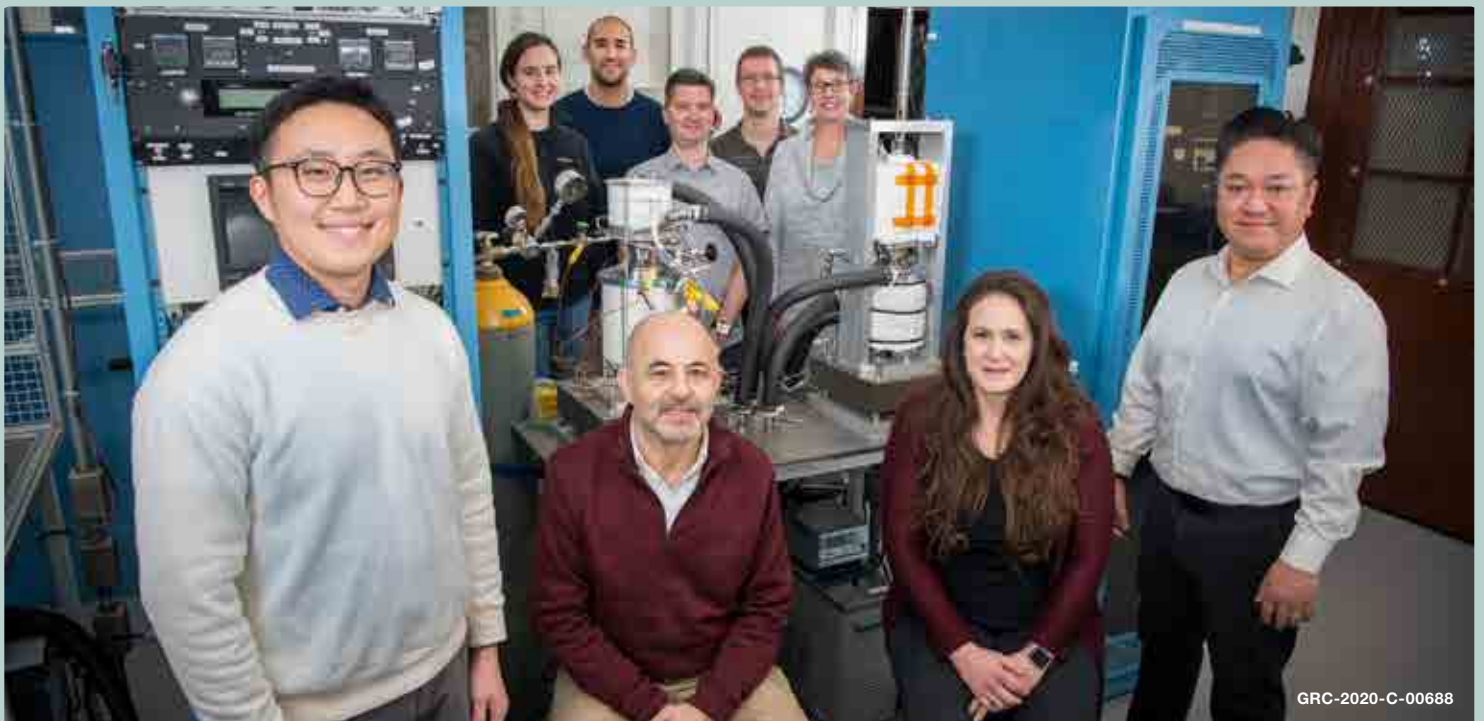
“This new milestone is particularly significant,” said Wayne Wong, Thermal Energy Conversion Branch chief. “Previous flight projects determined the mission duration requirement for Radioisotope Power Systems (RPS) is 14 years, particularly for outer planetary missions with long cruise times.”

Wong explained that technological innovations such as noncontact seals and bearings enable maintenance-free moving mechanical devices that exhibit no wear. The RPS Program develops free-piston Stirling technology as a much higher efficiency alternative to thermoelectrics.

The TDC #13 is the oldest of several converters with 10 to 14 years of operation on tests that have shown no signs of degradation. This unit began operation at Glenn in 2002 after it was delivered by Stirling Technology Company.

The current Dynamic RPS Project has three contracts to develop next-generation power converters. The AMSC has one of the contracts and is developing the Flexure Isotope Stirling Converter (FISC), which is based on the TDC design with changes to improve robustness, reliability and performance. The FISC will undergo assembly and will be delivered to Glenn this year, where it will undergo rigorous testing to ensure that it can meet the demands of future RPS.

By Doreen B. Zudell



GRC-2020-C-00688

The Stirling Research Lab Team in front of the TDC #13, left to right: Donguk Max Yang, Nissim Lugasy, Gina Dugala and Wong; back: Natasha Jackson, Sal Oriti, Scott Wilson, Nicholas Schifer and Mary Ellen Roth.

Employees Keep Center Operating Safely

While the majority of employees are settled in their home offices, a contingent of workers pass through Plum Brook Station and Lewis Field gates each day to ensure equipment and facilities are safe and operating.

The following areas are considered “excepted work” during this mandatory telework period:

- Security
- Logistics (mail, fuels, shipping and receiving)
- Janitorial and Grounds Crew (sanitizing and maintenance)
- Central Processing Operations
- Emergency Response and Critical Repairs
- IT support (end user assistance supporting telework and data center)
- Labs—placing labs into a safe and secure state including performing critical maintenance
- Facilities—placing facilities into a safe and secure state including performing critical maintenance
- International Space Station Telescience Support Center (limited staff)
- Onboarding new employees
- N95 Mask Sterilization Systems

Associate Director Larry Sivic said a limited number of employees are onsite on a daily basis.

“I’m proud of the employees who are working to ensure the protection of life and property at both Lewis Field and Plum Brook Station,” said Sivic. “Their dedication will better ensure a smooth transition when we all return.”



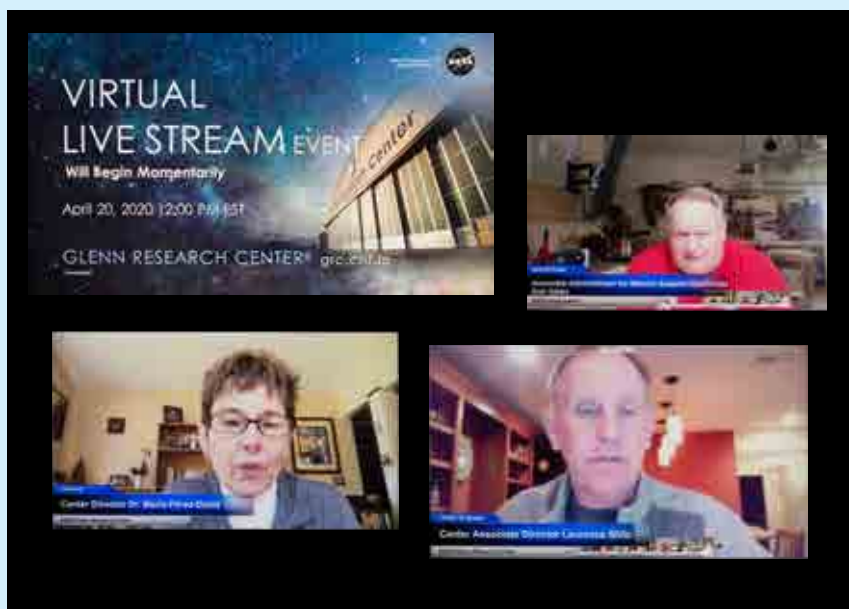
GRC-2020-C-01454

Photo by Marvin Smith

During a Virtual Town Hall, Center Director Dr. Marla Pérez-Davis recognized security personnel who are among the employees who keep our center safe and secure. Left to right: Sgt. Brett Bonifield-Gast, Rachel Pilar, Mike McDonald, Sgt. Jarrod Gentile, Lt. Nick Brill and Andrew Knepp.

Virtual Town Halls Connect Glenn Family

To ensure timely communications with the workforce during mandatory telework, Center Director Dr. Marla Pérez-Davis and Associate Director Larry Sivic are hosting weekly virtual town hall meetings. The livestream broadcasts provide center updates on the NASA Framework relating to the coronavirus situation and enable employees to ask questions using the Conferences i/o Audio Response System, www.grc.cnf.io. Glenn’s senior leaders serve as subject matter experts, answering questions on topics ranging from mission-essential activities, excused leave and telework tools. In early April, the meetings expanded to add brief updates by agency-level leaders.



GRC-2020-C-01446, GRC-2020-C-01448, GRC-2020-C-01449, GRC-2020-C-01450

Photos by Marvin Smith

NASA Celebrates Apollo: 50th Anniversary of Apollo 13

April 11 marked the 50th anniversary of the launch of the Apollo 13 mission. Just 2 days later, Commander Jim Lovell uttered the phrase “Houston, we’ve had a problem.” An explosion crippled the primary spacecraft, but Lovell and fellow crewmembers Fred Haise and Jack Swigert returned safely to Earth thanks to the determined work of the ground crew at Mission Control. Although the mission never made it to the lunar surface, NASA deemed it a “successful failure.” Click [here](https://www.nasa.gov/feature/glenn/2020/history/nasa-lewis-aided-apollo-13-investigation) to see how NASA Glenn aided in the accident investigation.

<https://www.nasa.gov/feature/glenn/2020/history/nasa-lewis-aided-apollo-13-investigation>



KSC-70PC-0130

Photo by NASA

Left to right: Apollo 13 crewmembers Fred Haise, Jim Lovell and Jack Swigert emerge safely from the recovery helicopter onboard the aircraft carrier USS Iwo Jima on April 17, 1970.

Glenn and WPAFB Strengthen Systems Engineering

Nancy R. Hall and William A. Fabanich recently completed the Air Force Institute of Technology (AFIT) Systems Engineering (SE) program. Their success strengthens a bridge between Glenn and Wright-Patterson Air Force Base (WPAFB) and promotes advanced training to maintain a world-class system engineering capability for future complex NASA missions.



GRC-2020-C-00533

Photo by Marvin Smith

Left to right: AFIT's Cleveland liaison Al Thal, Hall, Fabanich, Lt. Col. Cox, Dr. Pérez-Davis and Susan Whitfield, Glenn's Human Resources director, at the certificate presentation.

“We previously worked with Wright-Patterson to establish the pilot for Glenn’s Rocket University, which provided Glenn’s early careerists hands-on experience to see a project through its full lifecycle,” explained Nola Bland, Glenn’s learning officer. “Reviving our partnership provided an opportunity to build on our competencies in systems engineering. The partnership was a collaboration with senior leaders from Code L and Code T, inspired by Center Director Dr. Marla Pérez-Davis, to adapt AFIT’s SE curriculum to reflect state of the field of systems engineering relevant to NASA’s needs,” she added.

Lieutenant Colonel Amy M. Cox, assistant professor in AFIT’s Department of Systems Engineering and Management, served as the participants primary point of contact throughout the program.

The AFIT’s SE program is a graduate-level engineering program that can be taken online. The primary targeted audiences are Glenn employees in technical fields with high potential of becoming chief engineers, group-level senior engineers and lead system engineers.

By S. Jenise Veris

PROMOTIONS

Robert F. LaSalvia has been selected the Strategic Partnership Manager, Office of STEM Engagement at NASA Headquarters. LaSalvia will remain physically located at NASA Glenn, where he most recently served as chief of Glenn's Office of STEM Engagement.



LaSalvia



Bland

Nola L. Bland has been selected to the position of Chief Learning Officer in Glenn's Office of Human Resources (OHR). She is responsible for the management, coordination and direction of comprehensive training and employee development programs. She previously served as a Human Resources Specialist for Development in OHR.

MORE THAN A MEMORY

Franklin "Frank" Vergilii, 80, a 2010 retiree with 22 years of NASA service, died April 3. A chemical engineer, Vergilii joined the Photovoltaic Power Module Division in 1988 working on the Orbital Replacement Unit and the Sequential Shunt Unit. Vergilii joined the Space Experiments Division in 1994, where he contributed to a number of microgravity experiments conducted on the space shuttle and the International Space Station. He was project manager for the Turbulent Gas-Jet Diffusion Flame and the Microgravity Smoldering Combustion experiments.



Vergilii

IT Training Due By May 31

The FY2020 Cybersecurity and Sensitive Unclassified Information Awareness course (ITS-020-001) in SATERN must be completed by May 31, 2020, to retain access to the NASA network. This includes those on extended leaves of absence. To access SATERN, go to <https://satern.nasa.gov/> (or type SATERN in the Wing Transporter). Go to "My Learning Assignments." A home computer can be used to access SATERN by entering your Agency User ID and Launchpad password. You can obtain a Launchpad password reset if needed. The Launchpad password is not the NDC password.

OUTDOOR SIREN TESTING

The Emergency Management Office staff will conduct a mass notification "voice" test at buildings 100 and 302 on Wednesday, June 3, at Lewis Field. They will conduct an audible siren test on the "HAZMAT" tone on Saturday, June 6.

POC: Allen Turner, 3-6826

IFPTE LOCAL 28, LESA MEETING

LESA will hold its next membership meeting, Wednesday, June 3, noon, in the Glenn Employee Center's Small Dining Room.

GSEL TELEWORKING RESOURCES

The Glenn Science and Engineering Library (GSEL) is just a click away! To accompany in-house resources on the homepage, <https://itidportal.grc.nasa.gov/Library.aspx>, library staff has compiled a list of resources to use while teleworking. Reach out if you need assistance with anything! GRC-library@mail.nasa.gov or GRC-learningcenter@mail.nasa.gov.

POC: Robin Pertz, 3-5776

VIRTUAL FITNESS

The Fitness Center is open—virtually! The staff has set up channels on MicroSoft Teams to serve the greater Glenn community. They provide live Teams classes, remote personal training, workout programs and general wellness advice. All are welcome to join. Search for Bob Laws, Heather Mueller or Kayla Kazanowski on Teams.

Visit <https://www.grc.nasa.gov/smad/fitness/> for details

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

Deadline for the next calendar section is **May 20, noon**. News and feature stories require additional time.

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Read AeroSpace Frontiers online at <http://www.nasa.gov/centers/glenn/news/AF/index.html>.



Hubble Celebrates Three Decades of Discovery



Astronauts perform one of several extravehicular activities (EVA) during Hubble's first service mission, STS-61/Endeavour, in the shuttle's cargo bay.

April 24 marked the 30th anniversary of the launch of the Hubble Space Telescope, which has delivered unprecedented views of the solar system and generated key information on the origins of the universe.

At critical times throughout Hubble's history, NASA Lewis (now Glenn) experts played key roles in ensuring the telescope's mission success and longevity.

Shortly after Hubble was deployed in 1990, scientists discovered that the new telescope was producing blurry images and also had a thermal jitter, or shake problem. The first servicing mission (SM-1) in 1993, explored the use of thermal-shield-covered solar arrays to eliminate the thermal jitter.

In 1992, NASA turned to Glenn researchers in the Electro-Physics Branch to perform environmental testing of coated and uncoated thermal shields. The Hubble Thermal Shield Durability Evaluation Team included: Kim de Groh, Joyce Dever, Sharon Miller, Edward Sechkar, Curtis Stidham, Thomas Stueber, Deborah Waters and James Gaier, led by Branch Chief Bruce Banks. The researchers used Glenn's specialized vacuum chambers to perform extensive thermal shield testing to simulate the harsh conditions Hubble would experience over a 5-year period. The team received a NASA Group Achievement Award in January 1994 for their efforts, and subsequently, contributed to each of four follow-up servicing missions (SM-2, SM-3A, SM-3B and SM-4) between 1997 and 2009.

In January 2019, NASA estimated Hubble's reliability to exceed 80 percent through 2025. This will secure a legacy of excellence and allow overlap of scientific operations with its imminent successor, the James Webb Space Telescope.

A more detailed account of Glenn contributions to Hubble's service missions is available at <https://www.nasa.gov/glenn/feature/2020/lewis-experts-supported-a-critical-repair-on-hubble-in-the-1990s>.

By S. Jenise Veris

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Plum Brook Station: 419-621-3333

Connect With Glenn

