



# AeroSpace FRONTIERS

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DIRECTOR'S  
SAFETY CORNER

## Staying Vigilant

The recent downward trend in new COVID-19 cases provides much-needed good news on the pandemic. However, we need to remember cases were at an extremely high level and still remain too high. We must stay vigilant and avoid "COVID fatigue." The experts tell us now is not the time to let our guard down and to continue to wear our masks, wash our hands, practice social distancing, avoid gatherings, and to not come on-site if feeling ill. I am extremely proud we've had no known on-site transmissions to date, thanks to your support. We will get through this together.

Your health and safety remain my top priority.

## AeroSpace Frontiers

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Submit short articles and calendar items to the editor at [doreen.b.zudell@nasa.gov](mailto:doreen.b.zudell@nasa.gov).

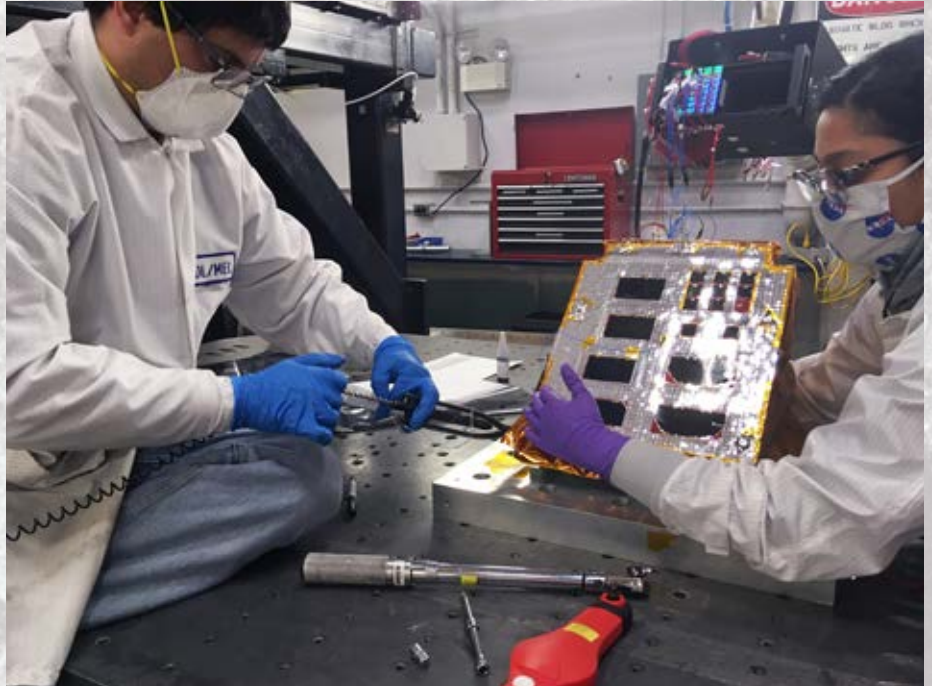
Editor: **Doreen B. Zudell**, ATS,  
216-433-5317

Design: **Rhys Sampson**, ATS

Managing Editor: **Kelly R. DiFrancesco**

Circulation: **Angela Williams**, ATS,  
216-433-8921

# New Solar Experiment Ready To Go to the Moon



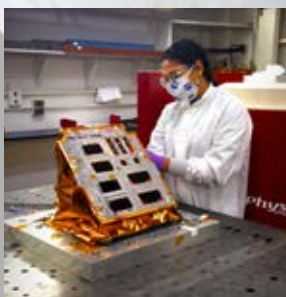
GRC-2021-C-00180

Photo by Amy Stalker

*Spyros Efpraxias, research lab mechanic, left, and Greeta Thaikattil, lead thermal engineer, install the PILS payload on the vibration table for testing.*

NASA is one step closer to understanding the solar power challenges and opportunities on the Moon's surface after completing the build and readiness review of the Photovoltaic Investigation on the Lunar Surface (PILS) experiment. The agency overcame multiple engineering challenges to prepare the experiment for integration with a commercial lander for a ride to the Moon as part of NASA's Commercial Lunar Payload Services (CLPS) initiative.

"NASA's last opportunity to use solar power on the surface of the Moon was 50 years ago during Apollo," said Matt DeMinico, PILS project manager, Space Science Project Office. "It's exciting to send a first-of-its-kind experiment, like PILS, to the lunar surface to prove state-of-the-art space solar cells and high-voltage solar arrays for future exploration missions, and we're ready to begin the lander integration process with Astrobotic Technology."



### On the Cover:

*Greeta Thaikattil, lead thermal engineer, checks the installation of the PILS experiment on a vibration table prior to testing at Glenn.*

Photo by Amy Stalker  
GRC-2021-C-00179

Building an in-space experiment is difficult under any conditions, but the PILS team successfully completed the build and in-house testing under strict coronavirus safety precautions. Last March, Glenn, along with much of the agency, moved to mandatory telework in response to the ongoing pandemic to ensure the health and safety of its workforce, thus halting the PILS build and preflight testing.

In the months since, mission-critical work was slowly able to resume, allowing the PILS team to return to their laboratories and complete all remaining work. The team adjusted planned activities and tests to align with the necessary safety protocols and limited the number of members on-site.

“Working on-site while much of the center is still teleworking is a bit strange, mostly because it is much quieter than I am used to,” said Jeremiah McNatt, a PILS principal investigator, Photovoltaic and Electrochemical Systems Branch. “Luckily we were able to safely keep moving forward and kept the broader team updated on daily activities through video chats and virtual meetings.”

The PILS platform, while relatively small and lightweight, will provide a flight demonstration of multiple solar cell technologies

from multiple companies that could be used for future lunar missions. This solar charging experiment will help in the design of high-voltage solar arrays on the surface that may be used to power in situ resource utilization systems and other lunar surface assets.

The PILS experiment is targeted to fly later this year as one of 11 NASA payloads on an Astrobotic Peregrine lander. Astrobotic and Intuitive Machines were both selected to fly several NASA science investigations and technology demonstrations to the Moon this year. The delivery of these payloads is the first of many ahead of human return to the Moon, and are all part of the Artemis program. Ultimately, PILS will help establish baseline requirements and capabilities for future solar power generation systems for the Moon, and eventually, Mars.

“PILS is just the first step in better understanding the environment in which solar arrays and power systems will exist on the Moon as we work toward powering a sustainable, long-term human-lunar presence there,” said Tim Peshek, PILS co-principal investigator, Photovoltaic and Electrochemical Systems Branch.

By Jimi Russell



GRC-2021-C-00178

Photo by Norm Prokop

*PILS electronics and internal electrical connector that will attach the experiment to the Astrobotic Peregrine lander. The PILS solar experiment will help establish requirements and capabilities for future missions to the Moon and beyond.*

# Glenn's New High-Performance Building Nearly Complete

Construction on Glenn's Research Support Building (RSB), which began in November 2018, is 92% complete! Located adjacent to the Mission Integration Center, this high-performance building—optimized for environmental sustainability and energy efficiency—creates a campus center at Lewis Field.

RSB Project Manager Tim Wardlow, Project Management Branch, said the greatest challenge has been to manage the construction and financial impacts of two major work stoppages within a single contract performance period.

“Completing site work and paving activities within 3 months of returning to on-site work in the fall of 2020 was a major accomplishment, which included mitigation of unsuitable subsurface soils and solid waste material disposal,” Wardlow said.

Part of Glenn's Facility Master Plan, the RSB aligns with the agency's sustainability goals for energy-efficient, cost-saving buildings that will help reduce NASA's carbon footprint.

The RSB will be approximately 64,000 square feet in overall size and will house around 164 occupants. The building is being constructed on the site of the previously demolished Building 21. The two-story structure will consist of a public wing and an office wing. The public wing includes a new cafeteria, exchange store, and training rooms, as well as two rooms designed to support concurrent engineering. The creation of these areas will allow for the future demolition of Building 15. Visitors to the cafeteria dining spaces will enjoy panoramic views of the Lewis Field campus from a cantilevered structure—an extended deck reaching out to create a gateway to the central campus.

Construction completion is expected in April, with the building ready for occupancy in June.



GRC-2021-CN-00012

Photo by Frank Kaufhold



GRC-2021-CN-00013

Photo by Multivista



GRC-2021-CN-00014

Photo by Multivista

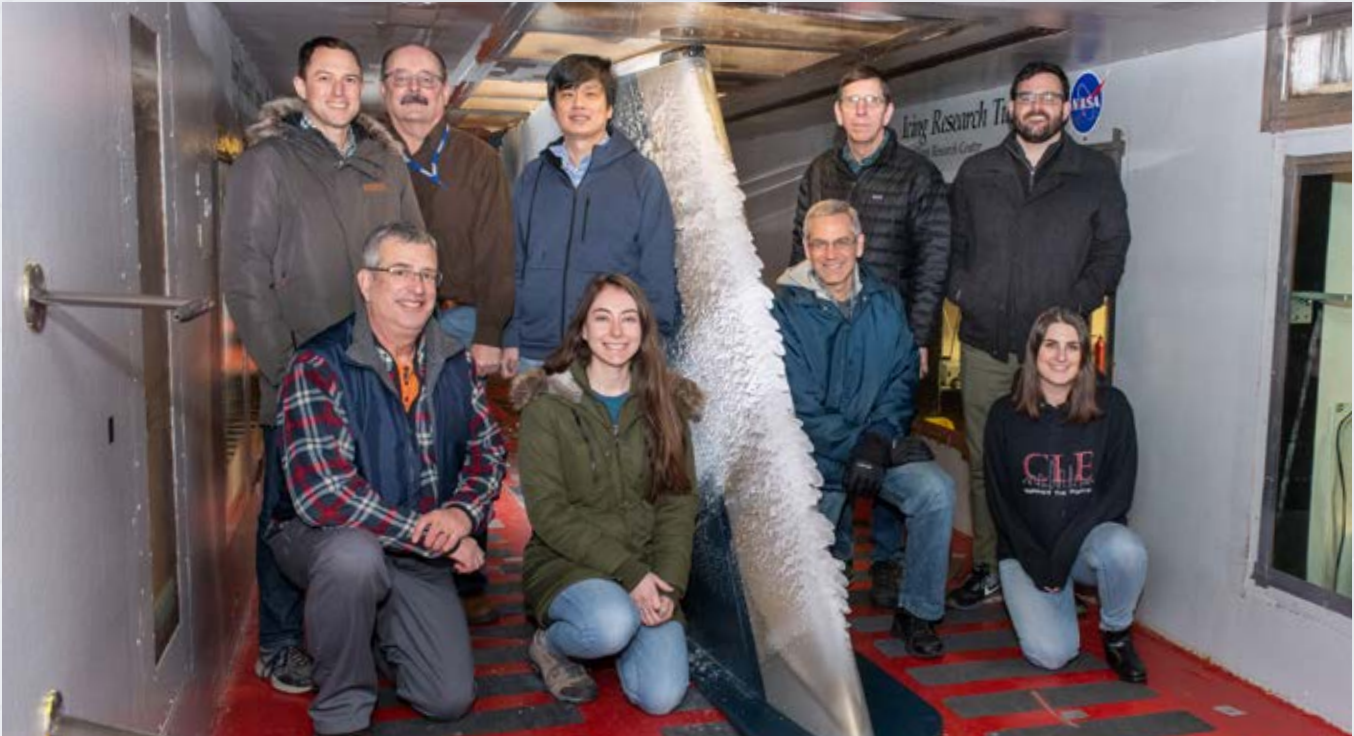
Top: Cafeteria serving area. Middle: Dining wing. Bottom: Open-space office area.

By Doreen Zudell

## Student Essay Contest Celebrates Glenn's 80th Anniversary



NASA Glenn is celebrating 80 years of pushing boundaries and breaking barriers! Students in grades 4 to 12 are invited to join the celebration by learning about NASA Glenn's missions and people. They then write an essay explaining how our exploration and discoveries inspire them and their career goals or may change the way we live and work in the future. Essay contest winners will receive an invitation to participate in a live virtual recognition event with NASA scientists and engineers and will include virtual tours of NASA Glenn facilities. Two winners from each grade band (grades 4 to 5, grades 6 to 8, and grades 9 to 12) will have their essays published on a NASA Glenn webpage. For more information, visit <https://go.nasa.gov/2NBwAuM>. Contest submissions are due March 31.



GRC-2020-C-01624

Photo by Quentin Schwinn

*Icing Branch members and others who participated in testing gather for a photo in February 2020. Left to right, standing: Dr. Brian Woodard (University of Illinois), Dr. Mark Potapczuk, Dr. Sam Lee, Dr. Mike Bragg (University of Illinois), and Christopher Porter. Front row, kneeling: Quentin Schwinn (Imaging Technology Center), Emma Wood (intern), Dr. Broeren, and Jordan Salkin (Imaging Technology Center).*

## Full-Scale Wing Model Test Advances Computational Icing Simulation Tool

In a crucial step toward improving flight safety, Glenn's icing researchers used a full-scale aircraft wing model to validate the next generation of GlennICE, NASA's Icing Computational Environment simulation tool.

Using a section of the wing called the NASA Common Research Model (CRM), Glenn researchers generated an experimental database of ice shapes to extend the validity of GlennICE. The data are also important in assessing how ground test facilities like the Icing Research Tunnel (IRT) can be used for evaluating large-scale aircraft components.

"This test was significant because the test article is both large and representative of a commercial transport wing, such as a Boeing 757 airplane [wing]," said Dr. Andy Broeren, Icing Branch. "In this test, it was important to maintain full-scale geometry to the largest extent possible."

The primary stakeholders in this work are NASA programs and industry partners interested in advancing experimental and computational tools to address in-flight icing issues for large transport airplanes. They share a common goal: to improve airplane efficiency while reducing harmful emissions and noise.

"It turns out that airplanes must sometimes be 'overdesigned' in order to account for in-flight icing performance margins," said Broeren. "As a result, airplanes do not operate as efficiently as possible, so they use more fuel, which can also translate to higher levels of carbon emissions and noise. We are trying to improve the accuracy of computational icing tools so that airplanes can operate as efficiently as possible while maintaining the safety levels that we currently enjoy."

This research is especially timely because NASA Glenn is working toward the official release of GlennICE. The experimental data will help support the validation effort that is critical for this computational tool to be accepted for use by industry and regulatory stakeholders.

In addition, NASA is working with industry, regulatory agencies, academia, and others to advance the state of the art in computational simulation. A goal is to reduce the amount of flight testing, which is expensive for aircraft manufacturers, in favor of certification and qualification by analysis, or CQbA. This large-model IRT test, along with GlennICE development, can be extended to advance computational simulation for in-flight icing certification.

# Terminal Tower Lights Up Mars Red!

In anticipation of NASA's Mars Perseverance rover landing on Mars on Feb. 18, cities across the United States—including Cleveland and its iconic Terminal Tower—lit up the night in “Mars red” on Feb. 17. Millions watched the rover’s successful landing. For more information about the Mars 2020 mission, visit <https://mars.nasa.gov/mars2020/>.



GRC-2021-C-00209

Photo by Quentin Schwinn

## NEWS AND EVENTS

### Observance Reflects on Loss and Lessons

NASA's Johnson Space Center Director Mark Geyer and former astronaut Robert Springer joined Center Director Dr. Marla Pérez-Davis for Glenn's Virtual Day of Remembrance Observance on Jan. 28. Employees paused to remember fallen heroes from astronaut crews as well as other members of the NASA family who have lost their lives furthering the cause of exploration and discovery. Geyer stressed the importance of examining these accidents in evaluating risk and prevention for future missions, while Springer marked the 35th anniversary of the Challenger tragedy by reflecting on his personal relationships with members of the crew. To end the gathering, Amanda Shalkhauser/LEI, played Taps.



GRC-2021-C-00124

Photo by Marvin Smith

*Dr. Pérez-Davis, top right, listens as Geyer, bottom left, discusses Diane Vaughan's book "The Challenger Launch Decision" and its insights into risk evaluation.*

# Glenn STEM Professionals Highlight Diversity at MLK Celebration



GRC-2021-CN-00010

Photo by Christopher Hartenstine

*GLSC's JonDarr Bradshaw, left, moderates a discussion with Glenn STEM professionals, top to bottom: Foster, Dr. Sierra-Sastre, and Dr. Connolly.*

The Great Lakes Science Center (GLSC) held its annual celebration of Martin Luther King Jr. (MLK) Day through an online format on Jan. 18. One of the presentations, "Diversity Drives Innovation: A Conversation with NASA STEM Professionals," featured Glenn researchers and engineers Dr. Joseph Connolly, Lancert Foster, and Dr. Yajaira Sierra-Sastre. They discussed their careers and experiences and challenges as STEM professionals coming from populations underrepresented in STEM fields, and they shared advice on pursuing STEM careers. The event also showcased video profiles of Artemis astronauts and a presentation on the illustrious career of astronaut Dr. Guion Bluford Jr., who is prominently featured in NASA Glenn Visitor Center exhibits at GLSC.

## Senior Leadership Moves

**Dr. Joel Kearns**, who most recently served as Glenn's director of Facilities, Test and Manufacturing, has been named to the NASA Science Mission Directorate's position of Deputy Associate Administrator for Exploration. Previously, he worked as deputy director of Glenn's Space Flight Systems Directorate.

**Bryan Smith** has been named director of Glenn's Facilities, Test and Manufacturing Directorate. He oversees facility infrastructure and the maintenance and operations of all major test facilities at the Glenn Lewis Field campus. He is also responsible for the flight research aircraft, manufacturing facilities, and the center's environmental management program. Smith previously served as director of Space Flight Systems, which is now being led by acting director Kathy Schubert.



Kearns



Smith



# McIntyre Honored in SFA Awards Ceremony

Lauren McIntyre, a computational scientist in the Office of the Chief Information Officer, received a Space Flight Awareness (SFA) Trailblazer Award during a virtual ceremony on Feb. 4. NASA's SFA program recognizes employees who carry major responsibilities for human spaceflight mission success. The Trailblazer Award celebrates the exemplary performance and innovation of early career employees within their first 7 years.

McIntyre was recognized for her outstanding work in proposing innovative methods to incorporate a susceptibility inference network into the Medical Extensible Dynamic Probabilistic Risk Assessment Tool (MEDPRAT). MEDPRAT is a computational model that simulates astronaut health during spaceflight, providing quantitative estimates of medical risk and medical resource utilization given a variety of mission profiles. MEDPRAT supports the ability to perform trade studies across the medical risk domain and can provide insight into which sets of medical resources will mitigate the most risk while meeting mass and volume constraints.

Guest speaker astronaut Chris Cassidy, a veteran of space shuttle and Expedition missions, applauded award recipients for their outstanding achievements in their early careers. He reflected on his Expedition 36 spacewalk with fellow astronaut Luca Parmitano, which was cut short when Parmitano reported water floating inside his helmet. Cassidy stressed the importance of research in helping discover root causes of accidents and near-miss situations to ensure they do not happen again.

Dr. Alotta Taylor, SFA program manager in the Human Exploration and Operations Mission Directorate, moderated the event, which featured award presentations by center leadership to NASA civil servants and contractors across the agency. Glenn Deputy Director Susan Motil shared in introducing and congratulating McIntyre for her accomplishments.



*McIntyre*

## Lewis Little Folks Receives 5-Star Quality Rating

The Ohio Department of Job and Family Services (ODJFS) has awarded its Step Up to Quality 5-Star rating to Glenn's Lewis Little Folks (LLF) Child Development Center.

The ODJFS Step Up to Quality is a child care center rating system administered by the ODJFS and the Ohio Department of Education. It requires centers to meet certain criteria in four domains: Learning and Development, Staff Qualifications and Professional Development, Administrative and Leadership Practices, and Family and Community Partnerships.

"The LLF staff has been preparing for the ODJFS Step Up to Quality for over a year," said LLF Director Maureen Sartain. "Their hard work has resulted in certification as a learning and development program that meets quality program standards that exceed licensing health and safety regulations. The program standards are based on national research identifying standards that lead to improved outcomes for children."



GRC-2021-CN-00009

Photo by Maureen Sartain

*The Step Up to Quality 5-Star Award Winner sign hangs in front of LLF.*



# Glenn Hosts Virtual Tour Season

From April to October, NASA Glenn will host its much-anticipated public tour season, featuring seven world-class facilities from April to October. Due to the COVID-19 pandemic, this year's tour season will be completely virtual. Guests are encouraged to visit Glenn's newly refreshed tour page for enriched content, featured imagery and videos, fact sheets, and articles highlighting the testing taking place at Glenn. There are also links to additional resources—such as content related to Glenn's 80th Anniversary and the center's new online Glenn Exchange Store.

While more information and content are available on Glenn's tour page than ever before, guests are still encouraged to register for a chance to partake in a live event featuring a virtual tour of the selected facility and a question-and-answer session with one of Glenn's researchers.

Space is limited. Selected guests will receive a confirmation email with additional information and details regarding their designated virtual tour.

## 2021 Virtual Tour Schedule

**April 21:** 8- by 6-Foot Supersonic Wind Tunnel

**May 19:** Ballistics Impact Laboratory

**June 22:** Space Environments Complex at NASA's Neil A. Armstrong Test Facility (formerly Plum Brook Station)

**July 13:** Simulated Lunar Operations Laboratory

**August 19:** NASA Glenn Hangar

**September 22:** Zero-Gravity Research Laboratory

**October 7:** Electric Propulsion Power Laboratory

To register or to learn more about Glenn's featured facilities, visit <https://www.nasa.gov/centers/glenn/events/tours.html>.



GRC-2020-C-01391

Photo by Marvin Smith

*Space Environments Complex*



GRC-2019-C-03368

Photo by Marvin Smith

*8- by 6-Foot Supersonic Wind Tunnel*



GRC-2020-C-00807

Photo by Bridget Caswell

*Electric Propulsion Power Laboratory*

# Glenn Sweeps Public Relations Awards



Glenn earned four Cleveland Rocks awards.

**Glenn's Office of Communications**, with assistance from the Imaging Technology Center and Publishing Services teams, recently took top honors in the Public Relations Society of America (PRSA) Cleveland Rocks Awards.

- Gold: Apollo 50th Anniversary Events
- Silver: Artemis I Test, National and Trade Media Relations campaigns
- Bronze: Artemis I Test, Local Media Relations campaign

The awards recognize the best in public relations and communications projects and programs.

PRSA is the nation's leading professional organization serving the communications community.

## RETIREMENTS



Jett

**Thomas A. Jett**, Aviation Test Branch, Facilities, Test and Manufacturing Directorate, retired Feb. 28, 2021, with 35 ½ years of NASA service.



O'Malley

**Terence F. O'Malley**, Space Science Project Office, Space Flight Systems Directorate, retired Dec. 31, 2020, with 35 years of NASA service.

## MORE THAN A MEMORY



DeWitt

**Richard DeWitt**, 84, a 1997 retiree with 40 years of service, died Jan. 21. A U.S. Army veteran, DeWitt was an aerospace engineer whose early work focused on storing cryogenic propellants in space. He developed combustion experiments for the space shuttle and led efforts to use slush hydrogen for the National Aero-Space Plane (NASP) program. His contributions include the design, development, and operation of the Lewis K-Site slush hydrogen test facility. He was project manager for several microgravity experiments in the Space Experiments Division. He earned two Special Achievement Awards (1984, 1991), a Group Achievement Award with the Low-Speed Propulsion Team (1991), and a Space Act Award (1995).

**Donald Striebing**, 63, a 2010 retiree with 30 years of service, died Jan. 15. A U.S. Army veteran and NASA Apprentice School graduate, he worked as a mechanical engineering technician in the U.S. Army Research Laboratory and in the Research Instrumentation Branch of the Fabrication Support Division. Striebing won Group Honor Awards with the Solid Surface Combustion Experiment Team (1991) and Torque Element Repair Team (1992). The Cleveland Federal Executive Board honored him for instrumentation expertise provided to the Corpus Christi Army Depot during Operation Desert Storm (1992).



Striebing

# Are You Ready For an Intern?



**Interns are critical to NASA's mission and helping NASA meet its goals.**

**Are they critical to your organization?**

For more information on requesting an intern for the **2021 fall session**, go to [inside.nasa.gov/education/nif/mentors](https://inside.nasa.gov/education/nif/mentors). Returning mentors can submit a project at [nasa.force.com/Mentors/s/](https://nasa.force.com/Mentors/s/).

**Deadline: June 25, 2021**

Fall 2021 internship projects must be entered into the NASA Internship Application Management System (NIAMS) by June 25, 2021.

POC: Eric Hayes at [eric.w.hayes@nasa.gov](mailto:eric.w.hayes@nasa.gov)



## INFORMATION CAFÉ

On Thursday, March 18, from 11 to 11:45 a.m., the Glenn Library's virtual Information Café will spotlight "Publishing at GRC." Join library staff for an informal chat with Glenn's Publishing Services professionals about the editing, formatting, and graphics assistance that is available for everything from NASA series reports and presentations to directives, flyers, logos, and more. Check [Today@Glenn](mailto:Today@Glenn) for the link.

POC: Robin Pertz, 3-5776

## OUTDOOR SIREN TESTING

Emergency Management Office staff will conduct an audible siren test on the "emergency condition" on Saturday, April 3, at Lewis Field. A mass notification voice test will be conducted at Building 39 on Wednesday, April 7.

POC: Allen Turner, 3-6826

## LEAN SIX SIGMA

NASA agencywide Lean Six Sigma (LSS) Virtual Green Belt Training will take place April 5 to 9, from 9 a.m. to 5 p.m. The training will be facilitated by Mark Adrian, Adrian Technologies Inc. and Peggy Raines, NASA LSS program manager. Registration is required in SATERN course GRC-8E1162.

POC: Peggy Raines, 3-8368

## AEROSPACE TOASTMASTERS MEET

Improve communications and leadership skills through Aerospace Toastmasters. The group meets on Microsoft Teams on Thursdays from 12:05 to 12:50 p.m. For more information, visit <https://aerospace.toastmastersclubs.org/>.

POC: John Wang, 3-3613 or [john.wang-1@nasa.gov](mailto:john.wang-1@nasa.gov)

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



National Aeronautics and  
Space Administration

John H. Glenn Research Center

Lewis Field

21000 Brookpark Road  
Cleveland, Ohio 44135

Neil A. Armstrong Test Facility

3597 E. Scheid Road  
Sandusky, Ohio 44870

[www.nasa.gov](http://www.nasa.gov)

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



# Celebrating 80 Years Looking Back Through the Decades

NASA Glenn was originally established in 1941 as the Aircraft Engine Research Laboratory (AERL), part of the National Advisory Committee for Aeronautics (NACA). The laboratory became a national resource for innovations in aircraft engine technology that transformed commercial and military propulsion systems. Over the decades, NASA's Cleveland-based scientists and engineers advanced technology in both aviation and space exploration, propelling the United States into a leading role in the aerospace industry.

Over the next several months, AeroSpace Frontiers will feature historical photographs to commemorate each decade leading up to the present day.

## The Beginning: 1940s

The site of the National Air Races in Cleveland is transformed into a world-class aircraft engine research laboratory and quickly makes contributions to the war effort. The center recruits women to replace male employees serving in the military, training them as machine operators and electricians and in other technical positions.



GRC-1944-C-05380

*In 1944, women work in the Fabrication Shop of the Aircraft Engine Research Laboratory (AERL) (now NASA Glenn) during World War II.*

## Emergency and Inclement Weather Lines

Lewis Field: 216-433-9328 (WEAT)  
Neil A. Armstrong Test Facility: 419-621-3333

## Connect With Glenn

