

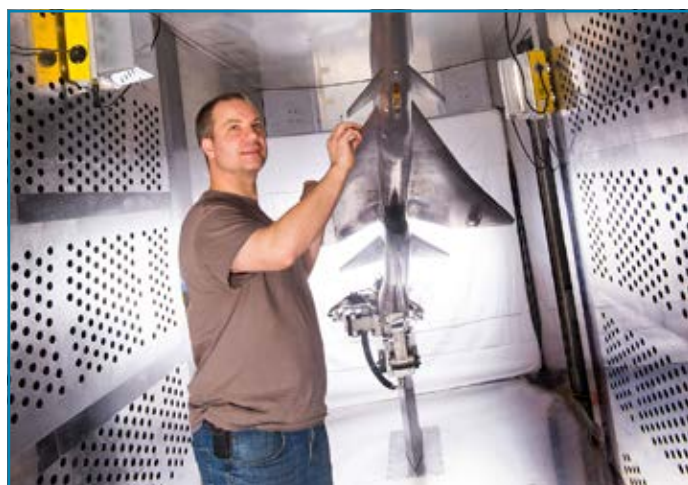


Glenn Tests X-Plane Design for a Quieter Supersonic Jet

Supersonic passenger airplanes are another step closer to reality as NASA and Lockheed Martin begin the first high-speed wind tunnel tests for the Quiet Supersonic Technology (QueSST) X-plane preliminary design at NASA Glenn.

The agency is testing a 9 percent scale model of Lockheed Martin's X-plane design in Glenn's 8- by 6-Foot Supersonic Wind Tunnel (SWT). During the next 8 weeks, engineers will expose the model to wind speeds ranging from Mach 0.3 to 1.6 (approximately 150 to 950 mph) to understand the aerodynamics of the X-plane design as well as aspects of the propulsion system. NASA expects the QueSST X-plane to pave the way for supersonic flight over land in the not too distant future.

Continued on page 2



GRC-2017-C-01023

Photo by Bridget Caswell

Mechanical technician Dan Pitts prepares a 9 percent scale model of Lockheed Martin's Quiet Supersonic Technology (QueSST) X-plane preliminary design for testing in Glenn's 8- by 6-Foot SWT.



The European Space Agency Structural Test Article team bid farewell to the European Service Module (ESM), which left Plum Brook Station on a wide load truck, March 6, bound for Kennedy Space Center in Florida. Over the past 16 months, test engineers from around the world conducted a series of tests on the full-size test version of the ESM in the Space Power Facility. Tests verified the structural integrity of the hardware to withstand the dynamic environment of launch into space atop the agency's Space Launch System rocket.

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2016—A Great Year for the European Service Module Testing at Plum Brook Station

I want to commend everyone involved in the delivery, assembly and testing of the European Service Module Structural Test Article at Plum Brook Station's Space Power Facility. You delivered amazing results, all while keeping safety at the forefront. You are to be congratulated not only for your record in regards to hardware integrity, but also for your diligence in monitoring human safety factors during this long campaign. In addition to the Orion Program, our partners Lockheed Martin, the European Space Agency and Airbus Defense and Space all applauded our constant attention to safety.

NASA Glenn employees are world-class, and I am confident that we will apply the same rigor to the Exploration Mission-1 testing. Thank you for being such good role models for the agency!

—Janet

Hartline is NASA's 2017 Federal Engineer



Hartline

The National Society of Professional Engineers (NSPE) has selected Thomas Hartline, director of Facilities, Test and Manufacturing, as NASA's Federal Engineer of the Year. Hartline received his award at the 2017 Federal Engineer of the Year ceremony in Washington, DC, Feb. 17. Hartline was recognized for significant engineering management responsibility and executive leadership.

The Federal Engineer of the Year Award, sponsored by the Professional Engineers in Government Group of the NSPE, honors engineers who work at a federal agency that employs at least 50 engineers worldwide.

Quieter Supersonic Jet

Continued from page 1

"We'll be measuring the lift, drag and side forces on the model at different angles of attack to verify that it performs as expected," said aerospace engineer Ray Castner, who leads propulsion testing for NASA's QueSST effort. "We also want to make sure the air flows smoothly into the engine under all operating conditions."

The Glenn wind tunnel is uniquely suited for the test because of its size and ability to create a wide range of wind speeds.

"We need to see how the design performs from just after takeoff, up to cruising at supersonic speed, and back to the start of the landing approach," said David Stark, the facility manager. "The 8- by 6-Foot Supersonic Wind Tunnel allows us to test that sweet-spot range of speeds all in one wind tunnel."

Recent research has shown it is possible for a supersonic airplane to be shaped in such a way that the shock waves it forms, when flying faster than the

speed of sound, can generate a sound at ground level so quiet it will hardly be noticed by the public, if at all.

"Our unique aircraft design is shaped to separate the shocks and expansions associated with supersonic flight, dramatically reducing the aircraft's loudness," said Peter Iosifidis, QueSST program manager at Lockheed Martin Skunk Works. "Our design reduces the airplane's noise signature to more of a 'heartbeat' instead of the traditional sonic boom that's associated with current supersonic aircraft in flight today."

According to Dave Richwine, NASA's QueSST preliminary design project manager, "This test is an important step along the path to the development of an X-plane that will be a key capability for the collection of community response data required to change the rules for supersonic overland flight."

NASA awarded Lockheed Martin a contract in February 2016 for the preliminary design of a supersonic X-plane

flight demonstrator. This design phase has matured the details of the aircraft shape, performance and flight systems. Wind tunnel testing and analysis is expected to continue until mid-2017. Assuming funding is approved, the agency expects to compete and award another contract for the final design, fabrication and testing of the low-boom flight demonstration aircraft.

The QueSST design is one of a series of X-planes envisioned in NASA's New Aviation Horizons (NAH) initiative, which aims to reduce fuel use, emissions and noise through innovations in aircraft design that depart from the conventional tube-and-wing aircraft shape. The design and build phases for the NAH aircraft will be staggered over several years, with the low boom flight demonstrator starting its flight campaign around 2020, then other NAH X-planes will follow in subsequent years, depending on funding.

By Jan Wittry

Glenn Partners to Solve Lake Erie Challenges

Did you know that the five Great Lakes—Erie, Huron, Michigan, Ontario and Superior (along with nearby Lake St. Clair and the St. Lawrence River)—contain 20 percent of the world's freshwater supply? NASA Glenn's desire to help protect and improve the water systems for neighboring communities adjacent to Lake Erie has led to a partnership with the Cleveland Water Alliance (CWA).

For the past 2 years, Laurie Stauber, senior program specialist on Glenn's Regional Economic Development (RED) team, has worked with CWA toward that goal. In November 2015, the alliance co-sponsored an Ohio Water Summit where Glenn subject matter experts discussed technology related to water capabilities. Their collaboration led to a Space Act Agreement signed January 2017 to focus on sponsoring Erie Hack 2017.

Erie Hack 2017 is a tech-driven international water innovation competition

and accelerator program. It unites coders, developers, engineers and water experts to generate enduring solutions to Lake Erie's biggest challenges—from invasive species to algal blooms and toxic agricultural waste. The event is similar to Aqua Hacking, hosted last year by the Gaspe Beaubien Foundation in Montreal.

Challenge statements for Erie Hack 2017 were captured in a series of ideation sessions conducted by Stauber and Rebecca Kwiat (ATS) of the NASA Creativity and Innovation Team. They held sessions in Cleveland, Toledo, Buffalo and Detroit, all cities adjacent to Lake Erie with an interest in freshwater. Other cities involved include Windsor and Toronto, Ontario, Canada.

"NASA's bottom line in this initiative is to share our intellect, technologies and other capabilities for freshwater solutions for Lake Erie, the Great Lakes and the whole world," said Stauber. "Ultimately, the goal of Erie Hack is to encourage new industry and create jobs



to improve the regional economy and return value to the taxpayer."

As lead for NASA's Water Initiative, Stauber is assembling a portfolio of agency capabilities and technologies with applications for the water industry.

February 23 marked the kickoff to Erie Hack 2017, where teams ranging from high school students to seasoned professionals selected a challenge statement and the corresponding toolkit assembled by their regional research partner. They are competing for \$100,000 in prizes for the most creative and effective hacks. Mentors from sponsoring organizations are available to help teams construct data-driven solutions to present at the April 13 challenge in Detroit, where a panel of experts will select eight teams to advance to Cleveland for the May 2 and 3 Erie Hack Innovation Summit.

By S. Jenise Veris

Program Celebrates John Glenn's Heroic Flight

NASA Glenn and the Great Lakes Science Center (GLSC) celebrated the 55th anniversary of John Glenn's historic flight aboard *Friendship 7* with a special day of activities, Feb. 20, at the GLSC. John Glenn, who passed away in December, was the first American to orbit the Earth on Feb. 20, 1962.

The event featured remarks by Deputy Director Dr. Marla Pérez-Davis, and a presentation by former astronaut Dr. Donald Thomas, a crew member on four space shuttle missions and Cleveland native.

NASA Glenn Visitor Center galleries were included in the activities, along with displays featuring Glenn and *Friendship 7*, science-based demonstrations, hands-on activities and displays telling the story of the women behind the "Hidden Figures" movie that depicts Glenn's heroic flight. Women currently working at NASA Glenn also shared their stories during a Modern Figures panel discussion.



GRC-2017-C-00823

Photo by Rami Daud

Former astronaut Don Thomas and a future explorer give a thumbs-up for John Glenn and exploration.

Deputy Director Dr. Marla Pérez-Davis addresses the crowd at the GLSC.

Participants Reflect and Rejuvenate at Women IGNITE!

NASA Glenn’s Human Capital Development Division hosted its 2nd Annual Women IGNITE event, March 8, with the theme “Readiness, Resilience and Results.” The workshop encouraged women to build new skills, open their minds to different perspectives and make lasting connections. Robyn Gordon, director of Center Operations, a 2016 Crain’s Women of Note awardee, delivered the keynote address. Several speakers led discussions on the topics of “Traits of Emotionally Resilient People,” “Implicit Bias,” and “Crafting Your Personal Brand: How to Remain True to Who You Are.”

During the event, Glenn’s Women’s Advisory Group announced the 2017 Federal Women’s Program Award recipients. L. Nicole Smith, project manager, Orion Testing at Plum Brook Station, and L. Danielle Koch, an aerospace research engineer in the Acoustics Branch, earned Non-Supervisory Awards. Smith was nominated by Bryan Smith, chief, Space Flight Systems, and Amy Stalker, Structural Mechanics Branch. Koch was nominated by Paula Dempsey, Aeronautics Mission Office. This award recognizes civil service employee contributions to the advancement of women at Glenn, leadership, mentoring and participation in community service.



GRC-2017-C-01137 Photo by Bridget Caswell
Participants discuss topic questions and share recommendations.



GRC-2017-C-01117 Photo by Bridget Caswell
Gordon delivers keynote address.



Smith



Koch

Observance Focused on Education

Three respected educators addressed the theme “The Crisis in Black Education,” during the 2017 Black History Month Observance, Feb. 15. Pictured, left to right: Aaron Jeter, educator, Solon High School; Dr. Patricia Ackerman, executive director, Chalkdust Education Foundation; and Dr. Gregory Hutchings, superintendent, Shaker Heights High School, participated in a panel discussion that centered on the crucial role of education in the history of African-Americans. Glenn’s Office of Diversity and Equal Opportunity and African Heritage Advisory Group hosted the event, in collaboration with the Human Capital Development Division and Office of Communications and External Relations.



GRC-2017-C-00757

Photo by Marvin Smith

News and Events

TechExpo Highlights Latest Technology

More than 150 employees gathered at the upper level of Lewis Field's Main Café to learn about the latest emerging technologies during NASA Glenn's Technology Exposition, March 2. Hosted by the Office of the Chief Information Officer and the Procurement Division's Office of Small Business, the event offered demonstrations and presentations from a variety of companies and networking with industry experts. Employees also gathered for information-sharing sessions on topics such as Secure Cloud Computing, Cybersecurity and Radio Frequency Testing.



GRC-2017-CN-0004

Photo by Robert Piccus

Hidden Figures Author Shares Insight to Movie

Employees across the agency participated via a live-stream broadcast of Margot Shetterly, author of the book that inspired the movie "Hidden Figures," March 7. NASA Langley sponsored the event as part of Women's History Month and Langley's ongoing celebration of its 100th anniversary. Shetterly shared what she described as the "Director's Cut," a view behind the scenes on the effort devoted to ensuring an accurate account of the important role of NASA's "human computers" and how they persevered. Following Shetterly's presentation, Glenn held a panel discussion with several of our own Modern Figures who shared their NASA journeys.



GRC-2017-C-01047

Photo by Rami Daud

Three of Glenn's Modern Figures, left to right, Quynhgia Nguyen, Carol Tolbert and Lizalyn Smith participate in panel discussion moderated by Nola Bland (background).

Upcoming Sustainability Events

*Greening NASA Glenn
One Event at a Time*

Annual Garlic Mustard Pull

Thursday, April 13, 11:30 a.m. to 12:30 p.m., weather pending

Lewis Field: Near Abram Creek, at the bottom of Duct Bank Road

Come help combat invasive species.

Gloves and trash bags provided; dress in boots, hats, sunglasses, etc.

POC: Bethany Eppig, 3-3726

Northeast Ohio Earth Day Coalition's Earth Fest 2017

Celebrating the Year of Vibrant Green Space

Saturday, April 22, 10 a.m. to 5 p.m.

Cuyahoga County Fairgrounds

NASA Glenn will support this event with various displays.

POC: David Smith, 3-5109

Sustainability Fair

Wednesday, May 3, 10 a.m. to 2 p.m.

MIC Auditorium, Lewis Field

Learn about opportunities to protect the environment and peruse items from local vendors.

POC: David Smith, 3-5109



Retirements

Timothy Bencic, Optics and Photonics Branch, Communications and Intelligent Systems Division, retired Feb. 2, 2017, with 33 ½ years of NASA service.

Avis Hudson-Burnette, Office of Diversity and Equal Opportunity, retired March 31, 2017, with 30 years of NASA service.

Thomas H. St. Onge, Space Operations Project Office chief, Space Flight Systems Directorate, retired March 31, 2017, with 40 years of federal service, including 30 with NASA.

Dr. Timothy Tyburski, Exploration Systems Project Office, Space Flight Systems Directorate, retired March 17, 2017, with 27 years of NASA service.



St. Onge

Calendar

MAY OUTDOOR SIREN TESTING:

The Emergency Management Office staff will conduct an outdoor “voice” test at Building 87 on Wednesday, May 3, at Lewis Field. An audible siren test focusing on the “shelter and aid stations” tone will be conducted on Saturday, May 6. POC: Allen Turner, 3-6826

NATIONAL DAY OF PRAYER OBSERVANCE:

The NASA Prayer Group invites all members of the Glenn community to join them for a Christian observance of this special day, May 4. This year’s theme is “For Your Great Name’s Sake!” Observances will be held at 7:30 and 11:30 a.m. See Today@Glenn or type “Prayer” in the WING Transporter for locations and details. POC: Dale Mortensen, 3-6823

IFPTE LOCAL 28, LESA MEETING:

LESA will hold its next membership meeting, Wednesday, May 10, noon, in the Glenn Employee Center’s Small Dining Room.

ASTRONAUT BRIEFING IN MAY:

Expedition 48 Commander Jeff Williams will present a post-flight briefing for employees at Lewis Field on May 11. Look for upcoming Today@Glenn postings for time and location. POC: Zachary Lucas, 3-3812



SPACE APPS CHALLENGE:

Space Apps Challenge 2017 is coming to Glenn April 28 to 30. Students, professionals, engineers and more come from across the region to participate. WE NEED YOUR HELP! Subject matter experts and logistics assistance is needed. Contact Herb Schilling at hschilling@nasa.gov to assist.

Promotions



Dr. Motil

Dr. Brian Motil has been selected chief of the Thermal Systems Branch in the Propulsion Division. Motil previously served as deputy chief of the Fluid Physics and Transport Processes Branch, where he was responsible for implementing the science content for NASA-led microgravity research in Fluid Physics and Complex Fluids.



Schabes

Harvey L. Schabes has been selected chief of the Technology Transfer Office (TTO) in the Office of Technology Incubation and Innovation. Schabes previously served as TTO’s senior strategy manager and has held numerous senior positions in project management and research across the center.



Wittry

Jan Wittry has been selected news chief in the Communications and External Relations Office of the Center Operations Directorate. She previously served as public affairs specialist in the office, and prior to that with the NASA Safety Center.

Connect With Glenn



Emergency and Inclement Weather Lines

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

More Than a Memory

Hoder, A Valued Member of Communications Research

Douglas Hoder, 62, an electrical engineer in the Advanced High Frequency Branch, died suddenly, Feb. 3. Hoder earned a Bachelor of Science degree in electrical engineering and a Master of Science degree in mathematics from Cleveland State University. He also earned a Master of Science degree in electrical engineering from the Georgia Institute of Technology.

Hoder's work over his 27-year career at NASA was largely in the communications field beginning with the Advanced Communications Technology Satellite (ACTS) project and later in the areas of digital, aero and mobile, and radiofrequency (RF) communications. He authored/co-authored nearly a dozen research reports.

"Doug made many contributions in RF communications supporting diverse projects, including most recently Unmanned Aircraft Systems in the National Airspace System. He was a valuable member of the Communications and Intelligent Systems Division and will be greatly missed," said Dr. Félix Miranda, deputy chief.

Hoder also served as chief steward for the NASA Glenn chapter of the International Federation of Professional & Technical Engineers.



Hoder



Ivanov

Ivanov Brought Skill and Enthusiasm

Nedyelko "Ned" Ivanov, 58, a ZIN Technologies (ZINT) employee supporting Glenn's Power Management and Distribution Branch, died unexpectedly Feb. 27. Ivanov immigrated from Bulgaria to Northeast Ohio at the age of 14. He earned a Bachelor of Science in applied physics and a Master of Science in electrical engineering, both from Case Western Reserve University.

"Ned was well-known for being hardworking, positive, enthusiastic and always willing to help out less experienced engineers," said Ivanov's supervisor Alan Richard, ZINT. "Ned used his knowledge of power supply systems and electric motors to further the development of compact efficient motor controllers. His expertise was also valuable in developing a power integration testbed in support of various Solar Electric Propulsion missions. Ned, with his cheery disposition, will be greatly missed."



Albergottie

Clyde "Al" Albergottie, 85, a 1995 retiree with 34 years of federal service, died Sept. 19, 2016. Albergottie was a retired U.S. Navy submariner who brought his expertise in electrical/electronics to NASA in 1961. He served as a manager of several organizations within the Test Installations Division and was president of the Lewis Supervisor's Club. He retired as chief of the Engine Research Branch. Albergottie is survived by his wife, Erma, a retired NASA Lewis contractor.



Posta

Stephen J. Posta, 90, a 1989 retiree with 26 years of service, died Feb. 10. Posta was a U.S. Navy veteran of World War II. He spent most of his career in the Research Installations Branch performing instrumentation work. Significant projects include the Weightlessness Analysis Sounding Probe, one of the early studies of liquid hydrogen behavior in microgravity; and the second Space Electric Rocket Test analyzing an ion engine's reliability and endurance. He contributed 10 technical reports prior to retiring from the Structures Division.



Taylor

Sylvia C. Taylor, 88, a 1990 retiree with 39 years of NASA service, died Dec. 3, 2016. Taylor retired as chief of the Editorial Branch in the Technical Information Services Division. She was active in the Llama Club, predecessor to the Aerospace Toastmasters, and supported the East Tech/Lewis Project for Tomorrow mentorship program. Taylor was a dedicated member of the Lewis Shoe Fund for 20 years.



Zatroch

Adella "Del" Zatroch, 96, a 2006 retiree with 45 ½ years of federal service, died Feb. 27. She joined NASA in 1961 as an administrative assistant and was promoted to executive secretary, a position she held prior to retiring from the Engineering Development Division. Zatroch was well-known for her involvement in center organizations, including the Speaker's Bureau, Business & Professional Women's Foundation and as a union representative. She earned numerous awards, but her most significant legacy is author of "An Oral History of NASA Lewis Research Center." The book was based on dozens of interviews Zatroch conducted with NASA luminaries.

National Aeronautics and Space Administration

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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 via e-mail to the editor: doreen.b.zudell@nasa.gov or 216-433-5317.

May 2017 Calendar section deadline: April 21, 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>

Glenn Celebrates Partnership on Water Purification Technology

NASA Glenn and SageGuard Solutions of Westlake, Ohio, conducted a signing ceremony March 8, celebrating a commercial license for Glenn's high-voltage water purification technology. The technology relies on electricity to remove contaminants—such as bacteria, viruses, parasites, fungi, algae, pharmaceuticals, fertilizers and biowaste—from water without chemicals or filters.

“Water is the new gold. With NASA's plasma technology, we can realize the economic benefits of processing new, life-sustaining water for every person on this planet and perhaps beyond,” stated Ray Erker, CEO of SageGuard Solutions LLC. He also expressed appre-

ciation to Glenn for the overwhelming ease of working through this process.

The high-voltage water purification method was discovered while performing NASA aeronautics research. Looking for a way to improve hypersonic flight using plasma to increase combustion efficiency, Dr. Isaiah M. Blankson, along with colleagues Dr. Grigory Adamovsky of Glenn and Dr. John E. Foster of the University of Michigan, made the discovery. Technical support was provided by Bertram Floyd of HX5 Sierra.

“We are delighted to enter into this commercial licensing agreement with SageGuard Solutions,” said Dr. John Sankovic, Glenn's Office of Technology Incubation and Innovation director.

“The agreement enables SageGuard to pursue opportunities to treat and purify Earth's most precious resource for a wide variety of applications.”

Sankovic added that NASA has a mandate to make technology more broadly available to entrepreneurs who can turn it into new products and industry that can help build the economy nationally and regionally. “NASA technology has already solved some of this century's most challenging technical problems,” he said, “and these solutions are now being used by others in ways never envisioned.”

For more information about technologies available for licensing at NASA Glenn, visit: <http://technology.grc.nasa.gov>.

By S. Jenise Veris



GRC-2017-CN-00005

Photo by Robin Thomson (InnoVector Tech)

Left to right: SageGuard engineer Tony Piunno, Dr. Blankson, SageGuard CEO Erker, Floyd and Dr. Adamovsky tour Glenn's Instrument Research Laboratory.



GRC-2017-C-00997

Photo by Rami Daud

Left to right: Dr. Sankovic officiates the ceremony as Glenn's Deputy Center Director Dr. Marla Pérez-Davis and SageGuard CEO Ray Erker sign license agreement.