



Test Facility Has New One-of-a-Kind Capability

Replicates Ice Crystal Icing Formation

For the first time ever, researchers are demonstrating ice crystal icing formation in the Propulsion Systems Laboratory (PSL), a full-scale-engine test facility at NASA Glenn. No other engine test facility has this capability.

The tests duplicated the natural event of an aircraft's turbofan engine ingesting ice crystals while operating at high altitude and the loss of power that can result. This phenomenon is being studied to gain an understanding of the physics behind ice crystal formation in a turbine engine.

Aircraft, today, routinely fly around or through areas of deep convection that appear innocuous to pilots, but have at times caused air data system instrument failures, engine power loss and engine damage due to ice crystal ingestion into the engine. The impact of these events can range from an instrument anomaly, with no impact on the flight, to multi-engine flameout with subsequent restart.

Honeywell Aerospace, Phoenix, provided the engine that served as the test article, and support staff for the tests. "The Honeywell engine we used for these tests

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C-2013-438

Photo by Bridget Caswell

Pictured is NASA technician, John Wargo, conducting pre-test inspections of the contraction duct leading to the turbofan engine test article—seen in the background.

NASA Glenn Inducted into Space Technology Hall of Fame

NASA Glenn and members of the Inflatable Satellite Communication System team—NASA's Antenna and Optical Systems Branch members



The GATR communications system deployed on the roof of a building during Hurricane Sandy.

Dr. Robert Romanofsky and Kevin Lambert (Vantage Partners) and GATR Technologies' Paul Gierow and William Clayton—was inducted into the 2013 Space Foundation's Space Technology Hall of Fame®.

The team was lauded for their contributions to the development of the GATR Communications System, one of two potentially life-saving innovations recognized during the induction ceremony, April 11, at the 29th National Space Symposium in Colorado Springs.

This honor is reserved for individuals, organizations and companies that effectively adapt and market

technologies originally developed for space to improve the quality of life for all humanity.

The GATR Communications System is a portable, rapidly deployed, inflatable antenna that targets a geostationary satellite to establish mission critical communications. It evolved from a 1998 NASA Small Business Innovation

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Test Facility

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experienced a similar event in the field. Information provided regarding the test engine's field event investigation and resolution is invaluable to the success of these tests," said Mike Oliver, a member of the Icing Branch and lead research engineer for these one-of-a-kind tests, which were performed daily in February.

According to Ron Colantonio, Atmospheric Environment Safety Technologies Project manager at Glenn, "With these tests, NASA is one step closer in accomplishing its goals by recreating a simulated ice crystal environment that has been known to create engine and instrument anomalies during flight in these atmospheric conditions. This capability will increase our understanding of how ice accretes inside an engine and how it affects engine performance and aircraft operability."

Glenn is working with industry to address this aviation issue by establishing a capability that will allow engines to be operated at the same temperature and pressure conditions experienced in flight, with ice particles being ingested into full-scale engines to simulate flight near a deep convective cloud.



C-2013-446

Photo by Bridget Caswell

Above: The NASA-Honeywell engine test team in front of the test cell. Right: The newly integrated spray bar system in the PSL used to produce the required clouds to conduct engine icing research and testing.

The information gained through performing these tests will also be used to establish test methods and techniques for the study of engine icing in new and existing commercial engines, and to develop validation data sets required for advanced computer codes that can be specifically applied to assess an engine's susceptibility to icing in terms of its safety, performance and operability.

—By Katherine K. Martin



C-2012-4163

Photo by Quentin Schwinn

Hall of Fame

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C-2010-3502

Photo by Michelle Murphy

Glenn researchers Dr. Romanofsky, standing, and Lambert.

Research (SBIR) contract awarded to SRS Technologies (now Nexolve) to develop a solar concentrator for power generation. In 2004, GATR (Ground Antenna Transmit Receive) Technologies was formed to adapt the technology SRS initiated for an inflatable prototype and transform it into a licensed product for ground-based communications. Over the next five years, GATR entered into a series of Space Act Agreements to work with NASA Glenn personnel and use the center's test facilities to develop and characterize the prototype to meet the Federal Communication Commission's licensing requirements. This contributed substantially to achieving status as the world's first FCC certified inflatable antenna.

"This technology has benefited the U.S. military and aided disaster relief efforts all over the world—providing critical communications in the aftermath of hurricanes, tornadoes, earthquakes, wildfires and much more," said NASA Glenn Center Director Jim Free. "We are extraordinarily gratified to see how this technology, with roots in the Small Business Innovation Research program, has made such a meaningful impact in people's lives."

Additional information about the Space Technology Hall of Fame®, including a complete list of inducted technologies, is available at www.SpaceTechHallofFame.org.

—By S. Jenise Veris

Plum Brook Becomes Regional Outreach Center for FIRST

Real-World Engineering

This year NASA Glenn raised the level of support to a group of high school students from Erie, Huron and Ottawa counties undertaking the engineering challenge “Ultimate Ascent” for the 2013 U.S. FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competitions. The nearby Plum Brook Station recently became a NASA Regional Outreach Center (ROC) for FIRST.

As an outreach center, Plum Brook’s support of FIRST is now part of a coherent agencywide effort receiving dedicated resources through the NASA Robotics Alliance Project. The alliance fosters opportunities for STEM-related education, such as the mentor-based FIRST program where high school students work side by side with professionals to design and build robots to compete in annual tournaments across the nation.

“Plum Brook can now support local qualifying FIRST teams by claiming them as a NASA ‘house team,’ ” said Richard Evans, Plum Brook’s ROC manager. “The Mavericks, hosted by the EHOVE Career Center in Milan, Ohio, was selected this year.”

Evans said NASA mentors have worked with The Mavericks since 2007, but can dedicate more resources to the team with this new designation.

While Lewis Field has been a ROC for several years, the 50-plus miles between Cleveland and the Sandusky-Milan area made it impractical for teams such as The Mavericks to work with Lewis Field. With the support of management, Evans advocated to the NASA Robotics Alliance Project for Plum Brook to become an outreach center in order to better serve students in and around the Sandusky area.

“Participating in the FIRST Robotics Competition requires teens to use teamwork to address the three primary aspects of real-world engineering—cost, schedule and specifications. This is the true nature of



C-2013-1033

Photo by Marvin Smith

The Mavericks in the Space Power Facility’s Reverberant Acoustic Facility at Plum Brook. Evans (black shirt) and Plum Brook Deputy Director David Taylor (blue shirt) are pictured with the team.

the work they will encounter when working in a real-world setting after they graduate,” Evans said.

He added that the combination of Plum Brook’s regional outreach designation, EHOVE Career Center’s Engineering Technology and Industrial

Program, the availability of an onsite personal fabrication and rapid prototyping FabLab™ at EHOVE, and the FIRST Robotics Competition offers students excellent opportunities to prepare for STEM-related careers.

—By Doreen B. Zudell

Glenn's Pioneering Mentors of FIRST Robotics

When Plum Brook Station earned distinction as a NASA FIRST Regional Outreach Center (ROC) this year, NASA Glenn enhanced its legacy of support for the FIRST Robotics Competition.

“NASA Glenn (Lewis) was the first NASA center to sponsor a FIRST team in 1994,” explained ROC Manager Larry Oberle, Diagnostics and Data Systems Branch. “Our team was one of 120 high school teams that competed across the country that year. Nearly 3,500 teams will compete in 45 regional competitions during the 2013 season.”

Plum Brook’s team from EHOVE Career Center, Milan, competed in the FIRST Buckeye Regional Robotics Competition, March 29–30, at the Wolstein Center in Cleveland. They joined the two Lewis Field-sponsored teams from Cleveland: Youth Technology Academy and East Technical High School.



Oberle and others at Glenn take pride in the growing number of engineers, technicians and other professionals across the agency that have become mentors or team advisors for the FIRST Robotics Competitions since 1995. The value of time spent with these students is an investment in the nation’s next generation of technical leaders.

—By Doreen B. Zudell

Left: Glenn’s Eric Miller mentors a student from the Youth Technology Academy.

News and Events



C-2013-994

Photo by Marvin Smith

Class Completes Leadership University

Twelve employees earned their place as Leadership University II graduates during an onsite commencement ceremony on March 7. The participants completed a 9-month, multifaceted leadership program developed by Glenn's Human Capital Development Division. Associate Director Janet Watkins provided the keynote address, sharing her pride in the graduates' accomplishments and confidence in their abilities to become NASA's future leaders. Leadership University graduates, left to right: Maureen Kudlac, Adam Ross (coordinator), Gynelle Steele, Angela Surgenor, Mary Gibson, Matthew Dolloff, Lynn Capadona, Todd Tofil, Tina Jicha, Ra-Deon Kirkland, Christine Greenwalt, Michael Barrett and Vicki Crable.

Senator Turner Calls for Action

During a thought-provoking keynote address at NASA Glenn's Black History Month Observance, Feb. 28, Ohio State Senator Nina Turner (pictured, right) captivated the audience with personal reflections of people and events that inspired her to seek public office. She noted that like the risk takers behind the Emancipation Proclamation and Martin Luther King Jr.'s March on Washington, the country is at a crossroads and "deliverance is on deck." She stressed that it is time for the current generation to use our talents and/or resources to help ensure equal rights and access to the pathway of prosperity for all. The Urban Dance Collective of the Cleveland School of the Arts, pictured above right, performed at the event.



C-2013-613



C-2013-610

Photos by Bridget Caswell

Science Fair Inspires Engineering Design

Sixteen employees served as Northeast Ohio Science and Engineering Fair judges at John Carroll University, March 5. They presented four NASA Glenn Special Awards to middle and high school students for projects that best demonstrate the fundamentals of engineering design in aeronautical, biomedical, chemical, electrical and mechanical engineering relating to Glenn's missions. The winning projects investigated thrust and lift, carbon nanotubes, antimicro coatings and various transport methods on the force of friction. Pictured, left, is Steve Bauman, Structures Division, and Dovie Lacy, chief of Educational Programs Office, reviewing a science fair entry with a student.



Photo by Angela Surgenor

Stimulate Your Online Learning



Internet-based learning can be more fun when you pair it with interactive videos and graphics. NASA Glenn's Web Portal offers several multimedia features that highlight NASA's technology and people in exciting and interesting ways. Learn about how photovoltaics turn light into energy, how NASA spinoffs make life easier and how aircraft earned the name of Widowmaker, Black Widow and Betty Joe. Log onto <http://www.nasa.gov/centers/glenn/multimedia/index.html> to enjoy the lessons.

Realigning IT Services To Meet Customer Needs

Transforming the Office of Chief Information Officer

Ask any engineer, scientist or researcher, and he or she will affirm Information Technology (IT) is a fundamental institutional capability that is key to their ability to do quality work. It can mean the difference between mission success and failure.

That is why, over the past several months, NASA Glenn's Office of the Chief Information Officer (OCIO) staff conducted an intensive review of its products and services to create a new business model that aligns IT strategies and investments to the center's missions and provides customer-focused support.

"Our IT 'mission specialists' meet with organizations across the center to understand specific needs and recommend appropriate services," said Chief Information Officer William "Randy" Humphries. "We're committed to building IT excellence and enabling success in our missions."

Additionally, the OCIO appointed an IT Chief Technology Officer (CTO), Les Farkas, who oversees the technology assessment of Glenn's IT environment. Farkas represents Glenn's IT interests as part of the agency CTO working group, and helps to identify emerging IT technologies that can best support NASA's technology needs in a rapidly changing world.

The office now provides a comprehensive online catalog of services, including most-requested brokered services (i.e. services provided through the I3P contracts). The catalog, along with other details and information related to IT products and services, is available on the newly revised OCIO website, www.ocio.grc.nasa.gov.

—By Doreen B. Zudell

OCIO Services Spotlight

Here are a few examples of OCIO's most sought-after services helping to enable the NASA Glenn mission. These and many others are outlined in the online catalog.

Hosting Service—Hosting service provides a virtual machine that includes system software (Windows and Linux), system administration, backups and an IT security plan.

Security Planning—Security planning, security assessments, audits and agency reporting.

Website and Applications Development—Web application and website development, maintenance and operations.

Greening NASA Glenn—One Event at a Time

GRC's Green Earth Committee has another full slate of environmental and sustainability awareness events scheduled for this year.

Sustainability Kick-off and Earth Week Event: April 18, noon-1 p.m., building 15 Cafe at Lewis Field; Dr. Rickey Shyne will kick-off our sustainability event season; tree seedlings and native plant seed giveaway.

Garlic Mustard Pull: April 19, noon-1 p.m., Lewis Field, West Area, Duct Bank Road near Abrams Creek. Help pull invasive garlic mustard. Trash bags and gloves provided. Bring a hat, sunglasses and sunscreen for protection. POC: Teresa.L.Monaco, 3-8293.

EarthFest 2013: Sunday, April 21, 10 a.m.-5 p.m., Cuyahoga County Fairgrounds (previously held at the Zoo). Ohio's largest environmental education event. Visit <http://www.earthdaycoalition.org>.

Rain Barrel Workshop: May 2, 11:30 a.m.-1 p.m., Picnic Grounds. Save water and prevent storm water pollution by building your own rain barrel. Cost for workshop is \$60. POC: Stacey Yanetta, 3-6468.

Garlic Mustard Pull at Plum Brook: May 9, noon-1 p.m. Meet along Line Road 15, just south of North Magazine Road. Help pull non-native, invasive garlic mustard. POC: Rosemary Walker, 4-3250.

Eco-painting and Environmental Initiatives for Your Home: May 16, noon-1 p.m., building 15, Small Dining Room.

Vermicomposting: July 18, noon-1 p.m., building 15 Small Dining Room. POC: Tom Hinshaw, 3-5462.

Sustainability Fair: Sept. 18, 10:30 a.m.-1:30 p.m., greenspace north of Stratton Road (across from building 3); vendors, exhibits and more.



New Automated Tool for Appraisals

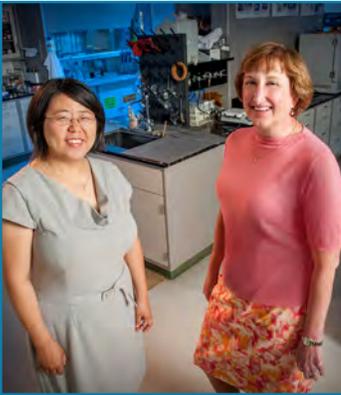
Beginning in May 2013, all NASA GS employees and their supervisors will begin using a new automated tool to conduct the performance management process. The Standard Performance Appraisal Communication Environment (SPACE) is a performance management tool developed by NASA that automates NASA's Employee Performance Communication System (EPCS).

SPACE does not replace EPCS; it is a tool that automates the EPCS process. The tool does not replace or diminish the importance of supervisor-employee, face-to-face communications about performance management, but rather supports these critical discussions. Specific training and job aids are being developed for supervisors and employees. Everyone is encouraged to take advantage of the training opportunities as they become available in the April/May timeframe.

Awards, Honors and Promotions

NorTech Honors Glenn Advance in Aerogels

Polyimide aerogels, an advance in aerogel technology developed by NASA Glenn's Dr. Mary Ann Meador and Ohio Aerospace Institute's Dr. Haiquan Guo, took top honors at the 2013 NorTech Innovation Awards ceremony, March 14.



C-2012-2551 Photo by Michelle Murphy

Dr. Guo, left, and Dr. Meador.

Aerogels are highly porous, low-density solids with extremely small pore sizes, known to be a superior material for insulation. The NASA-developed polyimide aerogels are a major advance over the fragile silica aerogels because they are 500 times stronger and can be made into foldable thin films or a thicker form molded to shapes or panels for widespread use. No other type of aerogel possesses the compressive and tensile strength of Glenn's innovation while still retaining its ability to be flexibly folded to contour to whatever shape is needed.

NorTech, a nonprofit technology-based economic development organization serving 21 counties in Northeast Ohio, in partnership with *Crain's Cleveland Business*, honors breakthrough innovations that have made or have the potential to make a dramatic impact on a specific industry or market sector in the region.

More information on this award and Glenn's aerogels technology development, is available at http://www.nasa.gov/centers/glenn/news/pressrel/2013/13-010_nortech.html.

Wong, Asian American Engineer of the Year



Photo by Lisa Wong

Glenn's director of Research and Technology Dr. Jih-Fen Lei, left, with Wong at ceremony.

The Chinese Institute of Engineers, as part of its 2013 National Engineers Week programming, presented Wayne Wong, an aerospace engineer in NASA Glenn's Thermal Energy Conversion Branch, the Asian American Engineer of the Year award. Wong was among 19 Asian American engineers, scientists and executives from industry, academia and government agencies, who received national honors during the awards ceremony, March 2. He was recognized for exceptional leadership and impact in the development of an advanced Stirling convertor that dramatically improves the efficiency of space radioisotope power systems to enable future NASA science missions. Wong's contributions within the Cleveland Asian American community were also highlighted.

Interns, Graduates and Veterans Welcomed

Student interns, recent graduates and military veterans were among the recent hires to join the NASA Glenn family during the months of January and February.

They include: Tyler Burba, engineering student trainee, Systems Definition and Communications Branch; John Gatto, aerospace engineer, NASA Safety Center; Joseph Dorsey, contract specialist, Exploration Systems Branch; James Johnson, security specialist, Office of Protective Services; Jonathan Millard, liquid propulsion systems, Space Propulsion Branch; Abigail Rodriguez, engineering student trainee, Quality Engineering and Assurance Branch; and Robert Sherman, IT specialist, Risk Management and Security Division.



C-2013-806

Photo by Bridget Caswell

Pictured, front, left to right: Rodriguez, Gatto, Sherman and Johnson; back: Dorsey, Burba and Millard.

In Appreciation

I would like to sincerely thank my friends and colleagues for the flowers, cards, prayers and generous contributions to the American Heart Association after the recent passing of my father, Andrew Straub. Your kindness and generosity means more to me than you could ever know.
—Cheryl Varney

Retirements

Linda Dukes-Campbell, Community and Media Relations Office, Center Operations Directorate, retired March 29, 2013, with 22 ½ years of NASA service.



Dukes-Campbell

Exchange Online Gift Shop
www.nasagiftshop.com

In Memory

Smalley Remembered for Integrity and Humor



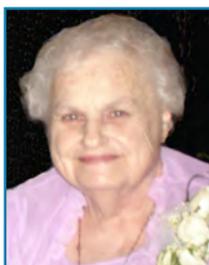
Smalley

John H. Smalley, 60, an SGT employee supporting the Logistics and Technical Information Division (LTID), Center Operations Directorate, died Feb. 27.

Smalley worked all of a nearly 27-year career at the center in the LTID. As a transportation driver, he had a reputation as a reliable driver who focused on safe operation and satisfied delivery of cargo to his customers.

“Many of his coworkers will remember John’s light-hearted character and ability to see the humor in most situations, which often made us laugh,” said Jeanine Hanzel, SGT/Logistics manager. “However, he was also a dedicated father and husband, who often expressed pride in the accomplishments of his family.”

Margaret Benko, 84, who retired in 1993 with 19 years of federal service, died Jan. 31. Throughout her NASA career, Benko supported several branches in the Materials Division, where she earned multiple service awards and a Group Achievement Award as a member of the Oxidation Workshop Organizing Team. Benko previously served with the Veterans Administration and Naval Department.



Benko

David E. Justavick, 64, who retired in 2008 with 38 years of NASA service, died Jan. 28. Justavick was a mechanic

in the Test Installation Division, whose career was largely devoted to supporting Icing Research Tunnel (IRT) tests and operations. He merited several Suggestion Awards for IRT process improvements and was a valued member of an IRT Operations team that earned several Group Achievement Awards. Justavick frequently drove the NASA Aerobus, an important tool in Glenn’s outreach efforts.



Justavick

Raymond D. Viancourt, 81, who retired in 1992 with 40 years of federal service, died Jan. 29. Viancourt was a U.S. Air Force veteran, who entered NASA as an electronics technician in the 1959 class of the Trades Apprentice Program. He later became a supervisor in the Electronic Section of the Engineering Division. Viancourt was on several awarding teams, including the SITE Project Development Team and ESCORT-III that developed laboratory facilities for testing and evaluating advanced communications networks.



Article Submissions

News items and brief announcements for publication in the May issue is noon, April 19. Larger articles require at least one month notice.

READ US ON THE INTERNET:

<http://aerospacefrontiers.grc.nasa.gov>

Hermes
Award
2009-
2012



Emergency and Inclement Weather Lines

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

Calendar



National Library Week April 14–20

Libraries play a significant role in our lives and work through collections, digital resources and more. Stop by Glenn’s Library Commons this week and watch *Today@Glenn* for more information about the upcoming open house in building 142.

GRC CONNECTIONS: The next GRC CONNECTIONS forum will be held April 18 from 10 to 10:45 a.m. in the Briefing Center Auditorium.

LUNCH WITH THE DIRECTOR OF: Tom Hartline, Engineering Directorate, will host the next Lunch with the Director Of on April 24 from noon to 1 p.m. in the Small Dining Room, building 15.

MAY PUBLIC TOUR: The next Saturday tour, May 4, will highlight the Altitude Combustion Stand Facility. Tours are open to U.S. citizens and lawful permanent residents. Space is limited and reservations are required for admission. To register, call 216-433-9653 or send an email to sheila.d.reese@nasa.gov. For more information and a complete schedule of Glenn’s tours, visit <http://www.nasa.gov/centers/glenn/events/tours.html>.

IFPTE LOCAL 28, LESA MEETING: LESA will hold its next membership meeting on Wednesday, May 8 at noon in the Employee Center’s Small Dining Room.

RETIRED NASA WOMEN’S LUNCHEON: The next NASA Retired Women’s Luncheon will be Thursday, May 16 at 1 p.m. (note time) at Longhorn Steakhouse at Westgate, corner of W. 210 and Center Ridge Road. Contact Gerry Ziemba, 330-273-4850, to reserve your place.

NATIONAL DAY OF PRAYER: Glenn’s Prayer Group invites members of the Glenn community to join them for a Christian observance on this special day, May 23. This year’s theme is “Pray for America.” Observances will be held at 7:30 a.m. and 11:30 a.m. See *Today@Glenn* or type “Prayer” in the WING Transporter for locations and details.

National Aeronautics and Space Administration

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Lessons in Sustainability

Employee Aids Community Food Bank

After viewing a highway billboard message: “1 of 4 children in America go to bed hungry every night,” NASA Glenn’s Tom Hinshaw was awed by the reality that hunger exists in his own community, and he vowed to do something about it.

In September 2012, Hinshaw, an architect in the Facilities Division, founded Heartland Harvest, an outreach program to demonstrate sustainable food production and distribute fresh, healthy food to the Medina County food bank and other area programs. Over the past 6 months, Hinshaw has dedicated his evenings and weekends serving as project manager for the program.

Current projects include constructing an aquaponic farm to produce fresh fish (tilapia) and vegetables in a closed-loop sustainable system; a berry farm to raise revenue; and a community container garden to share produce.

“With the help of others in my community and NASA volunteers, I initiated Heartland Harvest projects on acreage at my church, Heartland Community Church,” Hinshaw explained. “However, we soon expanded our efforts to farmland in the nearby Spencer community.”

Pictured, right: Hinshaw inside a greenhouse that will house the future aquaponic system in Medina. Below: Example of vegetables grown using an underground irrigation system.



A strong advocate of the adage: “Give a man a fish, feed him for a day; teach a man to fish, feed him for a lifetime,” Hinshaw wants to share his knowledge with others. This summer, Heartland Harvest will offer weekly gardening sessions with area youth. Local Cub Scouts and 4-H groups are already tending container gardens. In addition, classes are being developed to train these students about nutrition and how chemicals can affect the soil and their health.

“I’m also working with the Ohio State University Extension Office in

providing the resources for teaching youth at risk,” Hinshaw explained. “Participants will experience farming firsthand by growing their own food and sharing their abundance with others in need.”

A member of GRC’s Green Earth Committee and instructor in Sustainability in Design at the ITT Technical Institute (Strongsville), Hinshaw points to the Rid-All Green Partnership in Cleveland as the example of what he is trying to accomplish and a great resource for technical support. One of his goals for Heartland Harvest is to replicate the Rid-All Green Partnership’s facility and success. In fact, he has already begun construction on the prototype.

—By S. Jenise Veris