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National Aeronautics and Space Administration

Headquarters
Washington, DC 20546-0001

September 27, 2017

Office of Communications

FOIA: 17-GRC-F-01134

Thank you for your Freedom of Information Act (FOIA) request dated September 10, 2017, and received September 12, 2017 at the NASA Headquarters FOIA Office. Your request will be processed our office on behalf of the Glenn Research Center (GRC). Your request has been assigned FOIA Case Number 17-GRC-F-01134 and is for:

> A copy of any index to the Glenn Aerospace Frontiers newsletter. AND
> A digital/electronic copy of the issues of the Glenn Aerospace Frontiers newsletter from the calendar year 2013.

The NASA Headquarters program office(s) conducted a search for Agency records. We have identified 97 pages of responsive records in response to your request for digital copies of the Glenn Aerospace Frontiers newsletter from calendar year 2013. These documents are releasable in full. Please be advised that an index to the Glenn Aerospace Frontiers newsletter does not currently exist. In accordance with 14 CFR § 1206.301(g) and Department of Justice Guidance, the Agency is not required to create or compile a record in response to a FOIA request. The Act applies only to records in the possession and under the control of the Agency and in existence at the time the Agency begins its search for responsive documents.

Fees for processing this request are less than $50.00 and are not being charged in accordance with 14 CFR §1206.504(f).

For your information, the Office of Government Information Services (OGIS) offers mediation services to resolve disputes between FOIA requesters and Federal agencies. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, Room 2510, 8601 Adelphi Road, College Park, Maryland 20740-6001 or ogis@nara.gov.

If you have further questions, please feel free to contact me at hq-foia@nasa.gov or (202) 358-2339, or you may contact Miriam Brown-Lam, Principal Agency FOIA Officer and Chief FOIA Public Liaison at (202) 358-0718.

Sincerely,

Martha Terry
NASA FOIA Officer
Headquarters, Office of Communications

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 1 JANUARY 2013

NASA Technology Days: Partnering to Infuse Technology

Agency Research Makes Economic Impact

Hundreds of people poured through the Cleveland Public Auditorium and Conference Center during NASA Technology Days, Nov. 28–30. They came with a sense of hope and enthusiasm that the technologies featured at the agency-sponsored event could improve their operations, reduce costs or build better products.

Nearly 100 mature NASA-funded technologies—relating to aerospace, advanced energy, automotive, innovative manufacturing and human health industries—were on display across 75 booths.

Staff from Glenn and NASA Headquarters' Office of the Chief Technologist hosted the 3-day event with support

Continued on page 2

Pictured, right: Energy and excitement abounded during STEM Day at the NASA Technology Showcase.

C-2012-5819 Photo by Marvin Smith

Center Director Shares 2012 Accomplishments at All Hands

On Dec. 10, Center Director Ray Lugo hosted his final All Hands Meeting as director of NASA Glenn Research Center from the Briefing Center at Lewis Field and broadcast live on Glenn TV to Plum Brook Station.

C-2012-5932 Photo by Bridget Caswell

In his address, Lugo thanked employees for their support to him over the past 2 years and for their commitment to the NASA mission. He highlighted 2012 accomplishments from each directorate or office. The following are a few of the most significant highlights:

1. Parachute Testing

Glenn completed the experimental test program in the 10-by 10-Foot Supersonic Wind Tunnel to validate the design of the parachute deployment system for the European Space Agency ExoMars robotic planetary mission.

Continued on page 4

Pictured, left: Center Director Lugo shares center accomplishments during his last All Hands meeting as center director.

In This Issue

Holiday Gatherings Bring Cheer

Making Spirits Bright!

Last month, NASA Glenn employees took some time to celebrate the holiday season with one another.

On Dec. 13, Center Director Ray Lugo and his senior staff gathered with civil servant and contract employees in the Engineering Building at Plum Brook Station. They socialized while enjoying refreshments and good cheer.

The following morning, Dec. 14, Director Lugo hosted Lewis Field's 2012 Holiday Gathering featuring the "GRC's Got Talent" show in the Administrative Building auditorium. Master of Ceremonies Lance Foster, Research and Technology Directorate, introduced 10 employees who shared talents ranging from Irish dancing to a dramatic "spoonerism" reading of Mement C. Cloore's "A Visit by Naint Sick." The capacity-filled auditorium of civil servant and contract employees cheered on fellow workers and cast their ballots for their favorite acts.

Continued on page 8

Pictured is a collection of photos from the Plum Brook gathering.

C-2012-7129

C-2012-6100

C-2012-6090 Photos by Bridget Caswell

C-2012-5756 Photos by Marvin Smith

C-2012-6054

C-2012-5674

Above, top, Glenn engineers staff the flywheel technology booth, and, above: the aero chevron nozzle technology booth. Right: NASA Associate Director Lightfoot gives his keynote address.

Showcase Encourages Partnerships

Continued from page 1

from NASA's Langley Research Center and Goddard Space Flight Center. The team presented technology demonstrations, informational presentations and poster sessions to showcase NASA's cutting edge research and technology development.

Keynote speaker NASA Associate Director Robert Lightfoot joined in the opening day festivities with other NASA program officials to highlight the agency's upcoming technology initiatives. Also featured were one-on-one sessions for participants to discuss the process of technology transfer and establish strategic partnerships with NASA.

On the second day, Cleveland Mayor Frank Jackson reinforced sentiments expressed earlier in videos by Ohio's senators, and former senator John H. Glenn, regarding investing in technology not only for the sake of science and human exploration but also to boost the economy. The third day was devoted to STEM-related presentations and demonstrations to inspire high school and college student attendees.

"This venue offered Glenn technologists and NASA stakeholders from industry, academia and the U.S. government opportunities to rapidly partner on advancing technology development," said Dr. Robert J. (Joe) Shaw, deputy director of Glenn's Office of Technology Partnership and Planning. "It also set the groundwork for Glenn's long-term impact on the economic development of the region."

—By S. Jenise Veris

News and Events

Director Meets With Retirees ˇ

C-2012-5952 Photos by Bridget Caswell

C-2012-5977

C-2012-5971

Center Director Ray Lugo hosted a briefing for retirees on Dec. 10 to update them on NASA Glenn activities. Several senior staff members gave presentations in the areas of aerospace technology and strategic goals, budget and the Center Facility Master Plan. Before and after the presentations, retirees socialized with one another and senior staff and learned more about advancements in Glenn's core technologies at kiosks in the Briefing Center.

ˇ VIP Visits

In recent months, Glenn hosted a number of U.S. congressional and Ohio local and state officials, some of whom were first-time visitors. The visits are part of the center's strategy to enhance major stakeholders' understanding of NASA and Glenn's research and technology developed to support mission success. The visitors met with Center Director Ray Lugo and selected senior staff for an overview of the center, emphasizing Glenn's mission, workforce, budget and economic impact, followed by facility tours highlighting the center's work in aeronautics, space flight technology, communications and alternative energy. For some guests, the schedule also included a one-on-one visit with subject matter experts at the Briefing Center kiosks, highlighting Glenn core competencies and their applications to a wide range of research and technology development.

Pictured:(1) Cuyahoga County Executives on a tour in the Electric Propulsion Laboratory. (2) Sen. Rob Portman at the Small Multi-Purpose Research Facility. (3) Congresswomen (in blue) Loretta Sanchez and Marcy Kaptur, accompanied by Associate Director Janet Watkins, at the In-Space Propulsion kiosk in the Briefing Center, staffed by George Soulas and Diane Linne, Propulsion and Propellants Branch. (4) Twenty-six mayors from Northeast Ohio toured the Icing Research Tunnel.

C-2012-5916 Photo by Bridget Caswell

C-2012-6008 Photo by Christopher Lynch

C-2012-6184 Photo by Michelle Murphy

C-2012-5131 Photo by Marvin Smith

NASA Named "Best Place to Work"

NASA was named the best place to work in the federal government among large agencies in a survey released by the Partnership for Public Service, nonprofit, nonpartisan organization. The Best Places to Work in the Federal Government® rankings draw on responses from nearly 700,000 civil servants to produce a detailed view of employee satisfaction and commitment across 362 federal agencies and subcomponents.

The majority of the data used to develop these rankings was collected from the Office of Personnel Management's Federal Employee Viewpoint Survey. The survey was administered April 2 through June 30, 2012, to full- and part-time permanent executive branch employees.

PARTNERSHIP FOR PUBLIC SERVICE


C-2012-3983


C-2012-2370

Continued from page 1

2. Cryogenic Propellant Readiness

Glenn was part of a multicenter team that conducted a series of tests to mature cryogenic fluid management technologies to readiness level 5.

3. Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)

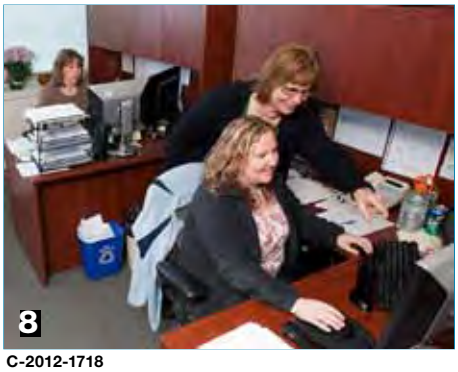
Glenn continues to lead the agency in lead subtopic roles. In the FY12 solicitation, we have 18 SBIR subtopics, two STTR subtopics, and one newly developed select subtopic, all aligned with Glenn's core competencies.

4. Combustion & Fluid Physics on ISS

Researchers in the Research and Technology Directorate completed eight combustion and fluid physics experiments on International Space Station that provided new scientific knowledge and new life images.

2012: YEAR IN REVIEW HIGHLIGHTS


C-2012-658


C-2012-1718


C-2012-1681

8. Travel and Purchase Consolidation

In April, the Office of the Chief Financial Officer oversaw the launching of the first wave to consolidate travel request and purchase requisition functions. The initiative, completed in September, was implemented to promote efficiencies.

5. Communications Extraordinaire

In February, the Glenn-developed Space Communication and Navigation (SCaN) Testbed left the center bound for Japan. In July, the testbed was launched to the space station onboard a Japanese transfer vehicle. The unit is up and operating!

6. B–2 Hydrogen Ready

The Plum Brook Management Office conducted the first thermal vacuum liquid hydrogen test at the Spacecraft Propulsion Research Facility (B–2) in over a decade.

7. Safely Decommissioning a Reactor

The center completed the 12-year long Nuclear Reactor Decommissioning project for the Plum Brook Reactor Facility and received the Site License Termination from the Nuclear Regulatory Commission in November.

Utilities Cost Savings

The Office of the Chief Counsel settled the City of Cleveland Water Department's claim for $2.4 million in past water charges for a one-time payment of $500,000 that will also result in an estimated continued cost avoidance of $180,000 per year in future water charges to Lewis Field.

9. Creativity Spurs Diversity & Inclusion

The Office of Diversity and Equal Opportunity collaborated with the Creativity and Innovation team to develop a Diversity and Inclusion action plan. This plan will help formulate the center's Diversity and Inclusion Strategic Plan.

10. Emmy Award

In June, the Glenn-based team of producers earned an Emmy Award from the National Academy of Television Arts and Sciences–Lower Great Lakes Chapter for "NASA Now," the online video series for the Explorer Schools Project, under the Center Operations Directorate.

11. Technology Roadmaps

Last spring, with significant leadership from Glenn, the agency finalized 14 Space Technology area roadmaps that identify each technology area's top challenges, then posted the final roadmaps to the Office of Chief Technologist website.

C-2012-2871

12. Sharing the NASA Mission

The center conducted a number of major outreach events in 2012 to provide information aimed at increasing the NASA's visibility and contributing to scientific literacy. Some of the most significant events included the 50th Anniversary of John Glenn's Flight, the Transit of Venus, the Space Communications and Navigation Testbed launch and the Mars Curiosity Rover landing.

13. Enhanced Mobile Learning

The Office of Human Capital Management led the center in successfully implementing the SATERN 6.4 upgrade offering major benefits in mobile learning, user-friendly navigation and improved search functionality.

Improved S&MA Curriculum

The NASA Safety Center rolled out the cross-discipline and leadership curriculums for the Safety and Mission Assurance Technical Excellence Program (STEP) in July 2012 to better meet the developmental goals of the professionals in safety and mission assurance.

14. IT Service Provider Transition

During the transition to the ACES contract, the Office of the Chief Information Officer replaced 1900 desktop and laptop computers, replacing more than half of the legacy hardware with new computers.

15. HECC Program Milestone

The Aeronautics Research Office reached a center level milestone in the High-Efficiency Centrifugal Compressor (HECC) program by completing performance testing of state-of-the art centrifugal compressor stage in the refurbished CE-18 test cell.

C-2012-3745

Retirements

Bagnell

Conrad

Edwards

Laura Bagnell, Logistics and Technical Information Division, Center Operations, retired Dec. 29, 2012, with 37 1/2 years of NASA service.

Kurt Brocone, Exploration Systems Branch, Procurement Division, retired Dec. 29, 2012, with 35 1/2 years of federal service, including 32 1/2 with NASA.

Russell Claus, Multidisciplinary Design Analysis Optimization Branch, Aeropropulsion Division, retired Dec. 31, 2012, with 39 years of NASA service.

Dennis Conrad, Human Capital Development Division, Office of Human Capital Management, retired Jan. 3, 2013, with 42 years of federal service, including 32 with NASA.

John DeLaat, Controls and Dynamics Branch, Communications, Instrumentation and Controls Division, retired Dec. 1, 2012, with 35 1/2 years of NASA service.

Daryl Edwards, Fluid Systems Branch, Mechanical & Fluid Systems Division, retired Jan. 3, 2013, with 39 years of federal service, including 33 with NASA.

Susan Print, Center Operations Support Branch, Mission Support and Integration Division, retired Dec. 31, 2012, with 31 1/2 years of NASA service.

George Readus Jr., Space Power & Propulsion, Communication and Instrumentation Branch, Testing Division, retired Dec. 29, 2012, with 36 years of NASA service.

Awards, Honors and Promotions

C-2012-5890 Photo by Michelle Murphy

History Book Signing

Bob Arrighi/WYLE/Logistics and Technical Information Division, NASA Glenn's archivist and author of the book "Pursuit of Power," discussed highlights and signed a complementary book for employees at Glenn's Science and Engineering Library on Nov. 19. Arrighi's book details the history of Glenn's Propulsion Systems Laboratory No. 1 and 2, which, from 1952 to 1979, served as one of the nation's most important ground-based engine research facilities for testing full-scale engines at simulated flight altitudes.

Glenn/SAIC Team Wins Design-Build Award

The Design-Building Institute of America (DBIA) presented NASA Glenn and the Science Application International Corporation (SAIC) a national award in Industrial/Process/Research Facilities for their advanced design-build project delivery at the 2012 Design-Build Conference and Exposition, Nov. 7–9 in New Orleans. NASA's Vibro-Acoustic Test Capability (VTC) facility, a major component of the Space Environment Test (SET) Project, was selected for its technical difficulties and excellence. Glenn employees Carol Ginty, SET project manager and COTR; Susan Motil, former SET project manager; and Damian Ludwiczak, SET chief engineer; and SAIC employees Dr. Dennis Nihiser and David Absher accepted the award.

Pictured with the award, left to right: Dr. Nihiser, Motil, Ginty, Ludwiczak and Absher.

Coming in Spring 2013!

Phase Two of the New Glenn Visitor Center

Attention visitors—the Great Lakes Science Center in downtown Cleveland recently began renovating its space galleries. During the construction period, please be aware that areas of the NASA Glenn Visitor Center will be closed. The highly anticipated second phase of the new NASA Glenn Visitor Center will open on March 30 and feature new hands-on exhibits, artifacts, videos and more. Watch *Today@Glenn* for future updates and announcements about this renovation project.

C-2011-03786 Photo by Marvin Smith

STS-135 crew at the NASA Glenn Visitor Center at the Great Lakes Science Center.

Emergency and Inclement Weather Lines

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

In Memory

John E. Butauski, 63, who retired in 2009 with 18 years of NASA service, passed away Nov. 22. Butauski was a veteran of the U.S. Marine Corps, before joining the NASA workforce. He graduated the Lewis Trades Apprentice Program in 1995 and served as a research laboratory mechanic in the 10- by 10-Foot Supersonic Wind Tunnel and Aero-Acoustic Propulsion Laboratory. In 2000, Butauski was one of several technicians honored following a detail to NASA Stennis for the "build-up and installation of electrical boxes for an upcoming Integrated Powerhead Demonstrator; assistance in setup for the Hybrid Sounding Rocket test program; and buildup and fabrication of the Master Facility Panel, critical to tests on FASTRAC, a NASA test model rocket engine program."

Peter M. Getz, 91, who retired in 1974 with 22 years of federal service and was a decorated U.S. Army veteran of World War II, died Oct. 17. He joined NACA/NASA in 1954 and served as group leader in the Erection & Repair Section of Facilities Operations Division, responsible for installation of research support hardware and general maintenance. Eleven years prior to retiring, Getz was as a production controller in the Technical Services Coordination Office.

Charles F. Hnatek, 81, who retired in 1987 with 33 years of NASA service, died Nov. 30. Hnatek was a U.S. Air Force veteran who entered the Lewis Trades and Apprentice Program and graduated in 1959 as a flight propulsion mechanic. He was a member of the Test Installation Division that supported facility preparation and fan stage operations for the Vertical and/or short take-off and landing (V/STOL) aircraft research.

Hnatek

Mirtich

Michael J. Mirtich, 76, who retired in 1994 with 35 years of NASA service, died Oct. 24. Mirtich was a distinguished research physicist, who served in the Electro-Physics Branch of the Power Technology Division. He was a co-inventor of two prominent Glenn-developed and commercially successful transferred technologies. In 1984, he shared a patent with Bruce Banks, chief of Electro-Physics, and James Sovey for a "Process for Deposition of Diamondlike Carbon Films" that was licensed and modified as The DiamondHard® technology applied to the lens of the Ray-Ban® Survivors® Collection sunglasses. The lenses are manufactured and marketed by Bausch & Lomb, Inc. The coatings make them 10 times more scratch-resistant than conventional glass lenses. In 1987, Mirtich shared another patent with the same team for "Oxidation Protection Coatings for Polymers." Later, Glenn researcher Sharon Miller joined the team and they developed a solar array blanket protection technology that represented a breakthrough in polymers used as thermal and structural blankets on spacecraft to retain their properties during long periods of exposure to the atomic oxygen in low-Earth orbit. The coatings were then applied to the solar array blankets used on the International Space Station as well as the U.S.-supplied solar array used on Russia's Mir Space Station.

Frank E. Rom, Sr., 86, who retired from NASA in 1973 with 25 years of service, died Nov. 4. Rom was a U.S. Navy veteran of World War II, who joined the NACA/NASA workforce 1948. He was a scientist who had a lengthy career in nuclear propulsion. Rom was one of NASA's pioneers who designed the NASA Plum Brook Reactor Facility. He was instrumental in the development of applications of nuclear energy for research and alternative technologies. Rom authored numerous scientific papers and articles and held several patents on gas-core nuclear propulsion systems and related technologies. He is featured in the "Ashes and Atoms" documentary NASA produced about the Plum Brook Reactor. Rom was a member of several aviation and aerospace societies. After his retirement, he continued in the field and funded Rom-Aire Solar Corporation based on his patented designs.

Rom

Arthur H. Schultz 87, who retired in 1974 with 20 years of NASA service, died Nov. 24. Schultz was a U.S. Air Force veteran of World War II who joined the NACA/NASA workforce in 1954. He was a mechanical engineer who served primarily as a project engineer for several programs and the design of facilities. Schultz retired from the Wind Tunnel and Flight Division, but the bulk of his career was spent with the Facilities Operations and Maintenance Division. He also was an active member of the Speaker's Bureau.

Article Submissions

News items and brief announcements for publication in the February issue is noon, Jan. 18. Larger articles require at least one month notice.

READ US ON THE INTERNET:
http://aerospacefrontiers.grc.nasa.gov

Hermes Award 2009-2012

Calendar

IFPTE LOCAL 28, LESA MEETING: LESA will hold its next membership meeting on Wednesday, Feb. 13 at noon in the Employee Center's Small Dining Room.

National Aeronautics and Space Administration

John H. Glenn Research Center at Lewis Field
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www.nasa.gov

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 Community and Media Relations Office in the interest of the Glenn workforce, retirees, government officials, business leaders and the general public. View us online at *http://aerospacefrontiers.grc.nasa.gov*. Submit contributions via e-mail to the editor: doreen.b.zudell@nasa.gov or 216–433–5317.

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Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

GRC's Got Talent!

Continued from page 2

Congratulations to: Don Reames, WYLE/Logistics and Technical Information Division, for taking first place with his humourous violin medley of holiday songs; George Crawford, Counterintellegence and Counterintelligence, as the second place winner with his rendition of Garth Brooks' "The Thunder Rolls;" and the "Take 3" trio of Sylvia Merritt and Stephanie Brown-Houston, Educational Programs Office, and Dr. Dexter Johnson, Structural Systems Dynamic Branch, who garnered third place for their spirited version of "Miracle" by the gospel group The Clark Sisters.

The popular "NASA Jam Band" kept the event lively, which concluded with a social featuring light refreshments.

Pictured, clockwise from top: First place winner Reames • Second place winner Crawford • MC Foster • Employees pop up for Glenn's rendition of a Twelve Days of Christmas Flash Mob • Center Director Lugo jams with The NASA Jam Band • Santa joins in on the fun • Third place winners Merritt, Brown-Houston and Dr. Johnson.


C-2012-6139


C-2012-6131


C-2012-6134


C-2012-6108


C-2012-6145

C-2012-6160


C-2012-6152

Photos by Michelle Murphy

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 2 FEBRUARY 2013

Green Technology Set for Demonstration

Research Throttles Up Into Second Gear

NASA's Environmentally Responsible Aviation (ERA) Project has selected eight large-scale integrated technology demonstrations to advance aircraft concepts and technologies that will reduce the impact of aviation on the environment over the next 30 years. NASA Glenn is responsible for three of the eight technologies that will be demonstrated.

The ERA Project, created in 2009, is part of NASA's Aeronautics Research Mission Directorate's Integrated Systems Research Program. ERA's research portfolio is a healthy balance of industry and government partnerships working collaboratively to mature key technologies, often employing multidisciplinary computational engineering tools and methods in conjunction with integrated systems

Continued on page 3

C-2012-5932

Pictured: Pratt & Whitney geared turbofan installed in the 9- by 15-Foot Low Speed Wind Tunnel incorporates Glenn-developed propulsion technology that reduces fuel consumption.

Deputy Center Director Named

Robinson

NASA Glenn Center Director Jim Free has selected Gregory L. Robinson as the center's deputy director. Robinson, a native of Danville,Va.,is expected to report to his new position by March.

Robinson brings to Glenn nearly 30 years of engineering experience, including 6 years in the private sector, while the balance has been with NASA at varying levels of senior management. He was appointed NASA Deputy Chief Engineer in November 2005 and has been responsible for developing and implementing NASA's Engineering Excellence and Technical Authority across the agency.

All Aboard! NASA Glenn Technology Fuels RTA Bus

NASA Glenn's years of fuel cell research are helping to make traveling by bus a cleaner, quieter experience for Greater Cleveland Regional Transit Authority (RTA) passengers.

In 2009, Glenn began supporting a community-based partnership to establish a hydrogen fueling station and add a hydrogen-powered demonstration bus to the RTA fleet. This past fall, Glenn, working with subcontractor Sierra Lobo Inc., installed a refueling station located at RTA's Hayden bus garage in East Cleveland. The station, equipped with hydrogen sensors co-invented by Glenn's Dr. Gary Hunter and commercialized under a Small Business Technology Transfer contract, generates hydrogen from water for use as fuel for the city bus.

"What makes this project unique is that Glenn has installed the first electrolysis-based refueling station in Ohio," said Brianne Scheidegger, technical lead for the fueling station under the Space Power Systems Project. "This means we don't have to transport hydrogen tanks; we make the fuel onsite, which is safer and more cost effective."

Scheidegger explained that most buses run on diesel or gas-powered engines and emit the characteristic black plume of smoke when they accelerate from a stop. Fuel cell buses, however, are powered by an electric motor and use a fuel cell instead of a battery to generate the electricity. There is no smoke, just water emitted.

Continued on page 2

In This Issue

Partnership Boasts First Hydrogen Refueling Station in Ohio

The East Cleveland fueling station with bus.

Continued from page 1

On Jan. 22, RTA invited local media to learn more about the energy and environmental benefits of the hydrogen-powered bus. Glenn employees, who have worked on the project through the years, joined media on the bus to help educate the public on Glenn's role in fuel cell development.

"NASA Glenn has a long history of developing fuel cells and we want the public to understand how they can be used in an efficient and clean transportation system," says Dr. Carolyn Mercer, manager of the Space Power Systems Project in the Space Technology Game Changing Development Program. "The concept of a 'fuel cell' was around in the 1800s but when NASA developed a fuel cell for the Gemini program during the early days of space flight, it enabled the creation of a viable commercial market for fuel cells—yet another way that NASA technology creates jobs."

—By Nancy Smith Kilkenny and Doreen B. Zudell

Pictured are, left to right: Glenn's Dr. Valerie Lyons (retired), Dr. Robert (Joe) Shaw, Scheidegger and Dr. Mercer, who worked with RTA management on the project.

Project Reinforces Glenn's Fuel Cell Research

- NASA created today's fuel cell industry with the Gemini program in the 1960s.
- Glenn continues to innovate with award-winning non-flow-through fuel cell technology.
- Glenn collaborates closely with industry to create jobs in the United States.

Suggestion Improves Efficiency, Saves Money

Employees realize their ideas count through the Employee Suggestion Program.

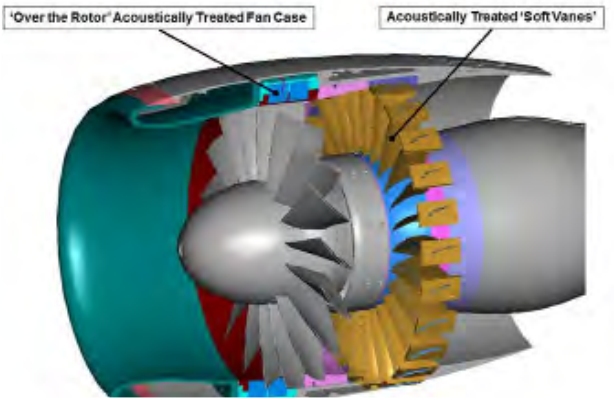
During a shutdown of a cooling tower, city water is used to maintain water service to the center's institutional chillers. Large volumes of water is passed through the chillers and discharged into the storm sewer and not recirculated (known as "once-thru cooling"). While shutdowns are required to perform routine maintenance, the process is costly—soaking up thousands of dollars in domestic water costs. Art Hugo, an engineer in the Engineering Management Branch, suggested an alternative approach to this costly method.

Hugo proposed the center rent mobile cooling towers to perform the task. Cooling towers and pumps are attached to chiller equipment through temporary piping. Despite an initial investment to design and install the infrastructure to support the mobile units and the rental equipment, the center saved $1,250,476 in water fees and nearly 400 million gallons of water during a 2-month shutdown. Additional savings is expected in 2013 and the outlying years.

Hugo is one of several employees whose ideas were recently adopted under the Employee Suggestion Program. The program allows cash awards, up to $7500, paid to employees who submit suggestions that directly improve efficiency, economy and/or effective execution of government operations. To learn tips and guidelines for submitting ideas, contact Harvey Schabes, 3-5309.

Pictured: A mobile cooling tower with piping Inset photo: Hugo.

Environmentally Friendly Technology



This cutaway image illustrates a Pratt & Whitney Advanced Ducted Propulsor fan model. It was used to validate Glenn's work on first generation acoustically-treated parts to reduce engine noise.

Continued from page 1

analysis to aggressively pursue fuel burn, noise and emission reductions goals for tomorrow's transport aircraft. Each of the demonstrations, which are scheduled to begin this year and continue through 2015, is expected to include selected industry partners, many of which will contribute their own funding.

The demonstrations will focus on five areas: aircraft drag reduction through innovative flow control concepts; weight reduction from advanced composite materials; fuel and noise reduction from advanced engines; emissions reductions from improved engine combustors and fuel consumption; and community noise reduction through innovative airframe and engine integration designs.

"With these demonstrations we will take what we've learned and move from the laboratory to more flight and ground technology tests," said Fay Collier, ERA project manager based at NASA Langley. "We have made a lot of progress, but the real challenge is to integrate ideas and pieces together to make an even larger improvement."

ERA is one of many NASA aeronautics research efforts to develop technologies to make aircraft safer, faster and more efficient and to help transform the national air transportation system. Research is being conducted at several NASA centers. To view the complete list of breakthrough technologies, visit www.nasa.gov/centers/glenn/news/pressrel/2013/13-002_throttles.html.

Glenn's Technologies To Be Demonstrated

- **Highly Loaded Front Block Compressor Demonstration**: Tests to demonstrate the enabling technologies required to achieve higher pressure ratio and thermal efficiency of core engines for reduced fuel consumption.
- **2nd Generation Ultra High Bypass Ratio Propulsor Integration**: Continued development of a geared turbofan engine to help reduce fuel consumption and noise.
- **Low Nitrogen Oxide Fuel Flexible Engine Combustor Integration**: Demonstration of a full ring-shaped engine combustor that produces very low emissions.

Exploring Extreme Sustainable Solutions

Since October, 24 students, ranging from 14 to 20 years old, have been immersed in activities designed to help them become responsible and innovative caretakers of the environment. They are members of the newest addition to the NASA Glenn Exploring Project, Post 634/eXtreme Green, which is participating in a variety of projects related to the next-generation green laboratory.

The Exploring Project is a collaboration of NASA Glenn's Educational Programs Office and the Boy Scouts of America, providing students exposure to Glenn-specific research and technology activities, while inspiring interest in science, technology, engineering and mathematics (STEM) careers.

"Each week, students participate in roundtable discussions and monitor the Big 6 metrics—pH (hydrogen ions), temperature, oxygen, phosphate, nitrate, true specific gravity and electrical conductive properties—for their own portable green-lab systems set up in Glenn's GreenLab," explained Dr. Bilal Bomani, GreenLab Research Facility manager and Post 634 advisor. "We're concentrating on finding alternative, renewable and sustainable solutions for self-sustainable renewable energy ecosystems."

Dr. Bomani, second from right, guides students in constructing a portable greenlab ecosystem.

Over the next few months, students will conduct biofuel, biomass and alternative energy optimization experiments, as well as analyze eXtreme green data, to potentially be used in Glenn's world-class laboratory and published in a NASA Technical Memorandum.

In addition to Bomani, Henry Fain, Energy Systems Branch; Bethany Gigante, a co-op in the Energy and Environmental Management Office; and Glenn retiree Dr. Valerie Lyons, mentor eXtreme Green Post participants.

—By S. Jenise Veris

C-2012-5990 Photo by Marvin Smith

Local Coast Guard Connection ˆ

Officers in the United States 9th Coast Guard District visited the center on Nov. 26 to learn how NASA Glenn overcomes challenges, motivates its staff and achieves inclusion among its workers using innovation and creativity methods. Presentations by several senior managers, one-on-one discussions and facility tours helped establish new relationships and connections between the Coast Guard and NASA Glenn.

Building Anticipation ˇ

The 2013 Buckeye Regional FIRST Robotics Competition Kickoff was held on Jan. 12 at the Cuyahoga Community College Unified Technologies Center. More than 150 local students, teachers and volunteers from 24 Northeast Ohio high school teams attended the kickoff, which revealed the new game, "Ultimate Ascent." Each team received an identical kit of parts to begin an aggressive design-build of their own robot. For more information on FIRST (For the Inspiration and Recognition of Science and Technology) Robotics and the Buckeye Regional competition, March 28–30, visit http://www.oai.org/firstbuckeye/index.html.

PBS Helps With On–the–Job Training ›

High school students in the culinary arts program at EHOVE Career Center in Milan, Ohio, recently showcased their skills by providing lunch for sale at Plum Brook Station (PBS). The buffet-like menu items, offered at PBS a few times a year, help the students gain experience cooking for and serving to the public. Pictured is EHOVE student Hannan Smith with Rick Sorge, test program manager in the Space Power Facility. Miss the opportunity to enjoy the cuisine? Culinary arts students will return for an encore on April 16 and Oct. 16.

Photo by Larry Opper

C-2012-6406 Photos by Michelle Murphy

CFC Chili Champions ˇ

On Dec. 11, the Combined Federal Campaign (CFC) Chili Cook-Off proved to be an overwhelming success! Thanks to the generosity of 19 employee chili chefs, patrons and volunteers, Glenn raised $742 for the CFC Undesignated Fund in a matter of 90 minutes. The Cook-Off winners include: pictured far left, left to right: Judge's Choice Award—Jim Free's Two-Vote Chili; People's Choice Award—Anna Falcon's Jackpot Chili; and Showmanship Award—Nicole Smith and Trudy Kortes's Chili Con Cuties. Left: employees sampling the entries.

C-2012-6404

Buildings Adhere to Energy–Efficient Design Standard

Modern building construction includes much more than stability and comfort. NASA Glenn employees can be confident that new buildings constructed at the center are energy efficient and use environmentally friendly materials according to LEED (Leadership in Energy and Environmental Design) certification standards.

Developed by the U.S. Green Building Council in 2000, LEED provides a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. LEED for New Construction addresses design and construction activities for both new buildings and major renovations of existing buildings, which includes major heating, ventilation, and air-conditioning (HVAC) systems improvements, significant building modifications and major interior rehabilitation.

C-2011-4979 Photo by Marvin Smith

The new Main Gate is LEED-certified Gold, boasting a number of "green" features.

Efficient and Effective

An internationally recognized mark of excellence, LEED certification provides independent third-party verification that a building was designed and built using strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selections and indoor environmental quality.

"Upfront planning for green operations and maintenance can help ensure that a building performs to its full potential," Project Management Branch Chief John Selby said. "LEED certification standards help lay the foundation for sustainable operations and maintenance practices once the project has been completed."

Significant Savings

Selby said the energy model design for the Centralized Office Building was developed to LEED standards and predicts a 30 percent decrease in energy use compared to a standard new office building. He estimates that compared to existing Glenn office buildings, the energy costs per square foot of building area for the Centralized Office Building will be less than half, saving more than $100,000 annually.

In addition, several Lewis Field buildings, including the Guerin Management Center, Main Gate and Business Service Center (bldg. 60), hold LEED certification, and the new warehouse (bldg. 351) completed last year in the Lewis Field West Area is expected to receive certification soon. The Shipping and Receiving Facility (SARF), now under construction at Lewis Field and scheduled to open this year, has been designed to LEED standards. At Plum Brook Station, the Space Power Facility, which is planned for major renovations this year, is designed for LEED certification. The new Main Gate project at Plum Brook Station, also planned for construction starting in 2013, is designed to be LEED certified.

Future LEED-certified buildings in the early planning stages include a major expansion to the Building 351 Warehouse and a new 90,000-square-foot Research Support Building, the second major office building in Lewis Fields's central campus. All new buildings are designed to employ high-performing energy systems and advanced metering concepts.

"Most of the center's buildings were never metered, making it impossible for us to accurately measure and trend energy usage," Selby explained. "Our LEED-certified buildings, however, will allow us to track our energy usage and make adjustments when necessary. This will result in significant reductions in our maintenance and operations budget for these buildings."

—By Doreen B. Zudell

Socialize with Glenn

Join thousands of people who are connecting to Glenn through these social media sites:

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http://www.facebook.com/NASAGlenn

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YouTube
http://www.youtube.com/nasaglenn

Employees Crucial to Investigation Team

Space Flight Awareness Award

C-2013-109 Photo by Michelle Murphy

Pictured with the award, left to right: Melis, Meriwether, Lewis and Duane Revilock, another member of the Glenn sub team.

During fueling of the final flight of Discovery/STS-133, NASA technicians discovered a crack in the intertank foam of the shuttle's external tank. After removing the foam from that location, they discovered longitudinal cracks in the intertank stringers. This launched a major investigation.

Marvin Meriwether and **Sharon Lewis**, SGT/Logistics and Technical Information Division, provided mission-critical support to the External Tank Stringer Investigation Team assembled to assess the cause and resolve the problem so that STS-133 could fly safely.

On Jan. 15, NASA Glenn recognized Meriwether and Lewis for their efforts by bestowing on them a Space Flight Awareness (SFA) Team Award for their exceptional and dedicated mission-critical support to the investigation. Matt Melis, Structures and Dynamics Branch and a member of the investigation team assembled in sub teams across the agency, submitted the nomination and presented the award.

"Marvin and Sharon helped bring organization to chaos. They worked efficiently and effectively to ensure the equipment and materials we needed at Kennedy Space Center arrived on time so we could conduct a tanking test on the space shuttle launch pad. Their timeliness was key to the success of our efforts." Melis said. "The investigation was a true team effort, and Marvin and Sharon played a critical role in Glenn's contributions to the team."

— By S. Jenise Veris

Retirements

Dr. Chamis

Dr. Seng

Dr. Christos C. Chamis, Research and Technology Directorate, retired Oct. 13, 2012, with 46 years of federal service, including 44 with NASA.

Dr. Valerie J. Lyons, Power and In-Space Propulsion Division, Research and Technology Directorate, retired Jan. 3, 2013, with 37 years with NASA.

Dr. Gary T. Seng, Communications, Instrumentation and Controls Division, Research and Technology Directorate, retired Feb. 1, 2013, with 34 1/2 years of NASA service.

In Appreciation

My wife Loretta and I would like to sincerely thank our many NASA Glenn friends and colleagues who offered kind words of sympathy and support after the recent passing of Loretta's father, Frank Romanoski, Sr. Your thoughts and prayers meant more to us than words can express. —Joe and Loretta Shaw

William Camperchioli has been selected chief of Space Combustion and Materials Branch in the Testing Division, Facilities and Test Directorate. Camperchioli has progressively advanced over his 25-year career at NASA Glenn. He most recently served as the Space Simulation Facility Manager responsible for managing the center's research and development space simulation ground test facilities.

Camperchioli

Dr. Malcolm Stanford, Tribology and Mechanical Components Branch, was honored as a Modern-Day Technology Leader during the Black Engineer of the Year (BEYA) STEM Global Competitiveness Conference held Feb. 7 to 9. Stanford leads NASA Glenn's development of novel superelastic materials for corrosion-proof, damage-tolerant mechanical components. The event was hosted by Lockheed Martin Corporation, The Council of HBCU Engineering Deans, *US Black Engineer & Information Technology* magazine, and sponsored by Aerotek.

Dr. Stanford

Allen Turner has been selected the new Emergency Preparedness Manager for the Office of Protective Services (OPS). Turner joins the OPS staff from the United States Coast Guard (USCG), where he served as both a commissioned officer and a civil servant. Most recently, Allen served as a subject matter expert and program manager for the USCG emergency planning and preparedness efforts within the Great Lakes area.

Turner

In Memory


Friedman

Robert Friedman, 83, who retired in 2000 with 48 years of NASA service, died December 7, 2012. Friedman was a scientist and internationally known expert in combustion and spacecraft fire safety. He made significant contributions to analytical and experimental microgravity-combustion research that was recognized as having great potential for spacecraft and terrestrial applications. Friedman's work aided the development of models and data for the prediction of material flammability for improved insulation, fire protection, more sensitive smoke detection and ultimately improved aircraft and spacecraft design. His contributions were the foundation of NASA Glenn's critical role in the agency's spacecraft fire safety strategy, a legacy that continues today.

Frank Holt, 87, who retired in 1980 with 38 ½ years of federal service, died Dec. 10, 2012. At 16, Holt was the youngest hire at NACA's new Aircraft Engine Research Laboratory in Cleveland in February 1942. He was among a small group of talented high school students, along with local technicians, hired to create scaled models of facilities and test articles for wind tunnels. Holt helped build a scaled version of the Prop House, the laboratory's first test facility, before enlisting in the Air Corps on his 18th birthday. He subsequently served as a mechanic on a B-29 aircraft during World War II and returned to the lab in 1946 to continue working as a mechanic in the Test Installations Division on various aerospace projects as NACA transitioned to NASA. He worked primarily in the wind tunnels on notable projects under the Crash Fire Test program and the V/STOL (vertical/short takeoff and landing) program.


Holt

Wilbur (Bud) F. Wolfe, 84, who retired in 1982, died Nov. 23, 2012. Wolfe joined the NACA-NASA workforce as an electrical apprentice in 1947. During his 35-year career with the agency, he held progressively responsible positions, which enabled him to practice his trade in nearly every research facility. Prior to retiring, Wolfe served as head of the Electrical Power Distribution Office overseeing a staff of power dispatchers who controlled and monitored the center's entire electrical power system. He also administered the center's contract with the Cleveland Electric Illuminating Company for the purchase of more than $3 million dollars of additional electric power annually. Wolfe served on the center's Federal Energy Conservation and Electrical Power Reduction Committees and was a member of the Technical Service Division's Supervisor's Club.


Wolfe

Article Submissions

News items and brief announcements for publication in the March issue is noon, Feb. 15. Larger articles require at least one month notice.

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http://aerospacefrontiers.grc.nasa.gov

Hermes Award 2009-2012

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Emergency and Inclement Weather Lines

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

February 20 is John Glenn Friendship 7 Day in Ohio

Calendar

IFPTE LOCAL 28, LESA MEETING: LESA will hold its next membership meeting on Wednesday, Feb. 13 at noon in the Employee Center's Small Dining Room.

GRC CONNECTIONS: The next GRC CONNECTIONS forum will be held Feb. 21 from 10 to 10:45 a.m. in the Briefing Center.

RETIRED NASA WOMEN'S LUNCHEON: The next NASA Retired Women's Luncheon will be Thursday, Feb. 21 at noon at the 100th Bomb Group on Brookpark Rd. Contact Gerry Ziemba, 330-273-4850, to reserve your place.

BLACK HISTORY MONTH: Glenn's Black History Month Observance event, featuring guest speaker Ohio State Senator Nina Turner, will be held Feb. 28, from 10 a.m. to noon in the Administration Building Auditorium. POC: Lynda Glover, 3-2463

Call for Summer Intern Mentors

Glenn's Educational Programs Office is looking for employees who can serve as mentors for the Glenn High School Internship Project (GHIP). The 8-week paid internship runs from June 17 to Aug. 9, 2013. Thirty mentors are needed to support high school sophomores and juniors. Employees interested in becoming a mentor for this program must post opportunities for student(s) in the One Stop Shopping Initiative (OSSI) at http://intern.nasa.gov through Feb. 13, 2013. You must begin your opportunity title with "GHIP". Intern funding will be secured for all GHIP mentors. POC: Giovanna Mignosa, 216-433-2894. For information on the internship, visit http://www.nasa.gov/centers/glenn/education/GlennHighSchoolIntership.html.

National Aeronautics and Space Administration

John H. Glenn Research Center at Lewis Field
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Cleveland, Ohio 44135
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Managing Editor: **Kelly R. DiFrancesco**

Young Astronauts Day 20th Anniversary

What's it like to be an astronaut?

Each year, students in Ohio gain a glimpse into the skills needed to be an astronaut during NASA Glenn's Young Astronauts Day (YAD). In November 2012, YAD celebrated its 20th anniversary.

YAD annually attracts hundreds of students, representing schools, clubs and scouting troops throughout Ohio, who travel to NASA Glenn to test their skills on a number of competitive engineering and scientific activities related to a NASA mission. They work in groups designated Pilots (grades 1 through 6) or Commanders (grades 7 through 12.

NASA and the Northern Ohio Section of the American Institute of Aeronautics and Astronautics (AIAA) cosponsor this annual event initiated by Dr. Colin Drummond, a former aerospace engineer in NASA Glenn's Aeronautics Directorate. In 1992, while serving as chairman of that AIAA section comprised largely of NASA employees, Drummond proposed leveraging resources to conduct an educational outreach project in math and science.

MaryJo Long-Davis, chief of NASA Glenn's Inlet and Nozzle Branch and an AIAA member, who has coordinated the event for many years, said the success of this long-running program is largely due to the dedication of AIAA and NASA Glenn volunteers.

"A lot of planning and hard work goes into the program," she explained, "yet we've successfully hosted an average of 300 students each year with no reduction in participation by volunteers."

To emphasize this fact, Long-Davis cited how Ryan Edwards, a NASA employee at Plum Brook Station and former YAD student, is now following in his parents footsteps. Karen and Daryl Edwards are 15-year YAD veteran volunteers who recently retired from Glenn.

Photos by Karen Edwards

Pictured, top: astronaut Greg Johnson greeting parents and students; and above, students participating in the 20th anniversary activities in the Glenn Hangar.

Glenn's Exploration Flight and Development Project Office and the AIAA Northern Ohio Section sponsored YAD's 20th anniversary activities, with the support of Glenn's Educational Programs Office. Astronaut and former Associate Director of External Programs Gregory H. Johnson fulfilled a YAD tradition of helping kickoff the day's activities.

"The popularity of this annual event, and the enthusiasm of the students who experience it, proves the next generation of scientists, engineers and explorers is eager and up to the challenge," Long-Davis said.

—By S. Jenise Veris

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 3 MARCH 2013

New Center Director Shares Leadership Philosophy and Goals

Jim Free Addresses Employees

"I'm honored to have this job," said Jim Free during his first All Hands meeting as Center Director Feb. 12. "I care about the people who work here and I'm committed to each of you and making us [NASA Glenn] successful."

During the All Hands address at Lewis Field, which aired live at Plum Brook Station, Free shared his leadership philosophies and short-term priorities. He noted among those priorities since taking the helm in January, he has selected his deputy director, conducted this All Hands meeting with employees and submitted recommendations on Glenn's role within the agency to NASA's Total Capabilities Assessment Team.

C-2013-304 Photo by Bridget Caswell

Pictured: Free and Pietravoia, front, hold "The Best Place to Work in the Federal Government" plaque during the All Hands meeting as employees cheer in the background. Seated, front, right, is new Deputy Director Robinson and his wife.

NASA Earns "The Best Place to Work in the Federal Government" Award

Additional priorities on Free's list include: continuing to grow external partnerships and new business, addressing budget shortfalls in fiscal year 2014 and the out years and refining the center reorganization model by the June–July timeframe.

Free said the center reorganization will occur with some slight modifications from the original model. He indicated that there is still time for employee input.

He introduced his new Deputy Director Gregory L. Robinson and his wife, Cynthia, who were visiting the center and getting to know the Cleveland area.

Robinson, who previously served as NASA's deputy chief engineer, expressed his desire to quickly get into the Glenn workplace to meet employees. He is expected to be onboard this month.

With the assistance of Lori Pietravoia, director of Glenn's Office of Human Capital Management, Free presented a plaque from the Partnership for Public Service to employees signifying NASA as "The Best Place to Work in the Federal Government" among large agencies. The rankings draw on responses from nearly 70,000 civil servants to produce a detailed view of employee satisfaction and commitment across 362 federal agencies and subcomponents.

Free concluded the meeting with questions from employees.

—By Doreen B. Zudell

Astronaut Suni Williams Shares Mission Highlights

C-2013-334

Sunita "Suni" Williams, the first Ohio astronaut to command the International Space Station, visited NASA Glenn and the Great Lakes Science Center.

See page 3.

In This Issue

NASA's Plum Brook Station Reaches 50–Year Milestone

Fifty years ago on March 15, 1963, NASA officially purchased 6,031 acres of land that is known today as NASA Glenn Research Center's Plum Brook Station.

C-1963-63844

Center Director Abe Silverstein, right, and Army Corps of Engineers James Bailey review papers accepting Plum Brook Station.

50 Years: How We've Grown

- 1941—War Department purchased 6,031 acres of private land for the Plum Brook Ordnance Works.
- March 1, 1956—NACA received permit to use 500 acres for the reactor.
- March 1, 1958—NACA received permit to use additional 2,712 acres for Rocket Systems Laboratory giving a total of 3,180.
- March 15, 1963—3,180 acres previously held under permit officially transferred to NASA as well as the 2,800-acre bunker area that would be used for Space Power Facility; NASA owned a total of 6,031 acres.
- 1967–71—NASA purchased 2,000 acres of land along its perimeter for a buffer zone but allowed previous owners to continue using the land for agriculture.
- 1977–89—1,600 acres of the buffer zone properties were sold back to original owners.
- Today—Plum Brook consists of 6,432 acres.

Source: NASA Glenn History Office

Suggestion Improves Efficiency, Saves Money

Employees realize their ideas count through the Employee Suggestion Program

The ingenuity of Jon Mitchell, a Sierra Lobo employee working as a research laboratory mechanic in the Aviation Environments Technical Branch, recently helped the center solve a costly dilemma.

Replacing worn fasteners (bolts and locknuts) in the Engine Research Laboratory's test cell CE–18 costs thousands of dollars due to the quality of the fasteners. However, Mitchell discovered discarded fasteners in another test cell that appeared to be the right fit for CE–18, while on the lookout for other test cell materials. Instead of disposing of the fasteners, Mitchell switched them for the worn fasteners in test cell CE–18.

Photo by Doreen B. Zudell

Mitchell by fasteners inside test cell CE–18.

Mitchell's initiative saved the center more than $18,000 to replace the fasteners. The money saved also enabled technicians to extend the testing season to accommodate additional tests, including performance testing of the state-of-the art centrifugal compressor stage under the High-Efficiency Centrifugal Compressor Program.

Mitchell is one of several employees whose ideas were recently adopted under the Employee Suggestion Program. The program allows cash awards, up to $7500, paid to employees who submit suggestions that directly improve efficiency, economy and/or effective execution of government operations. To learn tips and guidelines for submitting ideas, contact Harvey Schabes, 3–5309.

—By Doreen B. Zudell

FIRST Robotics *Comes to Town* March 28–30

The 12th Annual Buckeye Regional FIRST Robotics Competition will be held March 28–30 at Cleveland State University's Wolstein Center in downtown Cleveland. Over 50 high school teams and 1,275 students will participate in this year's FIRST (For the Inspiration and Recognition of Science and Technology) competition, which will feature the 2013 game "Ultimate Ascent."

Would you like to be a part of the action? Volunteers are still needed! To register, visit: http://www.oai.org/firstbuckeye/volunteers.html by Friday, March 22.

Astronaut Suni Williams Shares Mission Highlights in Cleveland

Visits Lewis Field and Great Lakes Science Center

NASA astronaut and Euclid, Ohio, native Sunita "Suni" Williams visited Cleveland on Feb. 15 and 16 to excite and engage audiences of all ages in several activities at NASA Glenn and the Great Lakes Science Center.

Williams began her visit with an Expedition 32/33 Mission Briefing for Glenn employees in the Administration Building Auditorium at Lewis Field. She shared some of her experiences during her tour—July to November 2012—onboard the International Space Station. Williams conducted research on five experiments developed by Glenn and performed an in-space triathlon that included running on a treadmill while using an improved harness developed at Glenn's Exercise Countermeasures Laboratory (ECL).

Williams said the highlight of her mission was the three spacewalks she performed with crewmate Akihiko Hoshide of the Japan Aerospace Exploration Agency (JAXA) to repair several critical elements of the space complex, including a radiator. Despite its complex nature, Williams has come to think of the space station, now completed and fitted with all its creature comforts and state-of-the art technology, as a vacation home away from Earth.

She wrapped up her presentation by answering employees' questions and signing autographs.

After the mission briefing, Williams traveled to Glenn's Space Experiments Laboratory where she met with the principal investigators and researchers of five Glenn-developed experiments—InSPACE-3, BASS, BCAT-5, FLEX and SAMS—for science reviews and lessons-learned discussions. She also visited the ECL.

The next day Williams joined NASA Glenn, in partnership with the Great Lakes Science Center, in a tribute to commemorate the maiden flight of Friendship 7. The Ohio Senate passed a bill last year designating Feb. 20 as the annual observance of John Glenn Friendship 7 Day, to salute the Ohio astronaut who was America's first man to orbit the Earth in 1962.

Thousands of visitors packed the Great Lakes Science Center, home of the NASA Glenn Visitor Center, for the space-themed programming. As the featured speaker, Williams highlighted her Expedition 32/33 mission, which afforded her the honor of being the first Ohio astronaut to command the International Space Station.

After the presentation, she talked with audience members and signed autographs. One of the young attendees, Katie Cochran from Aurora, expressed her gratitude and excitement about meeting an astronaut and obtaining an autograph.

"Every night I stare at the stars with hope that someday soon I will visit space," Cochran said. "I really do dream of becoming a NASA astronaut, and events like this inspire me to realize it's really possible."

—By S. Jenise Veris

C-2013-328

Williams at Lewis Field: (1) briefing Glenn employees (2) reviewing future plans for the ECL (3) attending Science Reviews.
Activities at GLSC: (4) Education booths demonstrating space suit cooling system and (5) simulating Mars rover landing on Xbox. (6)Williams with Cochran.

C-2013-396

C-2013-373

Photos by Michelle Murphy and Stephen Sanderson

News and Events

New Home Page Features ›

Want to learn more about what's happening at NASA Glenn? The Web Portal team has added several user-friendly features to its home page. When you log onto http://www.nasa.gov/centers/glenn/home/index.html you'll see the live Twitter Feed on the right side, a scrolling box of our latest feature stories, current events updates and featured images. Check it out!

C-2013-249 Photo by Michelle Murphy

‹ Day of Remembrance

Astronaut Doug Wheelock, pictured left, joined the Glenn staff for the NASA Day of Remembrance on Jan. 31. Led by Associate Director Janet Watkins, employees paused to remember our fallen heroes of the Apollo 1, Challenger and Columbia crews, as well as all other members of the NASA family who lost their lives furthering the cause of exploration and discovery. Following Wheelock's touching tribute to each crew member, Matt Melis, Structures and Dynamics Branch, recognized the 10th anniversary of the Columbia accident by sharing his analysis and testing work for the Columbia Accident Investigation and NASA's Return to Flight programs.

Striving for MLK's Dream of Equality ›

Nearly half a century after Dr. Martin Luther King's "I Have a Dream" speech, the sobering reality is that the color of a person's skin can still tip the scales of justice, according to Dr. Ronnie Dunn, pictured right, in his keynote address at Glenn's 2013 Martin Luther King Equality Ceremony Jan. 23. Dunn, an associate professor of Urban Studies at Cleveland State University, shared the results of a study commissioned by the Cuyahoga County Prosecutor's Office examining traffic ticketing distribution data for patterns of "racial profiling" to address and improve processes and procedures that ensure equality for all.

C-2013-208 Photo by Bridget Caswell

Photo by Janice Haas

‹ High-Tech Educational Webinar

Susan Kohler, an aerospace education specialist in NASA Glenn's Educational Programs Office, conducted a national educational webinar on remote sensing live from the Great Lakes Science Center on Dec. 18. Kohler, pictured left, engaged her audience using Science on a Sphere (SOS), a high-tech visual aid composed of computers and video projectors to display animated data on the outside of a 6-foot sphere suspended in air. The event was broadcast with the help of Dave Mazza, Video Learning Center, and in collaboration with Janice Haas and Jesse Terry, supporting the Space Communications and Navigation Program at NASA Glenn, and the Great Lakes Science Center.

Plum Brook Testing Helps Scientific Balloon Set Records

Up, Up and Way to Go Glenn!

Last summer, engineers and technicians in the Spacecraft Propulsion Research Facility (B-2) at Plum Brook Station performed testing to verify the functionability and survivability of payload components for a large NASA balloon borne instrument known as the Super Trans-Iron Galactic Element Recorder (Super-TIGER). The balloon recently broke two flight duration records while flying over Antarctica carrying an instrument that detected 50 million cosmic rays.

The instrument, a structure jammed with electronics (and hitched to the huge atmospheric balloon) was designed to measure rare elements heavier than iron among the flux of high-energy cosmic rays bombarding the Earth from elsewhere in our Milky Way galaxy. Testing in the B-2 chamber involved simulating various low-pressures and high-temperatures the payload would encounter in the environment of the upper atmosphere. The instrument gathered so much data that it will take scientists two years to analyze fully.

—By Doreen B. Zudell

Photo courtesy of NASA

Early testing of payload components at Plum Brook helped ensure a successful outcome in Antarctica.

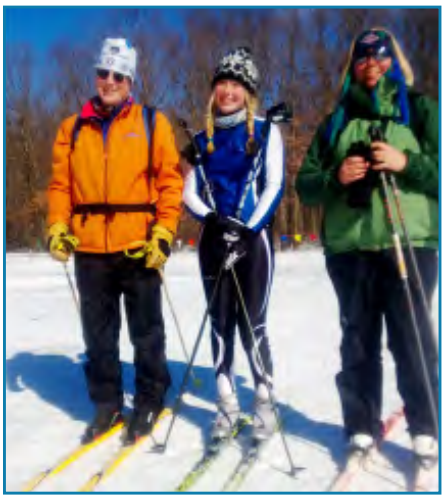
Elonen-Wright Coaches International Ski Team

Lewis Ski Club Members Compete in Russia

Skiing is a passion for Lewis Ski Club member Linda Elonen-Wright, chief of the Facility Management Planning Office. Earlier this month, she had an opportunity to share her love for the recreational sport as a coach for the 6th Winter International Children's Games (ICG) in Ufa, Russia.

Elonen-Wright, her husband, Jim Wright, daughter, Gwen, and fellow Lewis Ski Club members, Sears and Henley Shultz, participated in the ICG. They traveled to Russia with eight other local athletes, ages 12 to 15, as Team Cleveland, and competed in the categories of Nordic (cross country) and alpine (downhill) skiing, ski orienteering and ski-cross.

Elonen-Wright and her husband have been members of the family friendly Lewis Ski Club since she began her career at the center 30 years ago. She recently completed the Community Coaching Course program of Cross Country Ontario in Georgian Bay, Canada. In December, Elonen-Wright was asked to support Team Cleveland by helping to coach at the ICG. The fact that her husband and daughter were already competing made it a family affair.



Jim and Linda with daughter Gwen, during practice for Team Cleveland Nordic skiers.

"Participating in the ICG was a fabulous opportunity for the kids because it's like a junior Olympics—with an opening ceremony and parade into a stadium. For skiers from Cleveland, this may be as close to the real Olympics as they'll ever get," Elonen-Wright reflected. "We're grateful to the Lewis Ski Club for their encouragement and support of Team Cleveland's fundraising activities, which helped to make it possible!"

—By S. Jenise Veris

Saturday Tours Begin in April

Invite your family and friends to come out to NASA Glenn this summer. The center will offer free tours of its world-class facilities at Lewis Field one Saturday a month from April through October.

A tour bus will depart from Lewis Field's main gate every hour beginning at 10 a.m., with the last tour departing at 1 p.m. One-hour tours begin in the Briefing Center Auditorium and include a multimedia presentation on Glenn.

The 2013 Saturday tours premier April 6, and will highlight the Simulated Lunar Operations (SLOPE) facility where researchers are improving the mobility of rovers on the moon.

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.

Awards, Honors and Promotions

SCaN Testbed Managers Recognized

Two Glenn employees recently received Space Flight Awareness (SFA) awards for their contributions to mission success related to the Space Communications and Navigation Program (SCaN).

NASA photo

Astronaut Shane Kimbrough, left, and Greg Williams, deputy associate administrator of the Human Exploration and Operations Mission Directorate, present Johnson's award.

Sandra Johnson, Digital Communications and Navigation Branch, was invited to NASA's Kennedy Space Center, January 28–30, for an event highlighted by the SCaN Program TDRS–K (communications satellite) launch. Johnson, who served as deputy principal investigator for the SCaN Testbed, received a SFA Honoree Award and certificate for outstanding leadership and technical achievements "behind the scenes" that were instrumental to supporting prelaunch communications testing and planning post-launch experiments.

C-2013-115 Photo by Marvin Smith

Wheelock presents Silver Snoopy Award to Kiefer.

Astronaut Douglas Wheelock made a surprise visit to **Dwayne Kiefer**, VPL/Systems Verification and Operations Branch, Jan. 18, to present a SFA Silver Snoopy Award, reserved for astronauts to express appreciation for an individual's or group's contribution to ensure mission success. Kiefer was recognized for exemplary dedication, technical excellence and leadership as the manager of external interfaces for the SCaN Testbed Project. His efforts resulted in flawless execution of the Japanese Aerospace Exploration Agency's ground processing and successful integration of the SCaN Testbed with the launch vehicle in Japan.

— By S. Jenise Veris

In Appreciation

We want to express our sincere appreciation for all of the expressions of sympathy and condolences received from our NASA friends, families and coworkers. The support, flowers, cards and memorial contributions reflect the depth of sorrow shared across the NASA community over the loss of our son. We are proud to be a part of such a caring community and will find comfort and strength in the days ahead knowing that our family is in the thoughts and prayers of many.

—John & Kathy Schubert

I would like to thank everyone who donated leave or offered prayers during my time of need. I'm really grateful for all the kindnesses. It reminds me we're a NASA family!

—Colleen Davis-Pearson

Following my heart attack on January 27, many of you reached out to me with prayers or words of encouragement through e-mails, cards, texts and phone calls. To say that I have been humbled by your generosity and support is an understatement. I feel very blessed to be part of an outstanding team of people at Glenn Research Center and I'm grateful to be able to call many of you friends. I'm back to work and feeling stronger every day. Please accept my most sincere thanks for every act of kindness on my behalf!

—Tim Ruffner

The Business of Federal Technology has selected **Anthony Facca**, chief of Glenn's Integration Office, Office of Chief Information Officer, as a 2013 Federal 100 award recipient. The awards recognize government and industry leaders who have played pivotal roles—above and beyond their daily responsibilities—in federal government IT. Facca was recognized for his groundbreaking efforts in establishing a program to develop hardware, software and security configuration standards that have been applied to over 65,000 computer systems throughout 10 NASA centers.

Facca

Dr. Anita Tenteris-Noebe has been selected chief of the Reliability and System Safety Engineering Branch in the Program and Project Assurance Division. Tenteris–Noebe previously served as the Materials and Processes Lead for the Multipurpose Crew Vehicle Service Module. In addition, she worked as the Risk Management subject matter expert responsible for technically managing and leading project teams for the center's risk management effort within the Safety and Mission Assurance directorate.

Dr. Tenteris-Noebe

Retirements

Roundtree

Valerie Roundtree, Space Combustion and Materials Branch, Facilities and Test Directorate, retired Feb. 2, 2013, with 33 1/2 years of NASA service.

Emergency and Inclement Weather Lines

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

In Memory

Laurence W. Gertsma, 81, who retired from NASA in 1994 with 30 years of service, died Jan. 18. Gertsma was a U.S. Army veteran and mechanical engineer who contributed to NASA's aircraft propulsion systems research. He performed propulsion research for vertical and/or short take-off and landing (V/STOL) aircraft, critical to the designs and specifications suggested by manufacturers of supersonic aircraft airframes and engines. Gertsma authored/coauthored numerous technical reports and was the feasibility program manager for the Heat Pipe Radiation Cooling (HPRC) for the High-Speed Aircraft Propulsion program.

Carl L. Hembly, 96, who retired in 1979 with 20 years of NASA service, died Jan. 19. A World War II Army Air Corp veteran, Hembly came to NASA as a journeyman sheet metal model maker in the Fabrication Division. He was a member of the Hangar crew who modified an F-106 jet for a series of test flight conditions and airplane speeds analyzing "boattail drag," a concern when a plane's speed approaches Mach 1. Hembly is survived by daughters Cheryl Brodka, SGT/Logistics & Technical Information Division; Suzanne Hembly a retiree from the Supply Management Branch; and Meg Sajewski.

Hembly

Erwin M. Lauffer, 95, who retired in 1984 with 23 years of NASA service, died Jan. 8. Lauffer was an architect who came to NASA in 1962 after serving in the U.S. Navy Construction Battalion and private practice with his father. He tenured his career in the Architectural Design Section of NASA Lewis' Facilities Engineering Division, and became chief of the section. He was the project architect for the Design Engineering Building (DEB) and DEB Annex.

Lauffer

Robert R. Metroka, 83, who retired in 1989 with 29 years of NASA service, died Jan. 13. Metroka was a U.S. Marine Korean War veteran who joined NASA as a metallurgist in the Materials & Structures Division. He helped design the center's Hot Isostatic Press Facility, analyzed alternative materials for NASA's COSAM (Conservation of Strategic Aerospace Materials) program aimed at reducing U.S. dependency on strategic materials and supported the design and operation of the Atlas-Centaur launch vehicle for launching the Navy FLTSATCOM-8 communications satellite.

Metroka

Article Submissions

News items and brief announcements for publication in the April issue is noon, March 22. Larger articles require at least one month notice.

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http://aerospacefrontiers.grc.nasa.gov

Hermes Award 2009-2012

2010 APEX AWARDS FOR PUBLICATION EXCELLENCE

Yuri's Night

Join the party at our Visitor Center on April 13. Early bird tickets are on sale through March 18.

Visit greatscience.com for details.

Calendar

IFPTE LOCAL 28, LESA MEETING: LESA will hold its next membership meeting on Wednesday, March 13 at noon in the Employee Center's Small Dining Room.

GRC CONNECTIONS: The next GRC CONNECTIONS forum will be held March 21 from 10 to 10:45 a.m. in the Briefing Center.

WOMEN'S HISTORY MONTH: Glenn's Women's History Month Observance event, featuring guest speaker Tim Daley, director of speakers for the Sailors and Soldiers Monument, will be held March 21, from 11:30 a.m. to 1:30 p.m. in the Administration Building Auditorium. POC: Karin Bozak, 3-6621.

BOOK FAIR IN CAFE: Come visit the New Books Are Fun Fair in the Lewis Field Cafe, building 15, from 10 a.m. to 2 p.m., March 26 and 27. The event offers a wide selection of books, music and educational products. POC: Connie Carroll, 3-5535

LUNCH WITH THE DIRECTOR OF: Lori Pietravoia, chief of Glenn'S Office of Human Capital Management, will host the next Lunch with the Director Of March 27 from noon to 1 p.m. in the Small Dining Room, building 15.

EARTHFEST 2013: Join the center at EarthFest 2013, Sunday, April 21, 10 a.m. to 5 p.m. at the Cuyahoga County Fairgrounds. This year's theme is Celebrating Advanced and Renewable Energy. NASA Glenn is participating with the Greater Cleveland Regional Transit Authority to showcase the hydrogen-powered bus, the first electrolysis-based refueling station in Ohio.

Exchange Online Gift Shop

www.nasagiftsshop.com

Injured Wildlife Safety Precautions

Do you know what to do when an injured animal comes into view? If the animal is seriously injured, please call Security and report the incident so it can be handled by the proper authorities.

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National Aeronautics and Space Administration

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21000 Brookpark Road
Cleveland, Ohio 44135
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Managing Editor: **Kelly R. DiFrancesco**

NASA Glenn Employees Gave Generously—Again

Center Exceeds CFC 2012 Goal!

NASA Glenn concluded another successful Combined Federal Campaign (CFC) year, exceeding the 2012 CFC goal of $416,000 by 9 percent and raising the total to $453,381!

At Glenn's CFC Recognition Program Jan. 28, Center Director Jim Free thanked employees for their hard work and generosity and proudly announced his honor to assume leadership for the 2013 North Coast CFC. As chairman, Free will lead the 40 North Coast counties—37 in Ohio and 3 in Pennsylvania—in promoting the convenience and importance of employee support to their local charitable organizations through the CFC program.

C-2013-218 Photo by Bridget Caswell

Pictured, left to right: Mills and Glenn CFC Co-Chair Terri McKay present Glenn's contributions check to McClain and Johnson from the North Coast Combined Federal Campaign.

Free joined North Coast CFC Director Carol McClain and Campaign Coordinator Steve Johnson in presenting certificates of appreciation to directorate chairpersons represented on Glenn's CFC Committee and the network of nearly 100 keyworkers.

The program also included a presentation of plaques to Bernadette (Sue) Puleo, Research & Technology Directorate for Directorate Chairperson of the Year and to Laura Bagnell, a recent retiree from the Logistics and Technical Information Division, for Keyworker of the Year. Bob Grossman was awarded a special Lifetime Achievement Award for 35 years of dedicated service as Glenn's CFC financial manager.

Glenn 2012 CFC Chairperson Anne Mills noted the successful combination of traditional fundraising favorites and new events, such as Face the Pie and the Chili Cookoff. These activities not only garnered monetary support but also boosted employee morale.

"The time and effort expended by this year's CFC Committee to coordinate all the special events, on top of making the campaign run smoothly, went above and beyond my expectations," Mills attested. "I am so grateful for everyone's positive attitude and infectious 'can do' spirit that contributed to our success."

To view photos of the 2012 CFC campaign, visit http://cfc.grc.nasa.gov/.

—By S. Jenise Veris

FC 2012 Facts

- Campaign Goal: $416,000
- Campaign Total: $453,381
- Special Events: $11,669
- Centerwide Participation: 41%
- Space Flight Systems Directorate Participation: 61%
- Office of Chief Counsel Participation: 100%

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 4 APRIL 2013

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

Continued on page 2

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

Continued on page 2

In This Issue

Test Facility

Continued from page 1

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

C-2012-4163 Photo by Quentin Schwinn

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

Hall of Fame

Continued from page 1

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 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

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.

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.

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 ˇ

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 ˇ

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

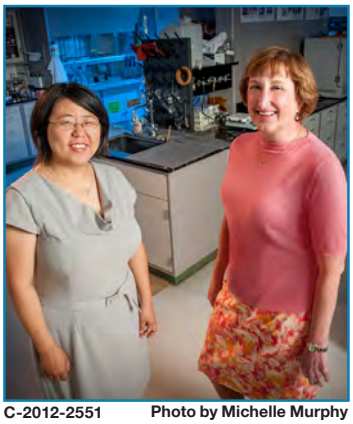
Beginning in May 2013, all NASA GS employees and their supervisors will begin using a new automated tool to conduct the performance management process. The Standard Performance Appraisal Communication Environment (SPACE) is a performance management tool developed by NASA that automates NASA's Employee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

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.

C-2013-806 Photo by Bridget Caswell

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

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.

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

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.

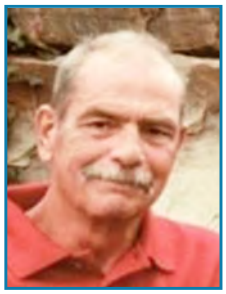
Retirements

Dukes-Campbell

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

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 lighthearted 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

2010 APEX AWARDS FOR PUBLICATION EXCELLENCE

Emergency and Inclement Weather Lines

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

Calendar

lational 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

John H. Glenn Research Center at Lewis Field
21000 Brookpark Road
Cleveland, Ohio 44135
www.nasa.gov

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Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

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

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 5 MAY 2013

SCaN Testbed Checks Out! Experiments Begin

Glenn Technology On Space Station

The Space Communications and Navigation (SCaN) Testbed has successfully begun its experiments after completing its checkout on the International Space Station.

Designed and developed at NASA Glenn, the testbed is an advanced communications laboratory facility that was installed on space station. Using a new generation of Software Defined Radio (SDR) technologies, the testbed allows researchers to develop, test and demonstrate advanced communications, networking and navigation technologies in the dynamic space environment.

Checkout activities ensured the payload safely made it through launch and installation and established its status and health, including the antenna systems and the as-launched software on each of three SDRs.

Preparations were made for experiment operations during commissioning. The testbed is now performing

Continued on page 2

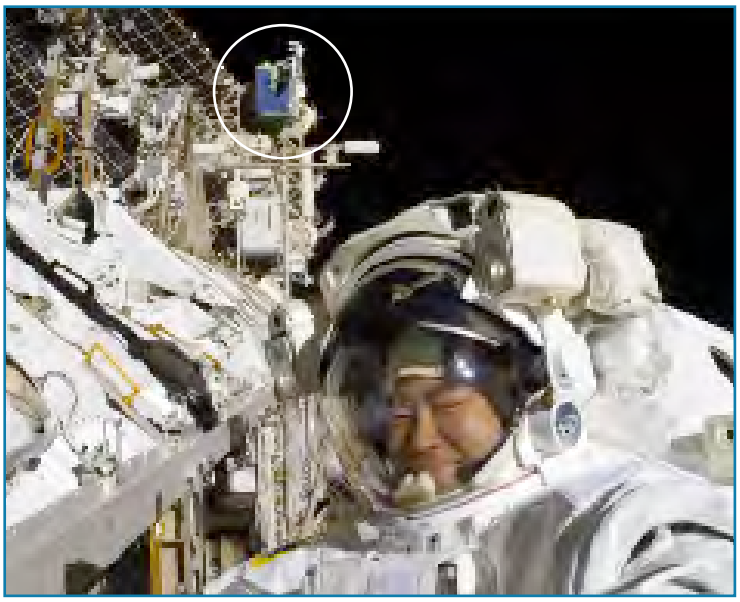

Photo courtesy of NASA

The SCaN is pictured (circled) on the ISS. Japan Aerospace Exploration Agency astronaut Akihiko Hoshide is conducting the spacewalk.

Seven Glenn Employees Earn Federal Executive Board Awards

Wings of Excellence

The Cleveland Federal Executive Board honored seven Glenn employees with a Wings of Excellence Award during the Federal Employees Recognition and Awards Program Luncheon, May 10. The award recognizes nominees from federal agencies across Northern Ohio for their outstanding service and contributions of significance to a major project, national program or the enrichment of a community. Congratulations to the following Glenn honorees:

Charles Doxley, Avionics Systems Branch, for mentoring skills that inspired middle-school-aged students on the For Inspiration and Recognition of Science and Technology (FIRST) Lego League (FLL) team from Olivet Institutional Baptist Church. Based on the student nominations, Doxley received the 2012 Mentor Award at the Northeast Ohio Regional FLL Robotics Alliance. The FLL supports a national goal to improve student learning in science, technology, engineering and mathematics (STEM).

Karin Huth, chief, Research and Space Operations Branch, for outstanding support to the Communications, Navigation and Networking Reconfigurable Testbed (CoNNeCT) and High Ice Water Content (HIWC) programs. Huth negotiated contracts for these major programs with excellence, in addition to her normal supervisory responsibilities and despite staff reductions, demonstrating a model of exceptional dedication, initiative and performance.

Continued on page 2

In This Issue

FEB Awards

Continued from page 1

Dr. Ruth Jones, NASA Safety Center's Mishap Investigation Support Office, for significant contributions to three agency investigations that required rapid intervention and assistance, as well as an extended temporary duty at Marshall Space Flight Center to complete one of the investigations within the 75-day requirement. Jones is also a mentor for the Youth Motivation Task Force at the University of Arkansas (Pine Bluff), that offers students assistance transitioning to a professional environment.

Jennifer Jordan, Electron and Opto-Electronic Devices Branch, for technical expertise that has brought NASA Glenn recognition for world-class research and development of high-temperature wireless electronics for monitoring aircraft engine health, as well as design/analysis of hybrid radiofrequency (RF)/optical communication systems for future space exploration. Jordan is also cited for her commitment as a mentor and recruiter for NASA Co-op/Internship Programs, career fairs and participation in a variety of charitable events.

Doxley

Huth

Dr. Jones

Jordan

Kilkenny

Miller

Tirone

Mark Kilkenny, Strategic Integration and Project Control Office, for creativity and excellence in performing a wide variety of analyses regarding Glenn customer satisfaction and research contributions, and metrics developed for business effectiveness and efficiency. He is also recognized for his engaging presence at many charitable events in and outside of the center.

Richard Miller, SAIC/Safety and Health Division, for outstanding contributions to NASA Glenn workplace health and safety. His in-depth knowledge of occupational health and safety regulations has not only enabled Miller to anticipate and identify hazards, but also educate workers and provide alternative methods for accomplishing workplace safety.

Doris Tirone, Human Capital Consultant Division, for mentoring veterans and people with disabilities as lead for NASA Glenn's pilot program to recruit formerly homeless veterans. Her efforts enabled Glenn to surpass 2012 agency goals with the highest rate of veterans hired and/or disabled. Tirone is a noted blogger on Govloop.gov, consistently communicating advice to veterans.

SCaN Testbed

Continued from page 1

on-orbit experiments. These initial experiments include advancements in S-band and Ka-band SDR technology to a mature technology readiness level, making existing communications paths, especially in the Ka-band, even more capable than in the past.

Additionally, an experiment with NASA's latest Tracking and Data Relay Satellite (TDRS-K) will be the first in-orbit test and demonstration of a TDRS spacecraft acquiring and successfully autotracking a Ka-band user in Low Earth Orbit.

"SCaN Testbed represents a significant advancement in SDRs and their applications for NASA," said Project Manager David Irimies, Space Communications Office. "Investigating these SDR technologies in the dynamic space environment increases their technology readiness level and maturity, which, in turn can be used for future missions as risk reduction."

The Testbed will help technology developers and mission planners understand how SDRs will be used in future missions. It is expected to operate on-orbit on station for up to six years.

For more information about the SCaN Testbed, visit: http://spaceflightsystems.grc.nasa.gov/SOPO/SCO/SCaNTestbed/.

SCaN Testbed Timeline

Oct. 2007	Glenn begins SCaN Testbed development
Feb. 13, 2012	SCaN Testbed shipped from Lewis Field to Tanegashima, Japan (JAXA) in anticipation of launch
July 21, 2012	SCaN Testbed launches from Tanegashima, Japan
July 27, 2012	Japanese H-II Transfer Vehicle delivers SCaN Testbed to space station
Aug. 7, 2012	SCaN Testbed successfully installed on space station
Aug. 13, 2012	SCaN Testbed successfully activated on space station
Feb. 15, 2013	SCaN checkout operations complete

NASA Begins Flight Research Campaign Using Alternative Jet Fuel

Quantifying Benefits of Renewable Fuels

NASA researchers recently completed a series of flights using the agency's DC-8 flying laboratory to study the effects of using biofuel on engine performance, emissions and aircraft-generated contrails at cruise altitudes.

The Alternative Fuel Effects on Contrails and Cruise Emissions (ACCESS) research involved flying the DC-8 as high as 39,000 feet while an instrumented NASA Falcon HU-25 aircraft trails behind at distances ranging from about 300 feet to 10 miles.

"We believe this study will improve our understanding of the effects of alternative fuels on aircraft engine emissions at cruise altitudes as well as study their effects on contrail properties and quantify potential benefits of renewable alternate fuels in terms of aviation's impact on the environment," said Ruben Del Rosario, manager of NASA's Fixed Wing Project at Glenn.

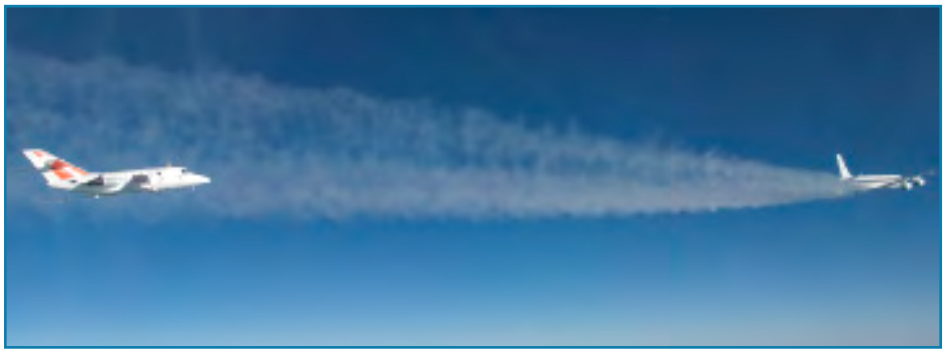

Photo courtesy of NASA Dryden

Pictured, left, is the Falcon jet in the DC-8's downstream exhaust plume during testing.

ACCESS flight operations were staged from NASA's Dryden Aircraft Operations Facility in Palmdale, Calif., and took place within restricted airspace over Edwards Air Force Base, California. During the flights, the DC-8's CFM56 engines were powered by conventional JP-8 jet fuel, or a 50-50 blend of JP-8 and an alternative fuel of hydroprocessed esters and fatty acids produced from oil derived from camelina plants.

More than a dozen instruments mounted on the Falcon jet characterized the soot, gaseous emissions and contrail properties streaming from the DC-8, and monitored changes in these properties as the exhaust stream mixed with ambient air and aged downstream of the engine.

ACCESS follows a pair of Alternative Aviation Fuel Experiment studies conducted in 2009 and 2011 in which similar but more extensive instruments measured the exhaust emissions from the same DC-8 engines as the aircraft burned various alternative fuels while parked on the ramp at the Palmdale facility.

A second phase of ACCESS flights is planned for 2014. It will capitalize on the results obtained from the 2013 flights and may include additional measurements or fuels.

The ACCESS study is a joint project involving researchers at NASA's Dryden, Glenn and Langley research centers.

The Fixed Wing Project within the Fundamental Aeronautics Program of NASA's Aeronautics Research Mission Directorate manages ACCESS.

Morton Arboretum Partners with Glenn

Technology Used in Tree Failure Research

Tree failure has caused billions of dollars in damage to buildings and the infrastructure of utilities. Understanding how trees fail under the strains of extreme weather—hurricanes, ice and snow loads—is critical for arborists as they work with businesses to find solutions to reduce damage.

Photo by Matt Melis

NASA Glenn engineer Matt Melis, Structures and Dynamics Branch, is partnering with researchers at the Morton Arboretum (near Chicago) to demonstrate how stereo photogrammetry technology— technology he used during the Space Shuttle Columbia accident investigation—can enlighten arborists on the biomechanics of tree failure.

Visit the NASA Glenn Web Portal to read how: www.nasa.gov/centers/glenn/technology/morton_tree.html.

Research trees were whitewashed and black dots were applied so computer-imaging equipment could capture the stress points as the tree was pulled by a winch.

Celebrating Women's Past and Present Contributions ˇ

During NASA Glenn's Women's History Month Observance celebrating "Women Inspiring Innovation Through Imagination," March 22, NASA Glenn Associate Director Janet Watkins touted NASA's status as one of the nation's largest employers of women in STEM careers. In the welcoming remarks, she highlighted some of those talented women across the agency.

C-2013-1155 Photo by Bridget Caswell

Watkins, left, and Acting Director of Engineering Tom Hartline, right, with guest speaker Daley.

Griebel

Zakrajsek

The featured speaker, Tim Daley, executive director of the Soldiers' and Sailors' Monument, extolled the heroics and innovative fundraising of local women in the Northern Ohio Branch of the U.S. Sanitary Commission and their impact during the American Civil War.

Following Daley's presentation, this year's Federal Women's Program award recipients were recognized for their outstanding contributions to the advancement and inspiration of women at Glenn and in the community. Therese Griebel, chief, Avionics and Electrical Systems Division, is this year's supervisor honoree. June Zakrajsek, program planning and assessment manager of the Radioisotope Power Systems Program, is the nonsupervisor recipient.

Glenn Kicks Off Earth Day, Sustainability Events, EarthFest 2013 ˇ

The center's Green Earth Committee kicked off its 2013 *Greening NASA Glenn One Event at a Time* season April 18 at Lewis Field. Director of the Facilities and Test Directorate Dr. Rickey Shyne, who serves as Glenn's Sustainability officer, opened the event by affirming his commitment to "green" practices and sharing examples of how "green is a way of living" at NASA Glenn. Committee members then gave brief descriptions of the series of environmental awareness events planned at Lewis Field and Plum Brook Station through November.

Pictured right: Dr. Shyne gives Dogwood seedlings to Jim Lucic and Kelly Shankland, Publishing Services, during the Greening Glenn One Event at a Time kickoff. Pictured below: Kirsten Duffy, Structure and Dynamics Branch, conducts a Flywheel interactive demonstration at EarthFest 2013.

C-2013-1466 Photo by Michelle Murphy

One of those first activities included NASA Glenn's presence at EarthFest 2013, Ohio's largest environmental education event held at the Cuyahoga County Fairgrounds, April 21. Visitors enjoyed the "Journey to Tomorrow" trailer filled with interactive activities and displays, along with the inflatable space shuttle and EVA, the astronaut, that were prominently displayed at the entry gate. Glenn volunteers and Extreme Green Explorer Post 634 members greeted a steady flow of visitors circling NASA demonstrations on alternative energy technology solutions, including wind and water turbines, flywheels and fuel cells. Guests also enjoyed the "Picture Yourself…" photo booth, inflatable Mars rover and literature handouts.

Photo by Mack Thomas

New Visitor Center Galleries Unveiled ˇ

Above: Glenn's Deputy Director Robinson, second from left, helped pierce ceremonial hydrogen balloons with GLSC representatives at the unveiling. Right: Guests try manipulating a glove box experiment in one of the new interactive displays.

Photos courtesy of Babulski Productions

Glenn Deputy Director Gregory Robinson joined the Great Lakes Science Center's (GLSC) new president Kirsten Ellenhogen and Board Chairman Paul Dolan in offering welcoming remarks to guests and media attending the April 4 unveiling of the newly renovated NASA Glenn Visitor Center galleries. The galleries highlight the challenges of living and working in space and Glenn's role in research to prepare for journeys farther in space. These are the first three galleries of the redesigned Visitor Center, with two new galleries coming this summer. Retired astronaut and Cleveland native Don Thomas made a special appearance, April 6, for GLSC's "Space Saturday" activities and public grand opening.

Glenn Supports Another Great FIRST Robotics Season ˇ

More than 130 NASA Glenn employees volunteered to make the 12th annual FIRST Buckeye Regional Robotics Competition a roaring success. Fifty-three teams and more than 1300 students with their mentors, teachers, parents and friends converged on Cleveland State University Wolstein Center, March 27 to 30. They cheered on the engineering and robotics prowess of robots created to meet the game challenge "Ultimate Ascent."

Glenn continues to be a primary sponsor of the Buckeye Regional, one of 77 FIRST regionals across the country. This year the center sponsored 14 of the 30 Ohio teams participating, including rookie award winners: North Olmsted High School Eagles, for Rookie Inspiration Award; and Olentangy Local Schools' O-Zone, for Highest Rookie Seed and Rookie All Star. Several other Ohio teams earned honors for imagery, competitive play, creativity and teamwork.

In addition to winning the General Motors Industrial Design Award, Plum Brook's home team, The Mavericks from EHOVE Career Center, was part of the winning alliance that won the Buckeye Regional competition (view the final match at https://www.youtube.com/watch?v=TIxhL2HGrEw) and the right to advance to the FIRST Robotics Competition Championship in St. Louis, Missouri. The Mavericks also competed well in the Pittsburgh Regional, March 16–18, making it to the semifinal round elimination and winning the Innovation in Controls Award.

Team 639, Ithaca (NY) High School's robot, displays its scoring prowess—rapidly firing discs into the scoreboard—to claim a place on the 2013 Buckeye Regional FIRST Robotics Competition winning alliance.

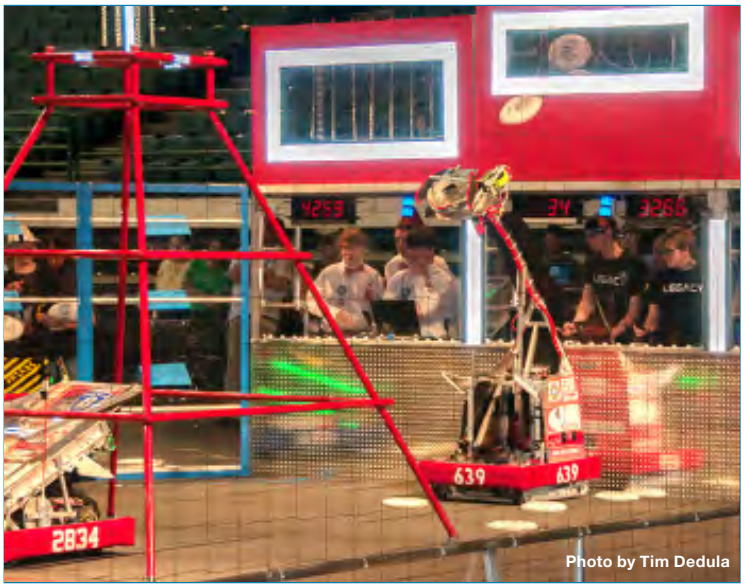

Photo by Tim Dedula

Larry Oberle, Diagnostics and Data Systems Branch, received the regional's Woodie Flowers "Mentor Award." A FIRST mentor since 1995, Oberle currently partners with the Youth Technology Academy team. Volunteer of the Year was presented to Ann Heyward, OAI vice president of Research and Educational Programs and Buckeye Regional Planning Committee chairperson for the past 10 years.

Awards, Honors and Promotions

Nancy Hall has been selected Fluids Multiphase Flow project manager within the Space Operations Project Office. She previously served as project manager for the Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions-3 and Shear History Extensional Rheology Experiment investigations.

Hall

Dr. Moss

Dr. Antoine Moss has been selected transportation officer and mail manager in the Logistics and Technical Information Division, Center Operations Directorate. Moss brings to the position some unique work experience and education as a federal intern, in addition to competencies developed most recently as a logistics management specialist.

Dr. Sutter

The Society for the Advancement of Material and Process Engineering (SAMPE) has named **Dr. James Sutter** among the 2013 class of fellows. Sutter is an organic/polymer chemist in Glenn's Polymers Branch, Materials & Structures Division, who also serves the NASA Engineering Safety Center as a senior research polymer scientist and project manager for polymer composites. His research focuses on applications for large composite spacecraft structures, composite pressure vessels, and high-temperature polymers for advanced aircraft and hypersonic engines.

Retirements

David Brinker, Icing Branch, Research & Technology Directorate, retired April 30 with 32 years of NASA service.

David Lamar, Space Communications Office, Space Flight Systems Directorate, retired Sept. 20, 2012, with 23 years of NASA service.

Calendar

GRC CONNECTIONS: The next GRC CONNECTIONS forum is Thursday, May 16, from 10 to 10:45 a.m. in the Briefing Center Auditorium.

RETIRED NASA WOMEN'S LUNCHEON: The next NASA Retired Women's Luncheon is 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.

Sustainability Events

Eco-painting and Environmental Initiatives for Your Home: May 16, noon to 1 p.m., building 15, Small Dining Room. POC: Sue Puleo, 3-6654

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

ASIAN-PACIFIC AMERICAN HERITAGE: The center's annual Asian-Pacific American Heritage Observance will be Wednesday, May 22, 10 a.m. to noon, in the Administration Building Auditorium.

LUNCH WITH THE DIRECTOR OF: The next Lunch with the Director Of is Wednesday, May 22, noon to 1 p.m. in the Small Dining Room, building 15.

MEMORIAL DAY OBSERVANCE: Glenn's Veterans Awareness Committee will host a Memorial Day ceremony, Friday, May 24, noon, at the flag pole in front of the Administration Building. (The backup, in case of rain, is the Briefing Center.)

BPW SCHOLARSHIP: The Glenn Business and Professional Women's (BPW) organization is accepting applications for its annual Career Advancement Scholarship. The $500 scholarship is open to all women at Glenn and used toward tuition/expenses for the 2013-14 academic year. The application deadline is Friday, May 24. POC: Jill Noble, 3-3711.

JUNE PUBLIC TOUR: The next Saturday tour, June 1, will highlight the 8-by 6-Foot Supersonic Wind Tunnel. 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 host its next membership meeting on Wednesday, June 12 at noon in the Employee Center's Small Dining Room.

Father's Day is June 16

Choose from a variety of gift ideas: Polo shirts, hats, sunglasses or beach towels for the warm weather; and laptop bags, Fisher Space Pens, Apollo and space shuttle medallions, as well as patches and pins for the NASA memorabilia collector.

Exchange Online Gift Shop
www.nasagiftshop.com

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

In Memory

Romero Demonstrated Skill and Commitment

Noel Romero, 51, a Sierra Lobo, Inc. (SLI) employee supporting NASA Glenn as a welder and research laboratory mechanic for more than 20 years, died April 13.

Romero

Throughout his career at the center, Romero earned several awards for expertise in welding intricate assemblies and structures used for facility and research applications, including the more difficult weld assemblies during fabrication of the "tuna can" sections for the ARES 1–X. More recently, as a member of the Space Power and Technical Propulsion Branch, Romero's welding expertise proved invaluable in fabricating a large test stand needed in the Tank 6 vacuum chamber. He also used his skills to repair "robotic warriors" in the NASA-sponsored mobile machine shop in support of the FIRST Robotics Competitions.

"Noel especially enjoyed working with young people and helping to keep their robots running during the FIRST competitions," said SLI Supervisor Jeff Smith. "He will always be remembered as a loyal, hard working person who truly took pride in supporting NASA Glenn."

Romero's brother, Robert Romero, works in Glenn's Venture Development and Partnerships Office.

Welcome New Additions to the NASA Family

C-2013-889

Pictured above, left to right: Jennings, Varis and Vyhnalek. Pictured right, below, left to right: Webb, Hartwig and Gallagher.

The center welcomed the following new employees during the month of March: **Rochelle Gallagher**, Human Capital Development Division; **Jason Hartwig**, Propulsion and Propellants Branch; **Frank Jennings**, Community and Media Relations Office; **William Varis**, Institutional Services Branch; **Brian Vyhnalek**, Antenna and Optical Systems Branch; and **Courtney Webb**, Human Capital Development Division.

C-2013-1194 Photos by Bridget Caswell

Billy Harrison, 89, who retired in 1978 with 35 years of NACA/NASA service, died Feb. 10. Harrison was a graduate of the first NASA Lewis Apprentice class. He began his career as a mechanic and became chief of the Test Installation Division (TID) in 1966. He earned a NASA Exceptional Service Medal. Harrison was named associate director of Technical Services in 1970, a position he held prior to retirement along with his division chief responsibilities. His brother, Richard, a NASA retiree who also served in TID, survives him.

Harrison

William (Bill) E. McKissock, 83, who retired in 1987 with 35 years of federal service, died March 7. A U.S. Army veteran, McKissock began working at NACA-NASA in 1958. He spent his entire NASA career in the Engineering Design Division, where earlier, he performed mechanical design of numerous aeronautic projects and space research experiments—from propeller acoustic test rigs and models for wind tunnel testing to cryogenic fluid management and acceleration equipment in the Zero-G Facility. Later, he became chief of Engineering Support and received the NASA Exceptional Service Medal. McKissock's son, David, and daughter-in law, Barbara, work in the Power Systems Engineering Branch.

McKissock

Article Submissions

News items and brief announcements for publication in the June issue is noon, May 24. Larger articles require at least one month notice.

READ US ON THE INTERNET:
http://aerospacefrontiers.grc.nasa.gov

Hermes Award 2009-2012

2010 APEX AWARDS FOR PUBLICATION EXCELLENCE

Get Social with NASA Glenn!

NASA 2012 SPINOFF MAGAZINE: The 2012 NASA Spinoffs magazine highlights NASA-sponsored research and technology that has been transferred to the private sector. To view the online version, visit http://www.sti.nasa.gov/tto/Spinoff2012/index.html.

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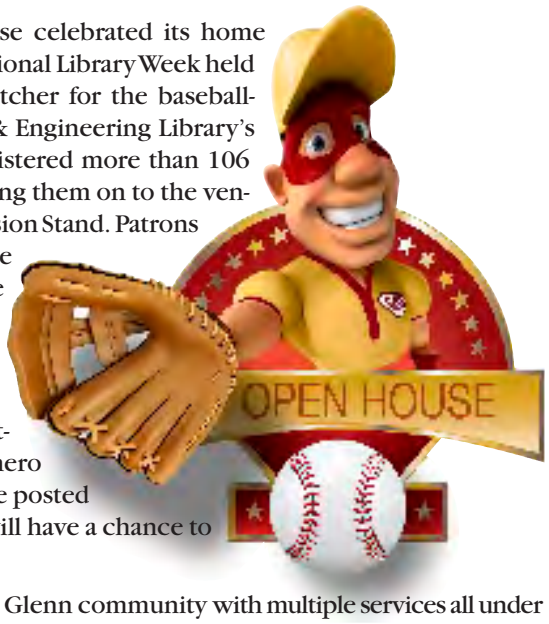
Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

Batter Up! Library Commons Event Hits a Home Run

The Library Commons Open House celebrated its home opener, April 23, on the heels of National Library Week held April 14–20. The Opening Day pitcher for the baseball-themed event was Glenn Science & Engineering Library's Kate Dunlap, who greeted and registered more than 106 patrons for door prizes before waving them on to the vendor giveaways table and the Concession Stand. Patrons enjoyed popcorn and peanuts before rounding the bases (areas) where they tagged up with team reps who pitched brief descriptions of the Library Commons services.



Some great suggestions were submitted for renaming the library superhero contest. The top three names will be posted on *Today@Glenn* and employees will have a chance to vote for their favorite.

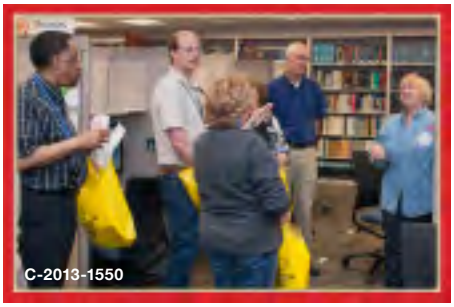
The Library Commons provides the Glenn community with multiple services all under one roof. Whether it's research help, professional training and development, assistance with archives or managing records, facilitating social media—or even using a more creative method to move forward with a project or solve a problem—the Library Commons can help you hit a home run!

Written by S. Jenise Veris, Graphics by Lisa Liuzzo and Photos by Michelle Murphy

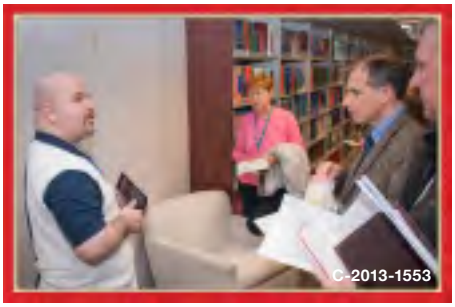
Anne Mills, left, defends Third Base/ Records Management & Archives.

Alan Montroso, second from right, fielded Shortstop/Special Projects.

Head Librarian Kate Dunlap, right, on the Pitcher's Mound/Registration.



Annette Rostetter, right, played First Base/Learning Center.



Second Baseman Don Reams, left, covered Library Social Media.

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 6 JUNE 2013

Headquarters Staff Visit Lewis Field, Plum Brook Station

Deputy Administrator Touts Glenn

During a visit to Lewis Field and Plum Brook Station, May 16, NASA Deputy Administrator Lori Garver shared her excitement and support for NASA Glenn's role in advancing technologies to benefit the nation. Garver affirmed how the President's $17.7 million 2014 budget request keeps the agency on track for fulfilling ambitious goals.

"We [NASA] drive technology not just to do it," Garver said. "It is driven by the taxpayers best value on their dollars."

Garver stressed the value of NASA's work, with a focus on Glenn's contributions, during her All Hands address to employees. Accompanied

Continued on page 2

C-2013-1910 Photo by Marvin Smith

Daniel Herman, Space Propulsion Branch, right, briefs Dr. Gazarik, left, and Garver on solar electric propulsion research, a key enabling technology for the proposed Asteroid Retrieval Mission.

C-2013-1877 Photo by Marvin Smith

Shin Presents Awards

Associate Administrator of Aeronautics Research Mission Directorate Dr. Jaiwon Shin thanked employees for their contributions to aeronautics research and presented his personal awards during his recent visit. Shin, left, and Glenn Deputy Director Greg Robinson, are pictured with Dr. Brenda Henderson, Acoustics Branch. She received a Strategic Partnership Individual Award for her work as the NASA lead on a jet noise research program with the Office of Naval Research.

See Shin's visit highlights on page 2.

In This Issue

Glenn Provides Critical Testing for Flight Readiness

The Orion Multi-Purpose Crew Vehicle (MPCV) will travel farther into space than any human spacecraft has gone in more than 40 years—and Glenn will be a part of it! The center is coupling its engineering expertise and world-class facilities to address crucial technological issues relating to flight readiness for the MPCV's Exploration Flight Test–1 (EFT–1), which is scheduled for late 2014.

The MPCV spacecraft includes a crew module and service module, a spacecraft adaptor and a launch abort system to significantly increase crew safety. Orion

Continued on page 3

Focus on Aeronautics: Dr. Shin Hosts All Hands, Awards Ceremony

"NASA technology is the DNA of modern aircraft," affirmed Associate Administrator for the Aeronautics Research Mission Directorate (ARMD) Dr. Jaiwon Shin. "You would be hard-pressed to find a system that does not have NASA technology."

Shin, accompanied by Robert Pearce, director of Strategy, Architecture and Analysis, visited Lewis Field, May 16, to brief employees and senior staff on aeronautics accomplishments and challenges and present awards for outstanding work.

—By Doreen B. Zudell

2012 ARMD AA Award Recipients

Strategic Partnerships Individual Award: Dr. Brenda Henderson, Research & Technology Directorate

Program and Mission Support Group Award—ARMD Outreach Team: Tom Benson, Research & Technology Directorate; Dr. Ruben DelRosario, Aeronautics Research Office; and John Oldenburg, Facilities and Test Directorate

Honorable Mention
Strategic Partnerships (Individual): James Griner, Research & Technology Directorate

Program and Mission Support (Group Award): Michael Oliver, team lead, Research & Technology Directorate

For the entire list of awards with explanations, visit http://www.aeronautics.nasa.gov/aa_awards.htm

C-2013-1838 Photo by Quentin Schwinn

Dr. Shin, top, left, meets with Glenn's senior leadership during his visit.

C-2013-1879 Photo by Marvin Smith

Dr. Shin and Deputy Director Robinson flank ARMD Outreach Team award recipients Dr. DelRosario and Oldenburg. Not pictured: Benson.

Deputy Garver

Continued from page 1

by Associate Administrator of the Space Technology Missions Directorate Dr. Michael Gazarik, Garver carried this message throughout the visit, which included facility tours and media briefings.

Gazarik, who was named to head the new mission directorate last November, shared the excitement and addressed some of the challenges associated with deep space exploration. He said his mission directorate is looking at various types of propulsion to achieve faster ways to get there, and sees Glenn as "the center of solving deep space mission challenges."

—By Doreen B. Zudell

Pictured right: Plum Brook's Brian Willis describes a prototype of a power drive unit and universal mounting plate designed by a team of seniors in the Norwalk High School's Pathway to Engineering program.

C-2013-1893

Left to right: Garver, Dr. Gazarik, Dr. Shin and Glenn Director Jim Free answer employee questions during the All Hands.

C-2013-1925

C-2013-1940 Photos by Marvin Smith

Garver stresses the value of commercial partnerships amidst the backdrop of the SpaceX fairing in the Space Power Facility.

Glenn Researcher Earns Prestigious NASA Recognition

Competes in NASA Invention of the Year Contest

Dr. Nguyen

Dr. Quang-Viet Nguyen, formerly in Glenn's Space Environment and Experiments Branch, received runner up in NASA's Government Invention of the Year competition for his "Fully-Premixed Low-Emissions High-Pressure Multi-Fuel Burner" (LEW-17786-1) technology. Nguyen, who is currently program executive for the Science Mission Directorate Deep Space Climate Observatory and Polar Free Flyer projects at Headquarters, invented a low-emission, multi-fuel burner that works with Raman scattering techniques to diagnose flame conditions inside the ultra-high-pressure combustion chambers of next-generation advanced aircraft engines. The Inventions and Contributions Board annually recognizes a best entry for the Government and the Commercial Invention of the Year.

Flight Readiness Testing

Continued from page 1

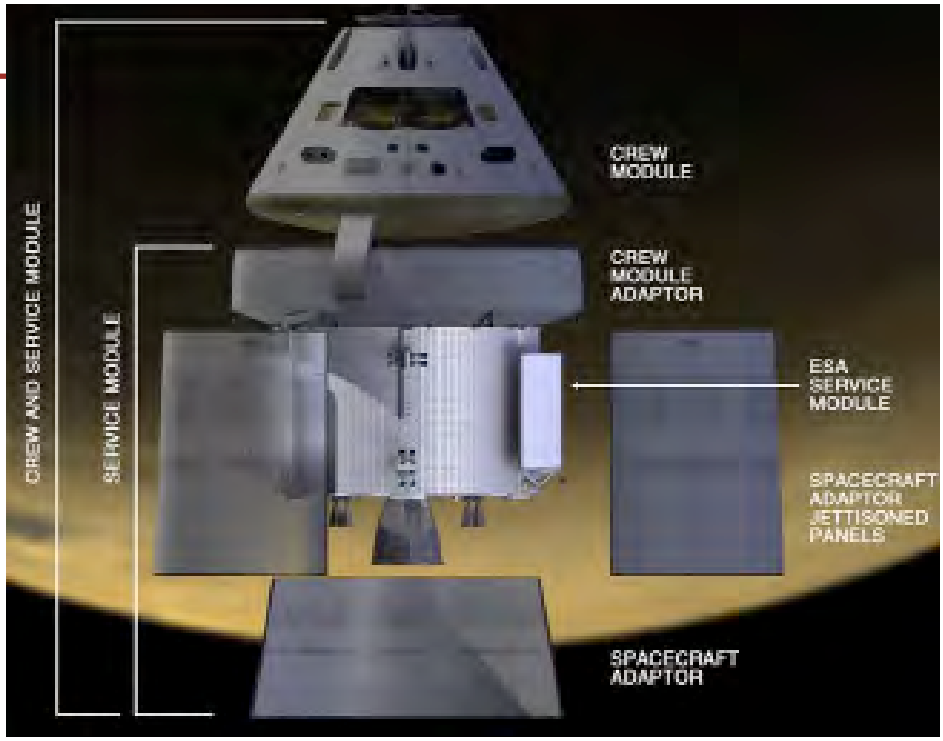
will serve as NASA's crew vehicle for beyond low Earth orbit missions.

"Glenn has unmatched facilities and a workforce with exceptional technical capabilities. This allows us to not only build upon decades of spaceflight heritage, but also lead in the development of the next generation of human exploration vehicles," said Nicole Smith, Glenn's MPCV Crew & Service Module (CSM) lead.

Smith oversees the collaborative efforts of about 50 Glenn civil servant and contractor employees tasked largely to design, analyze, integrate and verify the structural, thermal, mechanical and propulsion systems within CSM. She works closely with Kathy Schubert, who leads the European Space Agency (ESA) Integration Office, and is responsible for managing and integrating ESA's contributions to the development of the service module for the unpiloted Exploration Mission (EM-1) and EM-2 crew mission.

Here's a snapshot of Glenn's other MPCV roles and responsibilities:

Orion Production Operations: Glenn's Orion manufacturing engineering team is performing simulations of spacecraft assembly operations utilizing DELMIA (Digital Enterprise Lean Manufacturing Interactive Application) to assess known or suspected assembly issue (i.e., clash, interference or human access), create an assembly process plan, and validate the vehicle assembly plan and tooling design. These simulations save schedule and cost by optimizing assembly plans and finding issues prior to the final assembly.



The Orion, shown with the new ESA Service Module, is America's new spacecraft for human exploration.

Space Environment Tests: The MPCV Program has approved the European Service Module (ESM) Structural Test Article testing at the Plum Brook Station Space Power Facility (SPF). The tests will begin in the 2014-2015 time frame. Multiple vehicle-level tests—including acoustic, base vibration, modal, thermal vacuum and electromagnetic interference and compatibility (EMI/EMC)—are slated to occur on the ESM STA, EM-1, the Environment Test Article (ETA), and EM-2 at the SPF over the next several years.

Vehicle Integration: Glenn's Requirements Management Office leads the Orion Program for design, interface and verification requirements. NASA Glenn Engineering is developing the Guidance, Navigation, and Control (GN&C) flight software testbed to simulate the EM-1 and 2. In addition, the Loads & Dynamics team provides integrated design and analyses of the CSM structure, focusing on interfaces between the modules and their environments.

Avionics, Power & Software(APS): Glenn's APS team provides support in three key areas: oversight of the MPCV power system architecture (including the ESM); modeling of the power system performance; and validation of the MPCV On-Board Data Network operation. Glenn has a Power System testbed and a network lab that have been used to validate and troubleshoot critical performance aspects of these two subsystems.

To keep current on the spacecraft development and testing activities, visit https://www.facebook.com/NASAOrion.

—By S. Jenise Veris

Photo by Doreen B. Zudell

Lunch With Deputy Director Robinson

During the monthly *Lunch With the Director Of,* May 22, Deputy Center Director Greg Robinson shared his first impressions of Glenn and his goals since joining the staff in February. He joined employees for lunch and conversation after the question and answer session. Pictured, left to right: Dr. Shantaram Pai, Robinson, Alan Richard, Doris Tirone and Jasmine Coad.

Photo by Doreen B. Zudell

National Day of Prayer

Glenn's Prayer Group invited the workforce to join them in National Day of Prayer observances at Lewis Field, May 2. At 7:30 a.m. employees gathered at the flag pole for the annual Prayer at the Pole service. At lunchtime, employees joined in a prayer and praise service in the Administration Building Auditorium.

C-2013-1793 Photo by Michelle Murphy

Aerospace Safety Advisory Panel

Members of the Aerospace Safety Advisory Panel (ASAP) visited Glenn, May 16, to learn about the center's programs and projects, facilities, technical authority and safety practices. They received a briefing from various Glenn directors followed by tours at Lewis Field. Pictured is Mike Meyer, lead technologist for the Cryogenic Propellant Storage and Transfer Project, briefing ASAP members (left to right) ASAP recorder Paula Frankel, Dr. Donald McErlean and Bryan O'Connor, on cryogenic propellant storage and transfer technology maturation efforts over the last year. The hardware shown are samples of Multi-Layer Insulation and Liquid Acquisition Devices.

Photos by Doreen B. Zudell

Events Promote Green Efforts

The center's Green Earth Committee recently sponsored three "Greening NASA Glenn One Event at a Time" activities to promote sustainability awareness. On April 26 at Lewis Field and May 9 at Plum Brook Station, employees slipped on garden gloves to pull garlic mustard plants. This activity aids Glenn's invasive species management efforts and the plants make a tasty dip. On May 2, Cuyahoga Soil and Water Conservation District's Amy Roskilly taught Lewis Field employees how to harvest rainwater for gardens and to combat stormwater overflow. Participants built their own rain barrels to use at home. Pictured above, left: Environmental Scientist Rosemary Walker (center) led the garlic mustard pull at Plum Brook; pictured above, right: Roskilly assists Ariana Miller (SLI) in constructing her rain barrel.

C-2013-1964 Photos by Michelle Murphy

Byun (center) accepts a plaque of appreciation from left to right: Center Director Jim Free, Frances Lawas-Grodek, Wayne Wong and Vik Shyam.

Embracing Cultural Inclusion

Did you know one-third of all Asian American and Pacific Islanders (AAPIs) living in Ohio reside in the Cleveland metropolitan area? During Glenn's AAPI Heritage Month Observance, May 22, keynote speaker Michael Byun offered a profile and dispelled myths about the diverse AAPI cultures that represent Ohio's second fastest growing population. As executive director of Asian Services In Action, Inc., Byun advocates access to health care, programs and services for AAPI immigrants/refugees throughout Northeast Ohio. The event also featured cultural dances, arts and displays representing the diversity of the Asian regions.

C-2013-1979

Celebrating Milestones of First Women in Space

June 2013 Marks 50th and 30th Anniversaries

This month marks significant milestones for pioneering women in space.

Fifty years ago, June 16, 1963, cosmonaut Valentina Tereshkova launched into space aboard the Vostok 6, becoming the first woman in space. Twenty years later, on June 18, 1983, former NASA astronaut Dr. Sally Ride became the first American woman to travel into space when she launched aboard the Challenger's STS–7 shuttle mission.

Honoring the legacy of these women, NASA Glenn is partnering with local organizations to inspire school-age girls to pursue careers in science, technology, engineering and mathematics (STEM) fields. They include Case Western Reserve University (CWRU), Girl Scouts of North East Ohio (GSNEO) and the International Women in Air & Space Museum (IWASM).

On March 22, Associate Director Janet Watkins joined Kim de Groh, Space Environment and Experiments Branch, and Ann Heyward, Ohio Aerospace Institute (OAI), on a panel of women with careers in air and space at the IWASM Women's History Month observance. The event featured tributes to Ride and Tereshkova.

On April 20, more than 100 Girl Scouts, grades 2 to 5, gathered at Case Western Reserve University for the "Girls Take Flight" fair, part of an ongoing partnership between Glenn and GSNEO. The fair featured 24-plus hands-on activity stations developed and staffed by Glenn employees, Case students and an IWASM employee. Astronaut Sunita Williams, a former Girl Scout, addressed the girls in a culminating event, including a presentation on life aboard space station and a question and answer session. All participants received an event patch, designed by Gayle DiBiasio, WYLE/Publishing Services, and Dennis Stocker, Combustion and Reacting Systems Branch.

NASA

Russia's Tereshkova, left, the first woman in space; and Dr. Ride, America's first woman in space.

On June 18, Glenn will hold an annual career day for Girl Scouts, grades 6 to 12, at Lewis Field, exactly 30 years after Ride's first flight.

—By S. Jenise Veris

Photo by S. Jenise Veris

Courtesy of IWASM

Above: Girl Scout event patch. Far left: Lunar Survival activity with Sandra Hardy, OAI. Left, IWASM panelists: Associate Director Watkins; Heyward; Pat Brady, former pilot/traffic reporter; Barbara Williams, FAA retiree; and de Groh.

Welcome Astronaut Stephanie Wilson to Flight Support at Glenn!

Photo by S. Jenise Veris

Wilson in the atrium of the Research Analysis Center, home of her new office.

NASA Glenn is pleased to welcome astronaut Stephanie Wilson to the center.

Wilson began a detail as acting chief of the Program/Project Integration Office, Space Flight Systems Directorate, effective May 6. She assumed the responsibilities of Vince Bilardo who is on a rotational assignment to the Department of Energy as NASA's Advanced Stirling Radioisotope Generator Program Manager.

A veteran of three space flights and former Space Station Integration Branch chief within the Astronaut Office at NASA's Johnson Space Center, Wilson will aid in the design and development of programs/projects. She is eager to ensure program managers have the necessary tools and resources to plan and manage effectively.

"I was attracted to Glenn because fellow astronauts Mike Foreman and Greg Johnson spoke so highly of their details here," Wilson said. "I'm grateful for the opportunity and confident this experience will broaden my perspective and appreciation for the similarities and differences between a research center and a space flight center."

—By S. Jenise Veris

Welcome to the NASA Family

C-2013-1217

C-2013-1437

Photos by Bridget Caswell

Glenn welcomed a new complement of hires to the NASA family in April. Those sworn in on April 8 are pictured right. Front row, left to right: **Flor Carrera**, Center Operations Branch; **Christina Roberts**, Aero, Education & Reimbursable Support Branch; and **Mary Ellen Roth**, Thermal Energy Conversion Branch. Back row, left to right: **Bernard Gamache**, Space Communications Office; **Daniel Bishop**, Space Communications Office; and **Christopher Blake**, Cost & Economic Analysis Office. Pictured, far right are new hires sworn in April 2, left to right: **Raju Shah**, Information and Applications Office; **Gilbert Winter**, Risk Management and Security Office; **Jan Wittry**, NASA Safety Center; and **Richard Haas**, Integration Office.

In Appreciation

I apologize for the delay in thanking you all for the fantastic retirement party and touching "tributes" at Dave & Busters. I will continue to enjoy the thoughtful gifts, gift cards and party "supplies." The National Park membership will be well used on my cross-country trip in my RV. Now that my new hip is healing and I can get around better, I have so many things I'd like to do. But, I really miss seeing all of my wonderful NASA friends. Please stay in touch through Facebook or vlyons@prodigy.net.

—Valerie Lyons

Retirements

Karin Huth, Research & Space Operations Branch, Procurement Division, retired June 3, 2013, with 36 years of federal service, including 33 years with NASA.

Elena Ispas, Mechanical & Fluid Systems Division, Engineering Directorate, retired May 31, 2013, with 28 years of federal service, including 26 with NASA.

Stephen C. Wiersma, Avionics Systems Branch, Electrical Systems Division, retired June 1, 2013, with 30 years of NASA service.

Huth

Ispas

Wiersma

More than a Memory

Frank P. Behning, age 88, who retired in 1988 with 25 years of NASA service, died Dec. 22, 2012. Behning served in the Fluid System Components' Turbodrive Branch developing advanced design procedures and concepts and for programs requiring turbine power. In 1981, while working in the Aerothermodynamics and Fuels Division, he earned a Special Achievement Award for managing the operational requirements of a large number of turbine and combustion research facilities. Behning retired from the Aeropropulsion Facilities and Experiments Division.

Thomas A. Cozzens, 71, who retired in 1995 with 15 years of NASA service, died Jan. 17. Cozzens was a veteran of the U.S. Navy. He later served as the Labor Relations Officer in the East Cleveland Office of the Internal Revenue Service before transferring to NASA in 1980. Cozzens was appointed chief of the Employee/Labor Relations Branch, Personnel Division, following a major Reorganization. He helped negotiate union contracts and buy-in to implementation of a participative work environment initiative. Prior to retiring, Cozzens served as manager of the Community and Media Relations Office, External Programs Directorate.

Joseph L. Fiala, 82, who retired in 1992 with 40 years of NASA service, died March 27. Fiala joined the NACA/NASA workforce in 1952 after serving in the U.S. Air Force. He worked on the Lewis-managed Atlas-Agena rocket systems, which launched six Orbiting Geophysical Observatories between 1964 and 1969; and flight hardware for the Surface Tension Driven Convection Experiment for the first United States Microgravity Laboratory mission. Fiala supported integration and on-orbit testing of the high-power transmitter developed for the Communications Technology Satellite, and later, traveled across the country in NASA's Portable Earth Terminal to help conduct experiments demonstrating satellite transmissions used for teleconferences and emergency communications.

Cozzens

Fiala

Stanley Medovich, 96, who retired in 1977 with 21 years of federal service, died April 4. Medovich spent his entire 14 years of service with NASA in the Fabrication Division, where he worked in the Machine Shop, Outside Fabrication and Metallurgy branches.

Awards, Honors, and Promotions

Manan Vyas, Inlet and Nozzle Branch, is a finalist for one of eight Samuel J. Heyman Service to America Medals, also called Sammies. Vyas is a candidate for the Call to Service medal, presented annually by the nonprofit, nonpartisan Partnership for Public Service, that recognizes a federal employee whose professional achievements reflect the important contributions that a new generation brings to public service. He was nominated for his significant contributions to the field of hypersonic propulsion flows and the embodiment of the spirit of public service. All medal winners and the Federal Employee of the Year will be announced Oct. 3.

The Rotary National Award for Space Achievement Foundation named **Dr. William Marshall**, Propulsion and Propellants Branch, a Stellar Award winner in the Early Career Category, April 26. He is recognized for exceptional leadership and technical expertise in rocket combustion research and testing that has enhanced numerous NASA programs and significantly aided the technical community.

Vyas

Dr. Marshall

Calendar

LUNCH WITH THE DIRECTOR OF: The next Lunch with the Director Of is Wednesday, June 26, noon to 1 p.m. in the Small Dining Room, building 15.

GRC CONNECTIONS: The next GRC CONNECTIONS forum is Thursday, June 20, from 10 to 10:45 a.m. in the Briefing Center Auditorium. Dr. Rubén Del Rosario will present "Propelling the Future of Aviation: a Look to the Past and a Leap Forward."

IFPTE LOCAL 28, LESA MEETING: LESA will host its next membership meeting on Wednesday, July 10 at noon in the Employee Center's Small Dining Room.

JULY PUBLIC TOUR: The next Saturday tour, July 13, will highlight the Icing Research Tunnel. 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.

Get Social with NASA Glenn!

SUSTAINABILITY AWARENESS EVENT: Learn how to produce your own garden fertilizer during the Vermicomposting event, July 18, noon to 1 p.m., Small Dining Room, building 15. POC: Tom Hinshaw, 3-5462.

National Aeronautics and Space Administration

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Managing Editor: **Kelly R. DiFrancesco**

Read AeroSpace Frontiers online at http://aerospacefrontiers.nasa.gov

National Lab Day Draws Hundreds of Young Explorers

The center celebrated National Lab Day with 300 middle and high school students and their teachers, May 17, when NASA professionals engaged students in the NASA mission through multiple hands-on experiences in science, technology, engineering and mathematics (STEM). Glenn Associate Director Janet Watkins offered welcoming remarks followed by a panel discussion. The day also included tours of Glenn's world-class facilities, STEM activities and demonstrations focused on the engineering design process and a presentation on recycling and sustainability. Glenn's Educational Programs Office led the event with assistance from organizations throughout the center.

Pictured, clockwise: Students try their hand at manipulating objects in a glove box display. • Engineers Lance Foster, Hans Hansen and Diana Santiago share their stories. • Colin Creager discusses the importance of improving the performance of roving vehicles for the Moon and planetary applications in the SLOPE facility. • Students explore principles of thermodynamics in action.

C-2013-1755

C-2013-1758

C-2013-1747

Photos by Michelle Murphy

C-2013-1736

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 7 JULY 2013

Taking Out Space Station Trash

Glenn Works on Repurposing Space Trash

If trash disposal/recycling on Earth is challenging, imagine what it is like for the International Space Station crew. So NASA is looking into ways to reduce and repurpose trash generated on the space station.

Glenn is one of six centers involved in NASA's Advanced Exploration Systems (AES) Logistics Reduction and Repurposing (LRR) project focused on identifying the most effective systems for recycling waste to support the space station for 10 more years and for future deep space missions. By repurposing trash, overall launch mass generated by dedicated crew items will be decreased translating to a reduction in mission costs and amount of trash for disposal.

"Currently, astronauts on the space station sort wet and dry trash that's stored until other space vehicles bring supplies. The supplies are unloaded, and the waste, wrapped in the shape of a little football in transparent plastic with duct tape, is loaded

Continued on page 3

Photo courtesy of NASA

Astronaut John Phillps loads assorted items in the storage bin on the space station.

University Capstone Projects: Small Investments, Big Rewards

Crews on long-duration missions beyond low-Earth orbit will need medical capabilities to maintain health as well as diagnose and treat disease. Providing this care will necessitate new medical requirements and the development of technologies to ensure the safety and success of these missions.

Glenn's Exploration Medical Capability (ExMC) Element team develops medical technologies for different levels of care during long-duration space missions. Two years ago, the ExMC and NASA's Human Research Program initiated an extensive "technology watch" to address the need for medical knowledge where the agency has limited expertise.

"Frequently, other agencies, industry or academia have the expertise to help develop these technologies, but are unaware of a need because little has been published about it," explained

Continued on page 2

Seven Glenn Payloads Arrive on Space Station

Photo courtesy of NASA

Hardware components for seven microgravity experiments originating from NASA Glenn demonstrates our scientists and engineers' diverse contributions to several physical science disciplines. Pictured is the ATV-4 successfully docking to the International Space Station. ***Learn more about the payloads on page 5.***

In This Issue

Pulling Earns NASA SFA Recognition

Douglas Pulling, Space Flight Branch, received the prestigious Space Flight Awareness (SFA) Honoree Award during the Director's Senior Management (DSM) Meeting on May 28.

Associate Center Director Janet Watkins and Acting Deputy Director of Space Flight Systems Randy Furnas presented the award to Pulling for "sustained performance as the Space Communications and Navigation (SCaN) program—first as the Communications, Navigation, and Networking Reconfigurable Testbed (CoNNeCT) project scheduler and then as the SCaN program master scheduler."

The SFA Honoree Award is one of the highest presented to NASA and industry employees in first-level management and below, for their dedication to quality work and flight safety.

Left to right: Furnas, Pulling and Watkins pose for a group photo during the DSM meeting.

Capstone Projects

Continued from page 1

ExMC Project Manager Dr. DeVon Griffin, ISS (International Space Station) and Human Health Office. "So finding partners who can fill these areas is crucial to the success of these missions."

ExMC developed a task for a Tech Watch Agent to identify potential partners that could fill "gap" areas where the agency has limited expertise. The search focused on industry associates and universities in the Midwest that have a biomedical or biomechanical engineering department and areas of specialization compatible with Glenn.

Initially, they made little progress, since industry found no commercial appeal in the work. However, universities are clamoring for the opportunity to create meaningful senior engineering projects—commonly referred to as "capstones"—where students perform an assignment as a team effort culminating a final report as a curriculum requirement for graduation.

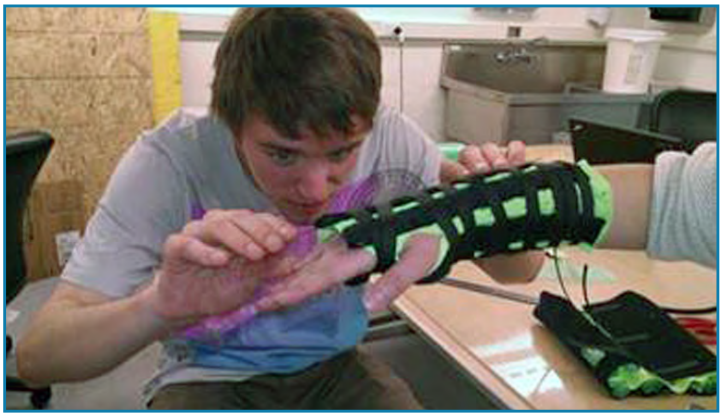
Glenn initially sponsored three student capstone projects, completed in 2012. Six additional student capstone projects have been carried out in 2013. Dr. Aaron Weaver, Bioscience and Technology Branch, mentored the University of Michigan team in 2012, whose goal was to create a "Wrist Fracture Stabilization Device for Microgravity." The device had to immobilize the wrist, protect the fracture from external perturbations, maintain hand function for daily work, and hold low mass and volume.

"I felt it was important for the students to guide their own development. They were not just responsible for developing the product but also for developing the requirements—how it would be developed, verified and tested," Weaver said. "This gave them a feel for the entire design process and led to a great learning experience and final product."

Due to the high demand for capstone work, projects are now limited to one per university per school year. Funding and mentor availability are limited. Costs associated with the ExMC capstone projects ranges from zero to $2000 per project with a short turnaround time—they begin in the fall semester, then at the close of their senior year, they present a final report of their findings with the goal of providing ExMC pivotal information to a gap closure. In return, Ohio State University professor Dr. Mark Ruegsegger cited how students gain valuable skills in working with NASA professionals as project consultants on an open-ended, real-world problem that has application beyond medicine in space.

"The capstones provide an inexpensive mechanism to obtain first-rate research results," said Griffin. "Given the high quality work produced by teams mentored by Glenn, the Element is now working to provide targeted research options and archiving all results. This activity has become a key part of the Element's technical work."

—By Laurel J. Stauber



Courtesy of University of Michigan

University of Michigan engineering student, Geoff Burns, works on the Wrist Fracture Stabilization device.

ExMC Capstone Project Partners

Students from the following universities pursued capstone projects that provided the agency low cost, relatively quick results in the form of a final report, and a fresh perspective to some serious technology gap challenges. They include:

- University of Akron – 2012, 2013
- University of Michigan – 2012, 2013
- Northwestern University – 2013
- The Ohio State University – 2013
- Wright State University – 2013
- University of Illinois at Chicago – 2013

Ideas Count Through Suggestion Program

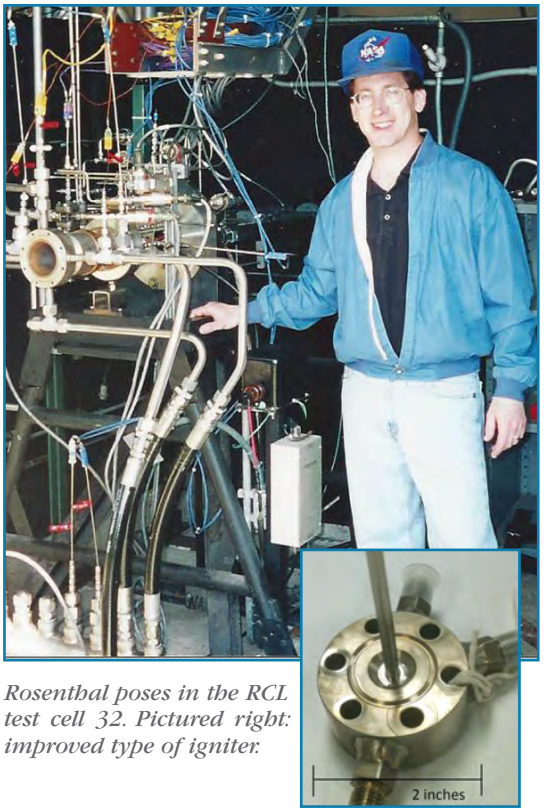
A hydrogen-oxygen torch-style igniter used in rocket engine tests at Glenn for more than two decades, typically performed well when incorporated into numerous chemical rocket engine hardware systems. However, the igniter design prevented Glenn technicians/operators from pressure checking a critical assembled joint prior to use in a rocket engine test.

Bruce Rosenthal, Facility Management & Planning Office, who worked as a test cell operator for years and now works as facility manager, suggested a modification in the fabrication process so operators could perform an inert gas leak check of the braze joint prior to putting the igniter into operation. This would reduce the chance of damaging hardware due to a bad braze. Glenn operators successfully used the new igniter fabrication process prior to recent tests in the Research Combustion Laboratory (RCL).

"I think George Repas, my mentor and former employee who designed the original igniter and manufacturing process, would be pleased with the change I made in the manufacturing process," Rosenthal said.

Rosenthal is one of several employees whose ideas were recently adopted under the Employee Suggestion Program. The program allows cash awards, up to $7,500, paid to employees who submit suggestions that directly improve efficiency, economy and/or effective execution of government operations.

—By Doreen Zudell



Rosenthal poses in the RCL test cell 32. Pictured right: improved type of igniter.

Taking Out the Trash

Continued from page 1

into the vehicle and burned up during reentry," explained Dr. John Lytle, Space Technology Project Office.

Glenn is supporting two tasks under the LLR project: conversion of trash to usable products via heat melt compactor (HMC) processing; and conversion of trash to supply gas (TTSG) to make rocket propellant.

Photo by S. Jenise Veris

Determining the best use of different categories of waste and recycling water are important components of the LRR project to reduce volume and mass. For example, the carbon, hydrogen and water in the organic waste could be used to make more methane for propulsion or more water for life support.

The HMC recovers water from compacted waste materials to produce dry, sterilized plastic tiles that may be used for radiation protection, building materials or disposal. The goal is to advance the design to be compatible with life support elements to support multiple mission applications.

"We're working with NASA Ames on the Heat Melt Compactor (HMC) task to ensure the device meets performance requirements in a low-g environment," Lytle said. "Glenn conducted a zero-g flight experiment in October to support this work. The completion of HMC Gen 2 (ground test unit) is expected at the end of the year. The Gen 3 flight-like unit to eventually be tested on the space station is targeted for fiscal year 2014."

Dr. Mike Kulis injects a syringe of gases, created in a catalytic reactor, into the Gas Chromatic graph to characterize the purity of the gases.

Glenn is also responsible for two of six waste conversion technologies being evaluated for repurposing trash to supply gas (TTSG)—methane gas— as propellant to space. One is a steam reformer developed by Pioneer Aeronautics under an NASA Glenn SBIR Phase II grant. The other is a catalytic wet air oxidation technology that already exist at Glenn and requires minimal heat for activation. The LRR review and down-selection of the conversion technologies for future development occurs at the end of July with the ground demonstration of a test unit expected at the end of the year.

The data and analysis of these technologies developed for LRR will be critical not only for identifying future logistics systems to support multiple exploration missions, but also for innovative waste management and energy alternatives here on Earth.

—By S. Jenise Veris

Ohio Aerospace Day at the State House

Center Director Jim Free touted NASA Glenn as an "indispensable technology asset to Ohio and the aerospace industry" in his remarks before members of the Ohio Aerospace Caucus during the 4th Annual Ohio Aerospace Day event on June 5. The Ohio Aerospace & Aviation Council hosted the event that featured a keynote address by former astronaut Dr. Ronald Sega, vice president and enterprise executive for Energy and Environment for The Ohio State University and Colorado State University.

Sega gives the keynote.

Free, seated third from left, serves as a government panelist.

Cleveland Mayor Jackson Gets Up Close with Glenn

Deputy Center Director Greg Robinson welcomed Cleveland Mayor Frank Jackson and his Chief of Government & International Affairs Valarie McCall to NASA Glenn for a briefing and tour on May 29. Robinson gave an overview of the center's current research and development and Robyn Gordon, director of Center Operations, briefed the visitors on Glenn's K–12 educational programs and initiatives that currently serve the Cleveland Metropolitan School District. Pictured, on tour in the Electric Propulsion Laboratory, left to right: Robinson, Jackson and Dan Herman, Propulsion and Propellants Branch.

Library's Caped Crusader Named "Staxx"

The NASA Glenn Science & Engineering Library's cape crusading mascot now has a name—Staxx! Congratulations to Lisa Liuzzo, Logistics and Technical Information Division, for submitting the winning entry to the library mascot-naming contest held during the Library Commons Open House, April 23. Coincidently, Liuzzo is the graphic artist who designed the mascot last year. In May, the library staff narrowed the list to their top 5 before the Glenn community weighed in on Staxx as their #1 choice. Next time you see the superhero battling misinformation at the Mobile Library Desk, flying around the center on library postings or using his Herculean research powers in the library, you can greet him by name. Pictured is Staxx with the library staff.

C-2013-2397 Photo by Bridget Caswell

AeroSpace Frontiers Earns Gold

The Association of Marketing and Communication Professionals has awarded a 2013 "Gold" Hermes Creative Award to NASA Glenn's *AeroSpace Frontiers* newsletter. The staff of Kelly DiFrancesco, Doreen Zudell (SGT) and S. Jenise Veris (SGT) earned the award in the category of "Design/Publication Overall." Hermes Creative Awards is an international competition for creative professionals involved in concept, writing and design of traditional or emerging media. The Gold Award is presented to those entries judged to exceed the high standards of the industry norm. Nineteen percent of the 5,600 entries earned this award.

Glenn Experiments Take Residence on Space Station

Scientists and Engineers Contribute to Microgravity Research

Hardware components for seven microgravity experiments originating from NASA Glenn are settling into their new home on the International Space Station (ISS). The payloads arrived last month via Europe's Automated Transfer Vehicle (ATV-4) or "Albert Einstein," which successfully launched aboard an Ariane 5 rocket, from Kourou, French Guiana, on June 5.

"The fact that we launched hardware for seven different experiments highlights Glenn's microgravity scientists and engineers' diverse contributions to several of the physical science disciplines that carry out research on the ISS: combustion science, fluid physics, complex fluids and acceleration environment characterization," said Fred Kohl, Glenn's ISS Physical Sciences Research project manager.

For more information on these experiments, visit http://ISSResearchProject.nasa.gov.

New Payloads

- Constrained Vapor Bubble-2 (CVB–2) 30-mm Sample Module in the Equipment Transfer Module and a CVB accessory kit
- Advanced Colloids Experiment (ACE) magnetic mixer and a drill kit to mix the samples for future ACE experiments
- Capillary Flow Experiment-2 (CFE–2)modules: five units launched to fill out the set of 11 that comprise CFE–2
- Space Acceleration Measurement System (SAMS) triaxial sensor head and cable
- For the Flame Extinguishment Experiment Italian Combustion Experiment for Green Air (FLEX–ICE–GA), two fuel reservoirs with surrogate biofuels and two fuel deployment needles
- For the Combustion Integrated Rack (CIR), an Illumination Control Module and four 2.25-liter gas bottles
- For the Dispositif d'Etude de la Croissance et des Liquides Critiques (DECLIC), the new High-Temperature Insert-Reflight (HTI–R) sample cell provided by the Glenn principal investigators

News and Events continued

Photo by Doreen B. Zudell

Memorial Day Reflection

Employees took time to honor America's fallen war heroes during Glenn's Memorial Day Observance Ceremony, May 24. Sponsored by the Veterans Awareness Committee (VAC), the observance featured Plum Brook Management Office Chief and Retired Brigadier General David Stringer, who shared his thoughts on how to remember fallen heroes and their families. Center Director Jim Free, accompanied by VAC members Jim Fleet and Peggy Cornell, presented the memorial wreath. Flag bearers, left to right, are: Samantha Brinkman, Jim Blankschaen, Francine McWhorter, Sgt. Jonathan Vazquez, Mike Kulis, Don Pulac and Les Carmean.

Captain America Crew on Glenn Set

On a day off from filming in downtown Cleveland, several members of the *Captain America: Winter Soldier* production crew visited Lewis Field on June 10. Coordinated through NASA Glenn's Community and Media Relations Office, the visit included an informational briefing from Deputy Director Greg Robinson and tours of three research facilities. Pictured, right, is Julius Giriunas, Facility Management & Planning Office, briefing visiting crew members on a test in the 10- by 10-Foot Supersonic Wind Tunnel.

C-2013-2299 Photo by Bridget Caswell

Awards and Honors

For the past 22 years, Allen Loew performed countless outreach events for NASA Glenn, including public tours and presentations at the former onsite Visitor Center. On May 4, after supporting the center's monthly public tour in the Altitude Combustion Stand, Loew retired as a volunteer. External Programs Division Chief Steve Sanderson was on hand to thank Lowe for his dedication and service and to present him with an Ohio astronauts' plaque as a remembrance of his commitment as a NASA ambassador.

Photo by Robert Tome

Loew, left, holding plaque with Sanderson.

Stauber

On May 18, Laurel Stauber received Baldwin Wallace University's Alumni Merit Award, the highest recognition bestowed upon an alumnus. Stauber, who is currently detailed to the Program/Project Integration Office in the Space Fights Systems Directorate as a Tech Watch Agent, was recognized "for her powerful influence on research, innovation and the application of technology to benefit society."

Photos by NTA/ Mark Sorrells

Above: Thomas, center, accepts Lifetime Achievement plaque presented by left, NTA's Vice-president Dr. Bilal Bomani, Bioscience and Technology Branch, and President Dr. Lateef Saffore.

Suárez

Doxley

The Cleveland Chapter of the National Technical Association (NTA) honored three Glenn employees during the annual Nsoroma Technical Symposium and Awards Dinner, June 7, at the Ohio Aerospace Institute.

Former Center Director Dr. Julian Earls delivered the keynote address highlighting the characteristics of the Nsoroma honorees—men and women of color in the fields of science, technology and education, who exude strong leadership, academic achievement and community activism.

Charles Doxley, an electronics engineer in the Flight Communications Branch who designs and develops software programs to test spacecraft, received the Nsoroma Prince Award. **Vicente Suárez** a mechanical engineer and authority on vibration testing in the Structural Systems Dynamics Branch, received the Nsoroma Award for Technology. **Mack Thomas**, a community outreach specialist in the Community and Media Relations Office whose NASA career spans over 40 years, received the Nsoroma Lifetime Achievement Award. For more information on the honorees and the event visit http://ntacleveland.com.

Welcome to the NASA Family

C-2013-1643

C-2013-1781

Photos by Bridget Caswell

Welcome to the following Pathway Interns who joined the NASA Glenn workforce in May! Pictured, left front row, left to right: Matthew Muscatello, Flight Software Branch; Amy McNelis, Procurement Division; and Rocco Viggiano, Polymers Branch. Back row: Roy Kucia, Mission Support Office; Daniel Ingraham, Acoustics Branch; and John Maroli, Flight Software Branch. Pictured, right, front row, left to right: Elizabeth Turnbull, Cost & Economic Analysis Office; Valerie Weisner, Ceramics Branch; Steven West, Systems Verification and Operations Branch; Corrine Sackett, Energy and Environmental Management Office; and Aaron Maness, Power Systems Development Branch. Back row: Matthew Fakler, Mission Support Office; Logan Larson, Space Propulsion Branch; Jonathan Kratz, Controls and Dynamics Branch; and Alexander James, Networks and Architectures Branch.

More than a Memory

Carmen R. Coletta, 95, who retired in 1978 with 34 years of federal service, died May 9. Coletta was a U.S. Air Force Veteran of World War II, who also served in the Air National Guard during the Korean conflict. Upon discharge, Coletta joined the Cleveland NACA/NASA workforce where his father, Orazio, also worked until retirement in 1958. Coletta honed his aircraft mechanic skills in the Test Installations Division throughout his 26-year NASA career supporting tests and development of aircraft in a variety of facilities including the Altitude Wind Tunnel, the Electric Propulsion Research Building/Lab and the Engine Research Building.

Joseph DeFazio, 86, who retired in 1987 after 30 years of federal service, died April 30. DeFazio was an Army Air Corp veteran of World War II, who later joined NASA Lewis in 1960. DeFazio supported tests and development of aircraft engines primarily at Plum Brook Station. Prior to retiring, DeFazio worked in the Aeropropulsion Facilities and Experiments Division, where he earned a 1983 NASA Group Achievement Award as a member of the Energy Efficient Engine (E3) Project Team. DeFazio was also a founding member of the Great Circle Flying Club formed to promote piloting aircraft among fellow employees and friends.

Myron E. Hill, 59, who retired from NASA in 2009 with 24 years of NASA service, died April 27. Hill was a project scientist in the Microgravity Science Division, whose expertise was fluid physics. He was a 1994 Silver Snoopy award winner for support to the European Space Agency-developed Bubble Droplet Particle Unit experiments that flew on the second International Microgravity Laboratory (IML-2) Space Lab module. However, his legacy lies in contributions to the Fluids Integrated Rack for the NASA Lewis-developed Fluids and Combustion Facility (FCF). The FCF is one of the first facilities installed onboard the International Space Station (2002) in support of NASA's Human Exploration Program.

John H. Povolny, 90, who retired in 1974 with 31 years of NASA service, died May 7. Povolny was a pioneering engineer, who specialized in propulsion systems. Among his career highlights was a NASA citation for outstanding management and engineering contributions to the Atlas-Centaur Project while serving as chief of the Test Engineering Branch in Lewis' Centaur Project Office. He was responsible for the full-scale in-house testing of flight hardware for the Centaur rocket, which became the workhorse of the nation's launch vehicles. Prior to retirement, Povolny served as chief of the Engine Research Branch, Airbreathing Engines Division, responsible for full-scale engine test programs in support of the nation's commercial and military aircraft programs.

Colletta

Povolny

Calendar

GRC CONNECTIONS: The next GRC CONNECTIONS forum is Thursday, July 18, from 10 to 10:45 a.m. in the Briefing Center Auditorium. Panelists will address the topic: "Counterespionage and Intellectual Property Protections: What You Don't Know Can Hurt You."

LUNCH WITH THE DIRECTOR OF: The next Lunch with the Director Of will be Wednesday, July 24, noon to 1 p.m., Small Dining Room, building 15.

AUGUST PUBLIC TOUR: The next Saturday tour, Aug. 3, will highlight the Flight Research Building. See the S-3B Viking and other NASA planes. Tours are open to U.S. citizens and lawful permanent residents. Space is limited and reservations are required. To register, call 216-433-9653 or send an e-mail 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 host its next membership meeting on Wednesday, Aug. 14, noon, Employee Center's Small Dining Room.

RETIRED WOMEN'S LUNCHEON: The next luncheon will be held Thursday, Aug. 15, 1 p.m., Orchid Café Restaurant, Miller Nature Preserve, 2739 Center Road (Rt. 83), Avon. For reservations, call Gerry Ziemba, 330-273-4850. Luncheons are held the third Thursday of February, May, August and November.

Retirements

Sandy Clay, Space Processes and Experiments Division, retired Jan. 3, 2013, with 37 ½ years of government service, including 31 at NASA.

Clay

National Aeronautics and Space Administration

John H. Glenn Research Center at Lewis Field
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www.nasa.gov

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August issue copy deadline: July 19, noon

Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

Construction Strategy From Ground Up

Replacing Glenn's Aging Support Systems

Most people give little thought to pipes and wires snaking under buildings and roads, but the quality of underground infrastructure can limit the center's ability to operate facilities and conduct research. NASA Glenn is in the midst of a 20-year, $200 million multiphase construction plan to replace the center's aging support systems.

"Glenn has the oldest underground infrastructure in the agency, with some systems dating back 70 years," said Gene Stygles, Facilities Division (FD) chief. "It's vital we update these systems to accommodate not only existing facilities but also future construction."

Glenn recently completed construction, initiated in 1999, to upgrade its sanitary sewer and natural gas systems at Lewis Field (LF). Current and future projects—expected to continue through 2020—focus on domestic water, electrical, steam, storm sewer and communications systems.

The work, which began with rigorous design and planning stages, is part of the center's Facility Master Plan. Many of these projects have been identified to meet regulatory mandates—such as federal energy and water reduction goals or regional requirements for reducing rainwater runoff. In some cases, the equipment has surpassed its useful life and is in need of replacement.

"In the case of the communications systems, by replacing copper cables with fiber optic cables we're reducing the number of underground cables six to one, and the fiber optic cable is a small fraction of the copper cable size," said John Selby, FD Project Management Branch chief.

Phase I of the steam system replacement on Taylor Road.

Stygles said construction schedules are set to minimize impact on facilities and employees, but sometimes the scope of a project makes it challenging. For example, it is hard to miss work on the steam trench in front of buildings 15 and 21. This project will replace piping from the Steam Plant south along Taylor Road to building 50 and from the Steam Plant east across Ames Road to building 5. Phase I will wind down in November so steam can be supplied during the winter months, and Phase 2 will resume farther down Taylor Road in spring 2015. Projects centering on communications, electrical and water systems will continue through the winter months.

For more information on these and other construction projects at Lewis Field and Plum Brook, visit the FD website at http://fd.grc.nasa.gov/.

—By Doreen B. Zudell

Construction on the Horizon

- Demolition of Underpass Road Bridges at LF
- Security Improvements for New PBS Main Gate
- Repair Institutional Systems at Space Power Facility

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 8 AUGUST 2013

SpaceX Testing Completed at Plum Brook

How loud is 166 decibels? It's about as loud as the thrust of 20 jet engines or a rock concert with 36,000 speakers. It's also the level of noise some spacecraft experience when launched and is now the highest level of noise that can be produced in the Reverberant Acoustic Test Facility (RATF) located at NASA Glenn's Plum Brook Station (PBS).

Space Exploration Technologies Corp. (SpaceX) recently completed testing on a 5.2-meter fairing for its Falcon 9 rocket in the RATF. The tests confirmed the fairing could withstand the harsh conditions associated with space travel.

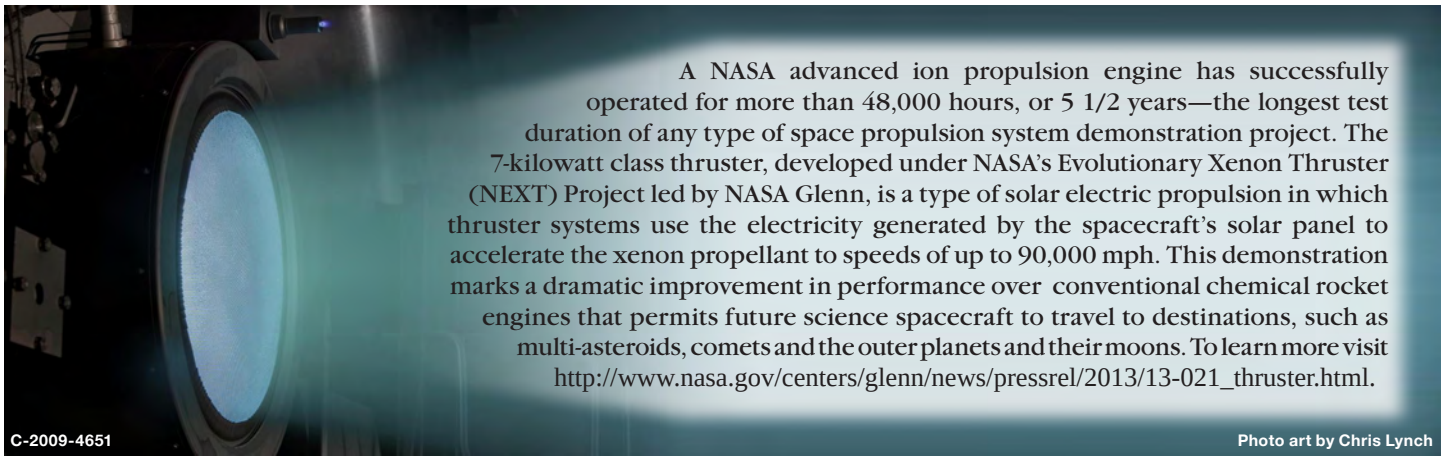
"Testing at Plum Brook enabled simulation of some unique flight conditions, furthering what we are able to do on the ground to ensure flight success," said Elon Musk, SpaceX CEO and chief designer.

The SpaceX fairing tests prove the Plum Brook Station Space Power Facility (SPF) can provide vibroacoustic test capabilities and one-stop space environmental testing for space vehicles. The SPF, now, combines the world's largest vacuum chamber and the world's most powerful low-frequency mechanical vibration test stand in one facility that is unrivaled in its space environment simulation test capabilities. For more information about the SPF, visit: http://facilities.grc.nasa.gov/spf/.

Pictured are members of the SpaceX and PBS team that prepared and performed testing of the Falcon 9 Payload Fairing in the new acoustic chamber.

Photo by Chris Lynch

NASA Thruster Achieves World Record 5+ Years of Operation



A NASA advanced ion propulsion engine has successfully operated for more than 48,000 hours, or 5 1/2 years—the longest test duration of any type of space propulsion system demonstration project. The 7-kilowatt class thruster, developed under NASA's Evolutionary Xenon Thruster (NEXT) Project led by NASA Glenn, is a type of solar electric propulsion in which thruster systems use the electricity generated by the spacecraft's solar panel to accelerate the xenon propellant to speeds of up to 90,000 mph. This demonstration marks a dramatic improvement in performance over conventional chemical rocket engines that permits future science spacecraft to travel to destinations, such as multi-asteroids, comets and the outer planets and their moons. To learn more visit http://www.nasa.gov/centers/glenn/news/pressrel/2013/13-021_thruster.html.

C-2009-4651

Photo art by Chris Lynch

In This Issue

Scoring High on SBA Procurement Scorecard

NASA has achieved an "A" on the fiscal year 2012 (FY 12) Small Business Administration (SBA) Procurement Scorecard. Glenn aided NASA's climb to this level of success through small business prime contracts awarded for FY 12.

Glenn achieved four out of five prime contractor goals in FY 12 to ensure each small business category—small business concerns, small disadvantaged business, HubZone,

Continued on page 2

Free Stresses "Stability" at Plum Brook Station All Hands

C-2013-2755

C-2013-2746 Photos by Bridget Caswell

At the July 10 All Hands meeting at Plum Brook Station, Center Director Jim Free told employees that finding "stability" for NASA Glenn is his top priority. He stressed that Plum Brook and Lewis Field intertwine equally to make up one center.

"I get frustrated with budget challenges just like all of you," Free affirmed. "So we're working to find a strategy that insulates us from the ups and downs."

In addition to stability, Free said advocating for programs that bring work to the center—partnering internally within the agency or externally with industry—is a high priority under his leadership. He talked about the value of an empowered workforce that feels comfortable in sharing recommendations for improvements. Free also highlighted the successes of SpaceX testing and Plum Brook Reactor Decommissioning Project. Retirees who had worked on the decommissioning project were invited to the All Hands. Those attending commented on their decommissioning activities while viewing a time-lapse video. Pictured, top: Free answers employees' questions during the All Hands. Pictured, right: Retirees at the All Hands.

SBA Scorecard

Continued from page 1

women-owned small business, and service-disabled-veteran owned small business—had a fair share of work with the federal government. As a result, the center had the agency's highest percentage of prime contract small business in FY 12, at 70 percent.

In addition to hosting a HubZone Industry Day in June, Glenn personnel also conducted small business workshops at county libraries and participated in other SBA events throughout FY 12, prior to presenting at the NASA Technology Showcase in November. All these events were designed to inform and/or solicit small businesses' interest in learning about upcoming business opportunities with NASA.

"Our acquisition staff and technical community receive the training needed to stay current on small business issues," said Teresa Monaco, Small Business specialist. "This is reflected in our contributions that enable NASA to achieve government-wide statutorily mandated goals."

Currently, Glenn is exceeding all five prime contractor small business category goals for FY 13 and leads the agency with the highest percentage at 73 percent, evidence of its firm commitment to promoting small business and helping the agency meet its future goals.

Class of 2013 CFCLI Graduates

C-2013-065 Photo by Bridget Caswell

Cleveland Federal Executive Board Executive Director Michael Goin, left, joins Glenn Associate Director Janet Watkins, right, in congratulating Aldrich and Stueber.

Suzanne Aldrich and **Thomas Stueber** recently graduated from the Cleveland Federal Community Leadership Institute (CFCLI). The 9-month program develops leaders committed to advancing cooperation among federal agencies in the Greater Cleveland area, while strengthening community partnerships. Participating in a community service project that linked federal government resources with local community needs was required prior to CFCLI graduation.

Aldrich, Facilities Division Project Management Branch, supported the "Feeding Seniors for the Summer" project, created as a sustainable food drive to replenish nonperishable food items for the Lorain County Office on Aging food pantry. Her CFCLI team partnered with Lorain County members of the Girl Scouts of Northeastern Ohio.

Stueber, Communications, Instrumentation, and Controls Division, initiated the "TEACH (Take-Home Educational Activity Center for Children)" project by collecting books and other preschool learning materials for the Cleveland Center for Families and Children, Archwood Head Start School.

Glenn Debuts Food Service Pilot Program

Cafe Offers New Fare and Atmosphere

NASA Glenn has launched a food service pilot program that offers employees a unique experience in cafeteria dining, featuring locally owned food vendors and food trucks at Lewis Field. The program began on Aug. 1, at the conclusion of the 8-year contract with Acorn Food Services.

The new program promises to provide variety, quality and value to please the most discerning patrons. Employees can enjoy a choice of cuisine from one to two different food trucks available each weekday on the north-side parking lot, adjacent to the cafeteria. At the same time, locally owned restaurant vendors such as Donatos, Jimmy John's and Chick-fil-A offer additional food selections on a rotating basis at stations inside the Glenn Café. Breakfast will be available from 7 to 9 a.m. and lunch from 11 a.m. to 2 p.m. The names of each food truck and vendor participating in the pilot, with links to their individual websites and menus, is posted on the new Glenn Café website at https//www.grc.nasa.gov/WWW/glenncafe/.

—Graphic by Kelly Shankland

"We're initially expecting some crowds due to the excitement and novelty of the program," said Institutional Resources Analysis Division Chief Aimee Bergquist, the Food Services Team lead, "So, we encourage employees to use the website to familiarize themselves with the new service model and help them plan their visit."

The Food Services Team expects to attract a wider variety of vendors throughout the year. Additionally, the team is exploring a self-serve "Micro-Market" for employees whose appetite urges do not coincide with the normally scheduled lunch hours. Further details about the micro-market will be announced at a later date.

—By S. Jenise Veris

Prototype Radio Provides Critical Communications Link

Photo by Steve Walker

Griner coordinates this testing from his seat behind the cockpit of the S-3 Viking airplane.

NASA Glenn's communications experts have begun flight testing a prototype radio as part of the agency's contributions toward fully integrating civil and commercial Unmanned Aircraft Systems (UAS) into the National Airspace System.

This particular radio is one of the first steps to provide the critical communications link for UAS pilots on the ground to safely and securely operate their remotely piloted vehicles in flight even though they are many miles—if not continents or oceans—apart.

"So far the tests are going well and we're learning a lot about how this prototype radio operates under various conditions, but we still have much more testing to do on this radio and others that will come," said Jim Griner, Networks and Architecture Branch.

To learn more about these tests on NASA's S-3 Viking research aircraft, read the complete story on NASA Glenn's Web portal at http://www.nasa.gov/topics/aeronautics/features/uas_prototype_radio.html#.UeQFgLYmx7U.

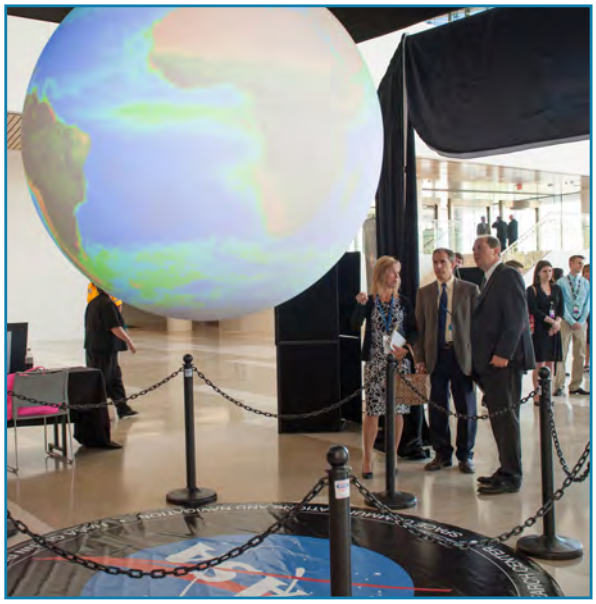
Women@Glenn Video Honors Inspirational Women

Ready to be inspired? Be sure to check out a new video featuring all of Glenn's nominees for the 2013 Women@NASA interactive project. The video, which provides a glimpse of our nominees and their inspirational messages, offers women encouragement to consider a career at NASA. Congratulations to Terrian Nowden, Debbie Zamostny and Michelle Mader, whose packages were forwarded to Headquarters on behalf of the center, and to all the women who submitted nominations. To see the video, visit http://www.grc.nasa.gov/WWW/AdvisoryGroups/WAG/events.html.

Renovated Visitor Center Showcased at Space Week

The Great Lakes Science Center celebrated Space Adventure Week, July 8–14, with the opening of its newest gallery in the NASA Glenn Visitor Center. The 3,000-square-foot area, called Discover, highlights the underlying science and engineering principles that make major accomplishments possible in space and aeronautics. The Community and Media Relations Office staff led the effort to develop the new exhibits and multimedia content. They also lined up speakers and special exhibits for the week-long celebration while members of the Education Programs Office conducted demonstrations. Pictured, far right: the Power Lab is one of four new technology theme areas in the Discover gallery. Pictured, right: Two visitors watch a launch in the new Rocket Lab in the Discover gallery.

Photos by David DeFelice



C-2013-2372 Photo by Michelle Murphy

Showcasing Medical Technology

NASA's Science on a Sphere display of Space Communications and Navigation technologies and their benefit to the biomedical discipline was showcased at the Global Center for Health Innovation (GCHI) during the ribbon-cutting ceremony for the new Cleveland Convention Center, June 14. The GCHI displays the future of health and healthcare innovation, technology, education and commerce through state-of-the-art spaces, programs and virtual offerings. Pictured by the display are Associate Director Janet Watkins, Space Flight Systems Director Bryan Smith and Space Operations Project Office Division Chief Dr. John Sankovic.

Veterans: Join Us for Lunch!

The Veterans Awareness Committee (VAC) will host a Veterans Appreciation Luncheon on Aug. 23 at the Guerin Management Center from 11:30 a.m. to 1 p.m. Cost for the luncheon is $7 and includes Jersey Mike Sub sandwiches, chips, soda and dessert. RSVP and payment must be received by Aug. 19 to Samantha Brinkman 216–433–6613 or Valerie Daniel, 216–433–2327. All veterans—working at Glenn, retired or contractor—are encouraged to attend to spend some time reminiscing with fellow veterans.

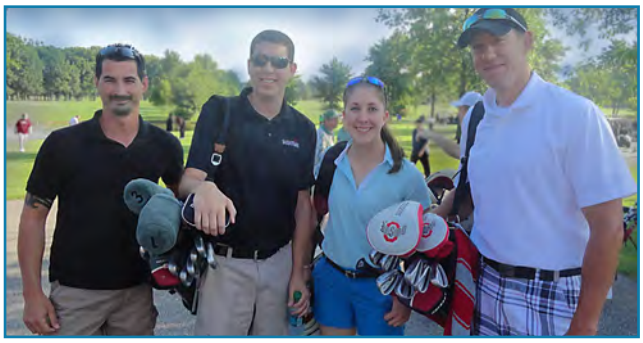
C-2013-2605 Photo by Bridget Caswell

Dr. Grunsfeld Tours Research Facilities

NASA Associate Administrator for the Science Mission Directorate Dr. John Grunsfeld visited Lewis Field for a center overview and an informational tour of several facilities, June 28. Pictured, left to right: are Deputy Director Greg Robinson, Director Jim Free, Grunsfeld, Ann Over, John Hamley and Marc Gibson, discussing the Advanced Stirling Radioisotope Generator.

Not Just Playing A Round: Glenn Golfers Tee-up Camaraderie and Competition

Photos by Jim Onest

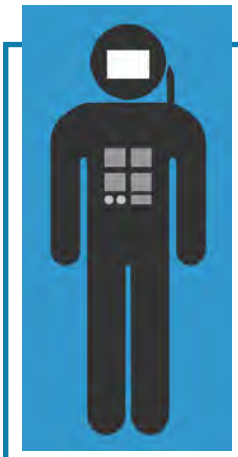


On July 11, Glenn employees, retirees and friends gathered at Mallard Creek Golf Course for the 4th annual Glenn Research Center golf outing. A total of 228 golfers participated in the four-person scramble. Although the course was somewhat mushy, it did little to slow down this year's winners: Red 18-holes—Lynne Sahay, Erin Dowdell, Dave Winchell and Mike Hein (11 under par 61); and on the Blue 18-holes—Tim Monk, Kevin Meredith, Jeff Schultz and Art Hugo (15 under par 57). All the results are posted on *Today@Glenn*. Pictured, above: Golfers mingle and prepare to play. Pictured, left, left to right: Patrick Edmonds, Tony Doglio, Bridget Popovic and Chris Williams.

Adjutant General Ashenhurst Visits

On July 15, Major General Deborah Ashenhurst, Adjutant General, Ohio National Guard, accompanied by her executive officer Major Phillip McGonagill and Director of Operations for the Ohio Air. National Guard Colonel Zane Brown, toured Plum Brook Station and Lewis Field campuses and met senior managers and enhance her understanding of the research and technology development work performed at the center. Pictured is Glenn's chief of Aircraft Operations Alan Mickle-wright, far left, conducting a tour of the Hangar for, left to right, McGonagill, Ashenhurst and Brown, who were escorted by Center Director Free.

C-2013-2851 Photo by Michelle Murphy



Ohio Astronaut Facts

Did you know Ohio is home to 25 astronauts who have taken 78 space flights and 3 trips to the moon? Learn more interesting facts about these astronauts by visiting NASA Glenn's Web Portal. It offers a brand new set of interactive features on the Ohio Astronaut pages. Very cool stuff!

Link directly to these pages:
http://www.grc.nasa.gov/WWW/portal/apps/astros/
http://www.grc.nasa.gov/WWW/portal/apps/map/

Centaur 50th Celebration

Save the date and plan to help celebrate the 50th anniversary of Centaur, the upper stage rocket developed and managed by NASA Glenn over 35 years. Festivities will be Friday, Nov. 22, hosted by the Ohio Aerospace Institute in the NASA Glenn Visitor Center located at the Great Lakes Science Center.

Awards and Honors

Dr. Arnold

Foster

Dr. Landis

ASM International (formerly the American Society of Metals) has elected **Dr. Steve Arnold**, chief of the Mechanics and Life Prediction Branch, to the rank of fellow. Arnold is recognized for pioneering work in the area of constitutive modeling of metallic and composite materials and for his leadership in ASM's contributions to the Integrated Computational Materials Engineering and Materials Genome Initiative.

Lance Foster, Inlet and Nozzle Branch, has been elected president of the National Technical Association, the nation's oldest (since 1925) technical association of minority scientists and engineers. Foster is an aerospace research engineer focused primarily on wind tunnel testing and computational analysis for air-breathing propulsion. He is currently part of the Boundary Layer Ingesting Inlet Distortion Tolerate Fan research team.

The American Institute of Aeronautics and Astronautics (AIAA) presented the 2013 AIAA Aerospace Power Award to **Dr. Geoffrey Landis,** Photovoltaics and Power Technologies Branch, July 16, during the 11th International Energy Conversion Engineering Conference. Landis was recognized for 35 years of developing advanced photovoltaic power systems for extreme space environments; providing leadership, fostering innovation, interfacing with the public; and contributing to an improved scientific understanding of operating solar power devices from the solar corona to the Martian surface and beyond.

Welcome to the NASA Family

C-2013-2062

C-2013-2460

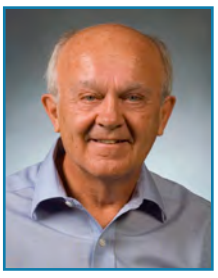
Photos by Bridget Caswell

Welcome to the following new employees who reported for duty/orientation in June. Pictured above, left, and left to right: Hyemin Yoon, Mechanical & Rotating Systems Branch; Jordon Spence, Engineering Management Branch; Michael King, Icing Branch; Taylor Pember, Engineering Management Branch; Kliti Kodra, Networks and Architectures Branch; Hyeon Kim, Operational Safety Branch; and Anthony Wilford, Integration Office. Above right, left to right: Daniel Saccomando, Exploration Systems Branch; Adam Wroblewski, Optical Instrumentation and NDE Branch; Michael Robbins, Planning and Integration Office; David Sadey, Engineering Management Branch; Dwight Robinson, Center Operations Support Branch; Rigoberto Roche, Aerospace Communications Systems Branch; Amanda Stevenson, Mechanical & Rotating Systems Branch; Steven Korn, Power Systems Engineering Branch; Jonathan Metscher, Thermal Energy Conversion Branch; and Raymond Robinson, Space Combustion and Materials Branch.

Retirements

Ihor T. Kiryk, Community & Media Relations Office, Center Operations Directorate, retired Aug. 2, 2013, with 44 years of federal service, including 40 with NASA.

Marilyn Stolz, Procurement Division, Center Operations Directorate, retired July 3, 2013, with 36 years of NASA service.



Kiryk

Stolz

More than a Memory

Frank E. Belles, 90, who retired in 1974 with 27 years of NASA service, died June 22. Belles was a chemist renowned for his definitive study of hydrogen combustion and was chief author of NASA's hydrogen safety manual, which was crucial for Apollo and other missions. He also contributed to a rocket propellant safety manual. He became NASA Lewis's Associate Director in 1972, while also serving as director of the Aerospace Safety Research and Data Institute. Belles was a U.S. Navy veteran. His son-in-law, James Felder, works in the Propulsion and Control Systems Engineering Branch.

Belles

Miser

John E. "Jack" Cotter, 65, who retired in 2004 with 38 years of NASA service, died June 3. Cotter was a mechanical engineering technician, who served the bulk of his career in the Test Installation Division's Engine Research Branch. He retired from the Space Combustion and Microgravity Technical Branch, Research Test Division.

James W. Miser, 89, who retired in 1979 with 25 years of NASA service, died May 9. Miser was a U.S. Air Force veteran and mechanical engineer who, early in his NASA career, aided research for a lunar lander. He retired as a budget analyst in the Resources Management Office. Miser was a member of the Speakers Bureau and active participant in NASA and neighboring Berea community outreach. *Former coworkers and friends are invited to attend a "Celebration of Life" service for Miser, Aug. 24 at 3 p.m. at the United Methodist Church of Berea, 170 Seminary St., Berea, OH 44017.*

Steiner

Tesar

Gordon "Gordie" R. Steiner, 82, who retired in 1987 with 33 years of NASA service, died May 21. Steiner was a U.S. Army veteran who began his NASA career in the 1956 Apprentice Class and became a mechanical engineering technician in the Fabrication Support Division. Steiner supported composite analysis and testing for advanced aircraft turbine engines. His son, Ray Steiner, is an SGT employee in the Logistics and Technical Information Division.

Ruth Hanna Tesar, 88, who retired in 1982 with 22 years of federal service, died May 17. Tesar was a secretary for the U.S. Air Force before joining the NASA Facilities Operations Division in 1966. She retired from the Fabrication Division's Outside Fabrication Branch. Tesar was a member of the Lewis Social Activities Committee and remained active coordinating the monthly NASA Women's Retiree Luncheon. Her husband, NASA retiree Lenny Tesar, died in 1995.

Calendar

IFPTE LOCAL 28, LESA MEETING: LESA will host its next membership meeting on Wednesday, Aug. 14, noon, Employee Center's Small Dining Room.

RETIRED WOMEN'S LUNCHEON: The next luncheon will be held Thursday, Aug. 15, 1 p.m., Orchid Café Restaurant, Miller Nature Preserve, 2739 Center Road (Rt. 83), Avon. For reservations, call Gerry Ziemba, 330-273-4850.

GRC CONNECTIONS FORUM: The next forum is Thursday, Aug. 22, from 10 to 10:45 a.m. in the Briefing Center Auditorium.

LUNCH WITH THE DIRECTOR OF: The next Lunch with the Director Of will be Wednesday, Aug. 28, noon to 1 p.m., Small Dining Room, building 15.

SEPTEMBER PUBLIC TOUR: The next Saturday tour, Sept. 6, will highlight the Aero-Acoustic Propulsion Laboratory, an echo-free dome designed for aircraft noise-reduction testing. Space is limited and reservations are required. To register, call 216-433-9653 or send an e-mail 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.

HONOR AWARDS CEREMONY: Mark your calendar for the 2013 NASA Honor and Center Awards Ceremony, Tuesday, Sept. 10, from 9 to 11:30 a.m. in the Hangar.

SAFETY AWARENESS DAY: The center will promote awareness of a safe and healthy workplace during the annual Safety Awareness Event, Thursday, Sept. 12, from 9:30 a.m. to noon in the Hangar.

Exchange Online Gift Shop
www.nasagiftshop.com

SUSTAINABILITY FAIR: The center will hold its annual Sustainability Fair, Wednesday, Sept. 18, 10 a.m. to 2 p.m. in front of building 3, near the flag pole.

POW/MIA EVENT: Glenn's Veteran's Awareness Committee will hold a POW/MIA observance event, Friday, Sept. 20 at 1 p.m. in the Ad Bldg. Auditorium. Dr. Stephen P. Johnson, historian with the Defense POW/Missing Personnel Office, is the featured speaker.

IMPROVE YOUR SPEAKING SKILLS: The Toastmasters International is a non-profit organization with clubs worldwide that help members develop communication and leadership skills in a supportive environment. Glenn's Toastmasters Club meetings are every Thursday at 12:05 in building 54, room 101.

National Aeronautics and Space Administration

John H. Glenn Research Center at Lewis Field
21000 Brookpark Road
Cleveland, Ohio 44135
www.nasa.gov

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 Community and Media Relations Office 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.

September issue copy deadline: Aug. 23, noon

Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

Read AeroSpace Frontiers online at http://aerospacefrontiers.nasa.gov

Glenn Provides Technical Expertise to Local Manufacturers

Following the success of the 2012 Manufacturing Innovation Project's (MIP's) Adopt a City Initiative with MAGNET (Manufacturing Advocacy and Growth Network), local manufacturers are lining up to learn how NASA Glenn's engineers could help solve technical challenges through the 2013 MIP.

Last year, eight manufacturers benefited from Glenn's expertise through the MIP partnership, formed between the city of Cleveland, Cuyahoga County, MAGNET and NASA. Three of the eight also took advantage of low-interest loans offered by the city and county to cover additional costs associated with the project.

"Many small- and medium-sized companies have ideas and concepts for new or improved product lines but lack the resources necessary to make the ideas come to fruition," said MIP Project Manager Carol Tolbert, Space Technology Project Office. "By working with knowledgeable NASA experts, the manufacturers can quickly get answers to technical questions that will enable them to better pursue their product lines, grow their companies and perhaps create jobs."

This fall, an independent panel of judges is expected to select and announce 10 new companies for this year's MIP.

Experts Solve Tough Challenges Through Partnership

Here are a few examples of how engineers helped the manufacturers solve their technical challenges:

• Identified a NASA polymer material and epoxy as potential candidates for an innovative dental implant system for crowns to reduce cost and time. If the company receives Food and Drug Administration (FDA) approval, this system can reduce the cost of a dental implant from $5,000 to $500 and can be inserted by a dentist instead of an oral surgeon.

To reduce costs and time, Glenn subject matter experts (SMEs) identified a NASA polymer material and epoxy as potential candidates for an innovative dental implant system for crowns.

• Reconfigured optics using commercial-off-the-shelf (COTS) components for a 3-D biomedical scanning microscope that matches the performance of higher cost microscopes. This will allow small universities/colleges and small- and medium-sized companies to be able to obtain a high-resolution 3-D optical capability at a fraction of the cost for biomedical research.

• Modernized circa 1960's and 1970's vinyl record presses to allow for higher output of old audio recordings. This is a multimillion dollar business in Cleveland that sells these recordings to audiophiles from around the world.

• Provided microstructural analysis of a watertight seal for a concrete foundation sensor that will revolutionize worldwide construction of buildings by providing real-time quality control during concrete curing. This same sensor system is being considered for health management of earthen dams and levees.

—By Doreen B. Zudell

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 9 SEPTEMBER 2013

SPF Modifications Bring Down the Temperature

Above the insulating atmosphere of the Earth, spacecraft are subjected to extreme temperatures—ranging from hundreds of degrees below freezing to hundreds of degrees above. Major refurbishments to the shroud system in the Space Power Facility (SPF) vacuum chamber at Plum Brook Station are underway to achieve temperatures—ranging from 250 degrees below zero to 150 degrees above zero—to simulate the harsh environment of space.

A team comprised of civil servant and support service contractors from Plum Brook and Lewis Field is

Continued on page 2

Photo by Larry Opper

Right: Technicians work 50 feet in the air to connect the cryo-shroud support structure to the vacuum chamber.

NASA, Industry Test 3–D Printed Rocket Engine Injector

C-2013-2527 Photo by Michelle Murphy

NASA's Glenn and Aerojet Rocketdyne of West Palm Beach, Fla. have completed testing on a rocket engine injector representing a significant milestone in additive manufacturing, or 3-D printing. Glenn conducted a series of hot-fire tests for Aerojet to demonstrate the ability to design and fabricate an injector —a highly critical rocket engine component—using high-powered laser beams to melt and fuse fine metallic powders into three-dimensional structures. This type of injector manufactured with traditional processes would take more than a year to make but with these new processes it can be produced in less than four months, with a 70 percent reduction in cost. To learn more about this collaboration and progress on this game-changing technology for future NASA missions visit http://www.nasa.gov/press/2013/july/nasa-industry-test-additively-manufactured-rocket-engine-injector/.

Left: Task Lead Tyler Hickman (in red shirt) and facility test engineers Diane Legallee and Jason Wendell, inspect the rocket injector assembly during installation in NASA Glenn's Rocket Combustion Laboratory.

In This Issue

Joint CFC and Sustainability Event

Join us at the 2013 NASA Glenn Sustainability and Combined Federal Campaign (CFC) Agency Fair & Block Party

Sept. 18, 2013

Serving Our Country
Supporting Our Community
Protecting Our Environment

See page 2 for details

Combined Federal Campaign & Green Earth Committees Team

Glenn's Combined Federal Campaign (CFC) Committee and Green Earth Committee are, again, joining forces for a combined event on Wednesday, Sept. 18, from 10:30 a.m. to 1:30 p.m. in front of building 3, near the flag pole.

At noon, Center Director Jim Free, the 2013 North Coast CFC Chairperson, will share his thoughts about CFC and sustainability, along with Glenn's Sustainability Officer and Director of the Facilities and Test Directorate Dr. Rickey Shyne.

The event features Glenn's 2013 CFC Agency Fair, Car Show and Block Party as well as the 2013 Sustainability Fair. Other highlights include the NASA Jam Band, free ice cream and local food trucks (stationed at building 3, instead of building 15).

Shuttle bus transportation will be available.

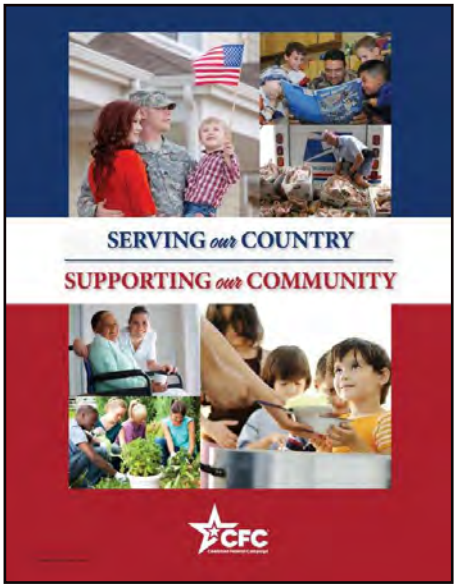
2013 Combined Federal Campaign Highlights

"Serving Our Country, Supporting Our Community"

North Coast CFC Chairperson: Jim Free
NASA Glenn Chair: Jackie Barbetta
NASA Co-Chair: Dawn Pottinger

Upcoming Glenn CFC Events

- September 18: CFC Agency Fair, Car Show and Block Party (Rain date: Sept. 24)
- September 19: CFC Kick-Off, building 3 auditorium
- October 25: Basket Raffle
- November Chili Cook-off
- December International Food Fair
- Pacesetter Campaign
  Be a Leader, Be a CFC Pacesetter!
  (Through Oct. 17)



SPF Modifications

Continued from page 1

refurbishing temperature panels for the vacuum chamber's shroud system. Many of the components were modified in Glenn's Fabrication Division, and local companies provided specialized services.

Photos by Larry Opper

Lead engineer Steve Sinclair inspects the massive lifting fixture before moving a shroud panel. The structure is comprised of panels and support beams.

SPF Facility Manager Jerry Carek said the size and complexity of the panels presented a number of challenges for the team. When completed, the structure, comprised of panels and support beams, will measure 40 feet in diameter and about the height of a 5-story building. The team used 20- and 30-ton cranes to lift and secure the structure, which suspends 50 feet from the ground.

"This team's ingenuity and engineering knowledge has dramatically saved time and effort in installing multiple components for the prime support structure that will be used for the shroud system," Carek explained. "Their 'out-of-the-box' thinking allowed them to modify existing hardware instead of starting from scratch."

The project is scheduled for completion in the November-December timeframe. In January, ATK will be the first customer to use the renovated shroud system to test their megaflex solar array. The facility and new shroud will also be used for Orion testing beginning 2015.

—By Doreen B. Zudell

The facility team prepares for lifting a 40-foot-long shroud panel. The team's ingenuity allowed them to modify existing hardware instead of starting from scratch.

LERCIP College Student/Mentors Close Out the Summer

On Aug. 1, college students in the Lewis' Educational Research and Collaborative Internship Project (LERCIP) and mentors gathered at the Lewis Field picnic grounds for certificates of completion and a final networking opportunity. Glenn's Center Operations Deputy Director Mary Lester gave welcoming remarks and introduced astronaut Stephanie Wilson, the featured speaker.

Wilson shared video highlights of her last shuttle flight aboard Discovery's STS-131 mission. She discussed her role and how the spirit of cooperation that transpires across all NASA centers and partnering countries to ensure mission success continues to inspire her.

Carletta McCoy (PATL), educational programs specialist, proudly acknowledged the spirit of cooperation among the interns that helped make this a memorable event.

"Despite the challenges of limited funds available this summer for LERCIP social events, the students focused on networking," McCoy said. "They designed and sold LERCIP T-shirts and solicited donations from local vendors for the picnic, as well as choreographed the entertainment."

This culminating event was one of a series of events and workshops planned by members of the Educational Programs Office, Paragon TEC, Inc./Team Momentum and a dedicated group of mentors who worked tirelessly to ensure Glenn interns have a rewarding summer experience.

—By S. Jenise Veris

Photos by Maurice Reynolds

Above: Wilson chats with interns and autographs her lithograph. Right: Intern Ayodeji Adesida, in LERCIP T-shirt, enjoys the picnic with his mentor, Dr. Robert Okojie, Sensors and Electronics Branch.

High School Interns: Expanding Minds and Opportunities

It was a busy summer for Glenn mentors and staff of the Educational Programs Office and Paragon TEC, Inc./Team Momentum, who hosted over 130 interns, including 29 Glenn High School Internship Project (GHIP) students.

In addition to tours, workshops, special seminars and work assignments offered in a traditional internship at Lewis Field and Plum Brook Station, several high school interns explored new opportunities beyond the gates.

"This year, Glenn's High School Internship Project placed greater emphasis on partnering with local organizations to foster awareness and prepare the next generation for science, technology, engineering and math (STEM) career opportunities in greater Cleveland," said Lynne Sammon, GHIP project manager.

NASA mentor Erwin Zaretsky, second from left, briefs GHIP/SBIR interns on NASA technology developed with a small, local company.

Two New Opportunities

In addition to offering the GHIP/Cleveland Clinic Internship, which provides STEM and medical educational experiences. Glenn, now, partners in the University Circle Inc.'s Future Connections (FC) Intern Program and a GHIP/Small Business Innovation Program (SBIR) pilot.

Throughout the summer, five GHIP students participated in the FC program, while another five interned in the SBIR pilot. The FC Intern Program provides 8-week paid internships to high school students entering their senior year from primarily Cleveland and Lorain school districts. Thirty-three local organizations partner to provide learning experiences, in 4-week increments, promoting personal and career development.

The GHIP/SBIR pilot paired them with mentors supporting the SBIR program as technical monitors for small business development in greater Cleveland. They toured and met managers and interns from four local businesses to understand what they do, how NASA technology can improve or advance their product, and learn about STEM career opportunities.

—By S. Jenise Veris

C-2013-3123 Photo by Bridget Caswell

Glenn Cáfe Opens

Employees celebrated the grand opening of the Glenn Café pilot program at Lewis Field on Aug. 1. Center Director Jim Free offered welcoming remarks to employees amid a backdrop of mellow music played by the NASA Jam Band and sizzling aromas from two food trucks. Eva the inflatable astronaut stopped by to mingle with employees as they eagerly waited in line and gathered at picnic tables to enjoy the fare. Be sure to check the Glenn Café Web site, http://www.grc.nasa.gov/WWW/glenncafe/, for updates on food services and vendors.

Centaur Material Wanted

The Glenn History Office is interested in any Centaur or other historical Glenn material—sans copies of *The Lewis News*—that former employees may wish to donate. There will also be a room available at the Centaur 50th Anniversary Celebration, Great Lakes Science Center, Nov. 22, where former employees can have their stories permanently archived by the Glenn History Office via oral histories. Contact Anne Mills for more information, anne.mills@nasa.gov or 216-433-8715.

C&I Hosts Priceline.com Co-founder

Glenn's Creativity and Innovation Initiative (CI&I) team welcomed Jeff Hoffman, co-founder of Priceline.com, as the Innovation Forum guest lecturer, Aug. 1. Hoffman spoke to the capacity crowd on the Art and Science of Innovation. He explained how the best innovation occurs when we allow ourselves to explore our surroundings with childlike curiosity—asking "why" or "what" about items we see on a daily basis. He shared inspiring examples of how managers who encourage a free flow of ideas identify efficiencies and generate new ideas for streamlining or innovation.

Support Educational Outreach

Glenn's Educational Programs Office (EPO) hosted an Information and Recruitment Fair, Aug. 13, in the upper level of the Café. Past presenters, mentors, tutors and event staff shared their experiences about supporting educational initiatives and outreach activities. Pictured is Nola Bland, detailed to the EPO, sharing information with Dionne Hernández-Lugo, Pathways intern. Contact the EPO at 216-433-6656 to learn how you can become involved year-round and "Inspire the Future"! Federal employees and retirees are needed as tutors, visit http://clevelandfeb.grc.nasa.gov/ for details.

Photo by Doreen B. Zudell

Photo by Doreen B. Zudell

GO-BIKE Club Supplies Needed Bicycles

For the past several weeks, the GRC GO-BIKE club has been involved in a public service project to collect unused/unwanted bicycles for refugees the United Nations, in association with Catholic Charities and Building Hope in the City, bring to resettle in the greater Cleveland area. They use the bicycles as a cost-saving alternative to riding the bus. Due to the generosity of Glenn employees, the club has donated 74 bikes, so far. Pictured, left to right, are a few of the GO-BIKE members, Dale Stalnaker, Dale Force, Marilyn Groff and Mark Kilkenny, with two of the bicycles to be donated. For more information about this project, visit http://www.grc.nasa.gov/WWW/AdvisoryGroups/GO-BIKE/.

Technology on the Hill

Trudy Kortes, Space Technology Project Office, and Dr. Dave Manzella, Space Propulsion Branch, served as NASA Glenn's technical point of contacts at the 2013 NASA Technology Day on the Hill, July 23. They briefed Congressional members, NASA managers and the public on recent developments in NASA's Cryogenic Propellant Storage and Transfer Project and solar electric propulsion technology related to the Asteroid Redirect Robotic Mission. Other Glenn-related technology displays included: green propellent, additive manufacturing, PUMA and fuel cells. Pictured: NASA Administrator Charlie Bolden and Representative Dana Rohrabacher, vice chairman of the House Committee on Science, Space and Technology, are briefed by Manzella on Glenn solar electric propulsion work.


Credit: NASA Game Changing Technology


Photo by Marvin Smith

Next Issue: More About Australian Ambassador Visit

The Honorable Kim Christian Beazley, Australia's Ambassador to the United States, along with various ministers and managers from the Embassy of Australia and the U.S. Air Force Office of Scientific Research, recently visited NASA Glenn. Pictured: Dr. Daniel Sutliff (facing the group) engages the guests during a tour of the Aero-Acoustic Propulsion Laboratory. Left to right: Dr. Jih-Fen Lei, Research & Technology director; Dr. Torgny Josefsson, Embassy of Australia; Dr. Ali Sayir, U.S. Air Force; the Ambassador and his wife Ms. Suzanna Annus; and Center Director Free. Look for more information about the Ambassador's visit in the October issue.

Correct Hand Washing Combats Germs

Good hand washing is the first line of defense against the spread of many illnesses, from the common cold to more serious illnesses such as meningitis, bronchiolitis, influenza, hepatitis A and most types of infectious diarrhea.

"Germs can be transmitted in many ways throughout the course of a day, so thorough hand washing practices are essential to combatting germs that can cause illness," explained Burt Stover, nurse coordinator in Glenn's Occupational Health Clinic/FOH.

When should you wash your hands? Stover recommends washing anytime you touch a surface that might be contaminated. In particular good hand washing is important before and after preparing as well as eating food, when caring for someone who is sick, and after using the rest room or when changing diapers. Always remember to wash your hands or use hand sanitizer after blowing your nose or coughing. And, a thorough hand washing is essential after touching, feeding or cleaning up after the family pet.

Over the coming months, the Occupational Health Clinic staff will promote the value of hand washing and general wellness practices throughout the center in addition to dispensing seasonal flu shots. When you meet them, be sure to ask your health-related questions.

—By Doreen B. Zudell

Hand Washing Essentials

• Use soap and water to wash hands whenever possible (antibacterial or regular soap) • Rub hands together to make a good lather and scrub them well. Clean in between fingers and top of hand • Wash hands for at least 20 seconds (sing the "Happy Birthday" song twice) • Rinse the back of hands well to remove soap that can cause dry, cracked skin • Dry hands using a clean towel or air dryer • Assist children in washing their hands • Carry a portable hand sanitizer (containing 60 percent alcohol) in your purse or car if soap and water are not accessible.

Awards and Honors

Dr. Meador

The American Chemical Society (ACS) has elected Dr. Mary Ann Meador, Durability and Protective Coatings Branch, to the rank of fellow. Meador is recognized for technical contributions to the understanding of cure and degradation mechanisms in high-temperature polymers; and the invention of polymer silica hybrid aerogels and polymer aerogels for use in aerospace applications; as well as contributions to the society serving as counselor and associate editor of the peer reviewed journal, *ACS Applied Materials and Interface*.

"Men in Blue," an image taken at NASA Glenn's first Web Social celebrating the 50th anniversary of John Glenn's orbital flight of Friendship 7, earned an Award of Excellence by the APEX 2013 Communications Concepts group. The photographer, Gary Nolan, WYLE/ Imaging Technology Center, supported the Social led by Glenn's Web Portal team of Kathy Zona, Nancy Kilkenny (SGT) and Kelly Heidman (WYLE). This image and others from the event, are available at http://www.nasa.gov/centers/glenn/multimedia/imagegallery/if_82_bluemen.html.

C-2012-1377 Photo by Gary Nolan

Pictured, left to right, former astronaut Steve Lindsey with three of John Glenn's fellow Ohio astronauts Greg Johnson, Mike Foreman and Mike Good.

Welcome to the NASA Family

Left to right: Piasecki, Green, Smith, Hau and Roberts.

Aretskin-Hariton, left, and Fawcett.

Schmitt, left, and O'Diam.

The center welcomed the following Pathway Interns and new employees who reported for duty/orientation during the month of July: Eliot Aretskin-Hariton, Controls and Dynamics Branch; Carrie Green and Matthew Smith, Reliability and System Safety Engineering Branch; Michael Fawcett, Exploration Systems Project Office; Yu Hin Hau, Energy Systems Branch; Tyler O'Diam, Wind Tunnel and Propulsion Test Branch; Marie Piasecki, Antenna and Optical Systems Branch; Anthony Roberts, Aerospace Communications Systems Branch; and Michael Schmitt, Durability and Protective Coatings Branch.

In Appreciation

My family and I would like to thank my Glenn co-workers and friends who provided support, prayers and expressions of sympathy on the recent loss of my dad. Your heartfelt sentiments provided comfort to us all during this sad time.

—Debbie Findley and Family

I wanted to take a moment to thank everyone who supported me during my recent illness. I was overwhelmed with the love and support I received during this very trying time in my life. To everyone who donated leave to me—I don't know how to thank you enough for your generosity. The prayers, cards, donations, meals for my family and other support were such a blessing during this time. I appreciate you all from the core of my being and I am eternally grateful.

—Marie Krejci (Borowski)

Vincent J. DiPiazza, 92, who retired with 40 years of federal service, died March 17. He was a Purple Heart veteran who served in the U.S. Army during WW II, and later retired from the Air Force Reserves. DiPiazza repaired research instruments and performed complex strain gage applications for specialized cryogenic and high-temperature applications as a NASA technician supporting the Technical Services Section of the Fabrication Division.

Dunn

James H. Dunn, 91, who retired in 1982 with 33 years of federal service, died May 24. Dunn was a U.S. Navy veteran of WW II, who retired from NASA's Planning Analysis and Systems Office, Energy Directorate, after 30 years of service. He was a mechanical engineer who performed tests and analysis on turbocompressor equipment and authored/co-authored numerous technical reports about developing power for manned space flight, particularly the Brayton Power System.

Joseph R. Kubancik, 92, who retired in 1984 with 26 years of NASA service, died April 2. Kubancik was a technician who retired from the Launch Vehicles Section. Kubancik was a dedicated employee and determined part-time student, who earned a bachelor's degree from John Carroll University (1971), in an unrelated field 20 years into his career. His brother, Frank, a NASA retiree, preceded him in death, March 2011.

Previte Remembered as a Creative, Fun-loving Colleague

Previte

Matthew A. Previte, 54, a senior designer at ZIN Technologies Inc. (ZINT), died suddenly, July 18. Previte worked in the aerospace industry over 27 years, including 14 years at ZINT supporting NASA Glenn space flight experiments.

Previte was the lead designer of several active NASA Glenn experiments, including the Observation and Analysis of Smectic Islands in Space Experiment, Coarsening in Solid Liquid Mixtures, Space Acceleration Measurement System, Binary Colloidal Alloy Test and the Preliminary Advanced Colloids Experiment.

"As lead of the design group at ZINT, Matt refined standards and initiated improvements to the products employing his characteristically 'out-of-the-box' vision for which he received several awards," said Jim Bruewer, ZINT vice president of Engineering. "He was a great friend, colleague and mentor who will be sorely missed."

Dr. Robert L. Thompson, 75, who retired in 1994 with 35 years of federal service, died May 4. Thompson was a U.S. Army veteran, who retired from NASA as a manager in Glenn's Space Experiments Division. During his 33-year career at NASA, Thompson earned two advanced degrees and became a senior research scientist focused on structural analysis. He was program manager for the Combustor Liner Test Facility used to predict gas turbine engine liners stress and strain.

Dr. Thompson

Calendar

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SEPTEMBER PUBLIC TOUR: The next Saturday tour, Oct. 4, will highlight the Telescience Support Center, where engineers provide operations support for space experiments on the International Space Station. Space is limited and reservations are required. To register, call 216-433-9653 or send an e-mail to sheila.d.reese@nasa.gov. For more information, visit http://www.nasa.gov/centers/glenn/events/tours.html.

Exchange Online Gift Shop
www.nasagiftshop.com

HISPANIC HERITAGE: The Hispanic Heritage Month Observance will be held Oct. 10 at 10 a.m. in the Ad. Bldg. Auditorium. Dr. Yajaira Sierra-Sastre, Cornell University, will speak on the HI-SEAS (Hawaii's Space Exploration and Simulation) Program.

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October issue copy deadline: Sept. 20, noon

Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

Glenn, Nation Benefit From Being Recycling Savvy

New Programs Save Thousands

There are many benefits of recycling, but it takes research and ingenuity to operate an efficient and fiscally effective recycling program. So NASA Glenn's Logistics and Technical Information Division (LTID) has learned the value of being "recycling savvy."

For example, since a pound of segregated copper can generate 100 times the revenue of a pound of mixed metals, LTID recently initiated a scrap metal recycling program to offset the recycling costs of the solid waste contract.

Gail Starcher, COR of the solid waste contract, coordinated with employees at Lewis Field in buildings 49, 50, 51 and at the Plum Brook Station Shipping and Receiving facility to segregate specific types of high-value metals after it was determined that a standard "mixed metal" rate was paid for all metals recycled through the contract.

"Working with the solid waste contractor and NASA employees, we piloted a program to separate the various scrap metals (molybdenum, titanium, nickel alloys, stainless steel, copper, brass and aluminum) instead of placing them all together in one container," Starcher explained. "By separating the metals, NASA now receives the current value of each type of metal instead of the lower 'mixed metal' rate."

Left to right: MacKay, Ubienski and Starcher stand by recycling containers marked to separate scrap metal.

Gregory Blank, Frank Bremenour, Michael Cawthon, Rebecca MacKay and Timothy Ubienski at Lewis Field, along with Max "Lee" Early and Catherine Jensen at Plum Brook were key in planning and implementing this pilot program, Starcher said. She estimates the program will significantly increase revenue generated from the scrap metal recycling program; consequently, greatly increasing the revenue used to offset the recycling costs of the solid waste contract.

LTID implemented another cost-savings measure when the new solid waste contract began this fiscal year. Solid waste dumpsters are now emptied three times a week instead of daily.

"As a result, the new contract was awarded with an overall savings of more than 20 percent from the previous contract, and greenhouse gas emissions are also reduced by 40 percent due to the reduced transportation activity," Starcher said.

Employees interested in participating in the scrap metal segregation program, or other recycling and solid waste reduction efforts can contact Starcher at 216-433-3644.

Visit the new Waste Management/ Recycling Services web page at http://ltid.grc.nasa.gov/.

—By Sandy Valenti and Doreen B. Zudell

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 10 OCTOBER/NOVEMBER 2013

The government shutdown affected publication of the October *AeroSpace Frontiers*. See page 2 for details.

New Home for Shipping and Receiving Services

NASA Glenn's new Shipping and Receiving Facility, or SaRF, will become fully operational Nov. 25. This is the final of three planned phases to Lewis Fields' main gate security enhancement effort in accordance with the Facility Master Plan.

The 12,700-square-foot building facilitates the receiving, documenting, screening and distributing of materials and equipment throughout Lewis Field, as well as the inspecting and sorting of incoming mail. The new SaRF is located in the front perimeter of the campus and outside the main gate. This allows for a significant reduction in truck traffic through the campus and improved traffic patterns at the main gate for all vehicles entering and exiting Lewis Field. To gain access to the facility, employees follow the Truck Inspection loop off NASA Parkway to the parking lot entrance where they will need to scan their badges.

SaRF is located in the front perimeter of the Lewis Field campus and outside the main gate.

C-2013-3100 Photo by Bridget Caswell

"I'm excited about the opening of SaRF, as many individuals have worked very hard to design and construct this premier facility," said Glenn Transportation Officer and Mail Manager Dr. Antoine Moss, Logistics and Technical Information Division

Continued on page 2

Glenn Celebrates NASA Agency Honor and Center Awards

NASA Glenn employees received 70 Honor Awards, 28 Agency Awards and 28 Center Awards. See page 6 for a listing of honorees.

C-2013-4066 Photo by Bridget Caswell

In This Issue

Australian Ambassador to U.S. Visits Center

On Aug. 27, Center Director Jim Free welcomed Australian Ambassador to the U.S., the Honorable Kim Beazley, his wife Susanna Annus, members of the Australian embassy and representatives of the U.S. Air Force Office of Scientific Research (AFOSR) for a full day of activities at Lewis Field and Plum Brook Station. The visit was designed to provide a general understanding of Glenn's technical capabilities and to identify opportunities for research collaboration.

The Ambassador's visit came on the heels of recent activities, involving Dr. Jih-Fen Lei, Dr. Michael Meador and Dr. Felix Miranda, to establish basic research collaborations related to Glenn nano-fabrication technologies in advanced materials, sensors, electronics and communication devices with Australian universities, the Commonwealth Scientific and Industrial Research Organization, the Australian National Fabrication Facility and the AFOSR.

Dr. MaryAnn Meador demonstrates polymers fabricated in her laboratory for the Ambassador (foreground), other guests and Glenn senior managers.

Following a center overview and introductions to senior staff, the Ambassador and other special guests toured eight of Glenn's world-class facilities determined to offer the greatest potential for collaboration.

To date, Australia's most notable collaboration with NASA has been hosting one of the agency's three Deep Space Network stations: the Canberra Deep Space Communication Complex at Tidbinbilla, Australian Capital Territory. NASA and partners in the High Ice Water Content project, including Australia's Bureau of Meteorology, will participate in a flight campaign at Darwin, Australia in the Jan.–March 2014 timeframe to characterize atmospheric conditions related to aircraft engine icing.

By S. Jenise Veris

SaRF

Continued from page 1

(LTID). "Our LTID personnel look forward to continuing to provide the Glenn community excellent institutional support and services through SaRF."

The building incorporates sustainability design strategies as well as energy conservation and reduction principles to achieve a Leadership in Energy and Environmental Design (LEED) Gold Certification for New Construction from the U.S. Green Building Council. This effort encompasses the integration of civil, architectural, structural, mechanical, plumbing, fire protection, electrical, security access and data and communication systems disciplines.

By Jeff Schultz & Doreen B. Zudell

Services to Relocate From Building 21 to SaRF, Building 152:

Shipping
Receiving
Transportation Dispatch
Mail Center
Supply Management

Hours of Operation (Beginning Nov. 25):
Monday through Friday, 7 a.m. to 4:30 p.m.

Presenting....

Special Combined AeroSpace Frontiers

Did you miss reading your *AeroSpace Frontiers* in October?

Due to the government shutdown, the NASA Glenn *AeroSpace Frontiers* staff was unable to publish the October 11 issue. To make sure our readers didn't miss a beat, we combined the October and November issues into one exciting 16-page publication.

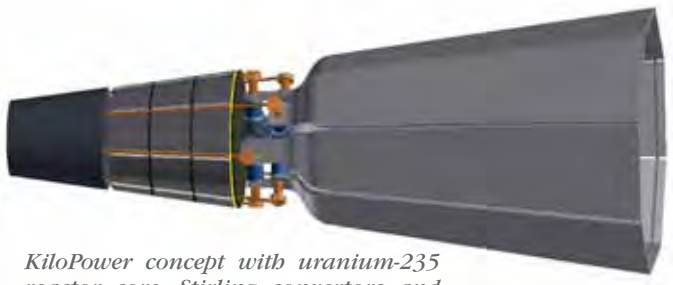
We hope you enjoy reading this special October–November edition.

Kelly R. DiFrancesco
Doreen B. Zudell
S. Jenise Veris

NASA Glenn Earns Two R&D 100 Awards!

Center's Total R&D Awards Rises to 116

NASA Glenn researchers who teamed with industry in developing two technologies are being recognized among the nation's 100 most important technological innovations at this year's *R&D 100* Awards Ceremony, Nov. 7, in Orlando, Fla.



KiloPower concept with uranium-235 reactor core, Stirling convertors and radiators.

Courtesy of NASA

The end of the Cold War resulted in a shortage of plutonium-238, previously used in radioisotope thermoelectric generators (RTGs) that powered numerous space probes like the Curiosity rover on Mars, the Cassini-Hyugens to Saturn and Galileo and Pioneer-10/11 to explore Jupiter and other planets in our solar system. However, the collaboration of NASA Glenn and National Security Technologies led by Los Alamos National Laboratory has developed an alternative type of space nuclear power system. Known as **KiloPower**, it uses plentiful uranium-235 as the heat source, along with a cluster of small Stirling power convertors capable of generating 500 to 1,500 watts of electricity for extended space missions.

Courtesy of Harris Corp.

The Ka-Band SDR before installation of the SCaN testbed.

The NASA/Harris Corporation's **Ka-Band Software-Defined Radio** (SDR) was chosen for being the first, fully reprogrammable space-qualified SDR operating in the Ka-band frequency range via NASA's Space Communications and Navigation (SCaN) Testbed aboard the International Space Station. Providing higher data communication rates than previously possible, this space SDR offers in-orbit reconfiguration, multi-waveform operation and fast deployment through modular hardware and software. It also offers potential for development cost, risk and scheduling reductions.

The names and photos of the NASA employees who contributed to these award-winning technologies can be found in the NASA Honor Awards section on page 11. Additional information on these technologies and other 2013 *R&D 100* winners is available on the *R&D* website: http://www.rdmag.com/award-winners/2013/07/2013-r-d-100-award-winners. Glenn researchers seeking information on submissions for future nominations should contact Kim Dalgleish, Innovation Projects Office, 216-433-8047.

Stirling Research Lab Reaches Operation Milestone

On Aug. 25, NASA Glenn's Stirling Research Laboratory (SRL) surpassed 600,000 hours of cumulative convertor operations. This helps advance state-of-the-art free-piston Stirling energy conversion systems for aerospace and nonaerospace applications. These systems can be used for spacecraft exploration over long mission durations, where solar power is not feasible.

The SRL has 14 test stations permitting 24/7 operation of up to 28 convertors for performance verification testing of components and systems to validate design methods and analytical predictions. Members of the Thermal Energy Conversion Branch have been testing two models of free-piston Stirling convertors: the 55 W Technology Demonstration Convertor (TDC), manufactured by Infinia Corp., Kennewick, Wash., and the 80 W Advanced Stirling Convertor (ASC), manufactured by Sunpower, Inc., Athens, Ohio.

Stirling Research Lab personnel, left to right, Wayne Wong, Scott Wilson (seated), James Withrow, and Salvatore Oriti discuss ASC-E3 test results.

The longest operating convertor has been running for over 78,000 hours, compared to the typical automobile engine that accumulates about 3,000 hours of operation. Cumulative testing of the convertors began in 2001 with the TDCs, then the ASCs in 2007, followed by the latest model, ASC-E3, in January 2013.

The ASC extended operation test data supports life certification for the Advanced Stirling Radioisotope Generator project, which hopes to develop a flight system to support NASA science missions before the end of the decade.

A 50-Year Anniversary

Centaur Rocket:

(Photo left) The Centaur upper stage rocket being readied for testing in the B-2 Facility. (Above) Summer interns at Plum Brook Station work on Centaur's RL-10 engines.

Interns Refurbish Centaur Hardware

Two LERCIP students assigned to Plum Brook Station this summer worked on restoring the RL-10 rocket engines used on the Centaur display.

With the aid of historical manuals, drawings and NASA mentors, Daniel Meter, majoring in aerospace engineering at The Ohio State University, and David Carson, majoring in civil engineering at Tuffs University, replaced valves and piping on the display's upper stage engines.

Not a bad way to craft their engineering skills!

Centaur has enormous historical significance to Lewis/Glenn and the U.S. space program—

- The workhorse upper stage for NASA's most ambitious exploration missions
- The first application of liquid hydrogen as a rocket fuel (RL-10 engine)
- The main career experience for many Lewis/Glenn employees and center leaders

The Exchange Store is offering special Centaur-themed shirts. To shop online, visit www.nasagiftshop.com.

America's Workhorse in Space

Nov. 27 marks the 50th Anniversary of the first successful launch of NASA Lewis/Glenn-managed Centaur upper stage rocket.

Centaur was the world's first high-energy upper stage to burn liquid hydrogen (LH_2) and liquid oxygen (LOX). Lewis' development of liquid hydrogen in the 1950s and early 1960s paved the way for the propellant's use on not only the Atlas-Centaur, but also the upper stages of Saturn rocket and the space shuttle main engine.

NASA Glenn was assigned responsibility for the Centaur Program in October 1962. Glenn engineers put the vehicle through a rigorous 2-year test and evaluation program which resulted in the successful Surveyor missions to the moon in the mid-1960s. Centaur, known as America›s Workhorse in Space, has been used to boost scores of satellites into orbit, propel the first U.S. spacecraft to the moon, and send spacecraft to every corner of the universe. Fifty years after its first successful launch, the Centaur stage continues to reliably launch a variety of payloads into space.

For more than 20 years, NASA Glenn was responsible for Centaur's launch schedule, trajectories, payload integration, and coordination with other NASA centers, customers, and vehicle and engine manufacturers General Dynamics and Pratt & Whitney, respectively. During that period the Centaur vehicle continued to evolve, including its pairing with the Titan IV booster for the Viking and Voyager launches in the mid-1970s. In the early 1980s, Centaur was reconfigured to fit into the space shuttle's payload bay, but the program was cancelled in the wake of the Challenger incident. Shortly thereafter, NASA decided to relinquish control of its launch services to private industry. Glenn, however, continued to oversee Centaur launches, which carried government payloads until the Cassini mission in 1997.

Although its name is not used in the commercial Atlas or Titan families of launch vehicles, the Centaur continues to serve as America's most powerful upper stage for these rockets. In 2011, an Atlas-5 with a Centaur upper stage sent the Curiosity rover to Mars.

To learn more about Centaur, visit these sites:
http://www.nasa.gov/centers/glenn/about/history/centaur.html
http://www.nasa.gov/centers/glenn/about/history/centaur_anniv.html
Taming Liquid Hydrogen: The Centaur Upper Stage Rocket, 1958-2002: http://history.nasa.gov/SP-4230.pdf.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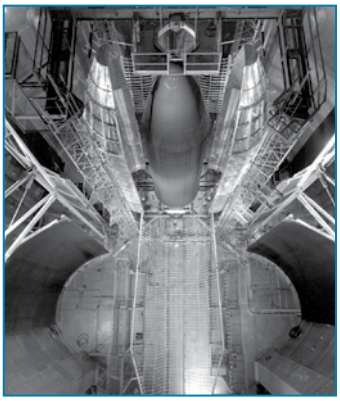
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Join the Community Celebration!

Mark your calendar for Friday, Nov. 22, to gather at the Great Lakes Science Center (GLSC) in Cleveland to celebrate the 50th Anniversary of the first successful launch of the Centaur rocket, America's workhorse in space!

Come learn about Centaur's rich history, including NASA Glenn's role in perfecting its performance and using it for more than 100 launches, from an impressive line up of guests—such as former NASA Glenn center directors, Larry Ross and Andrew Stofan, as well as industry representatives. NASA Associate Administrator Robert Lightfoot will share highlights of NASA's future in space exploration. Center Director Jim Free will provide opening remarks.

Special Centaur Anniversary Program
Space Saturday, Nov. 23
10 a.m. to 5 p.m.
Great Lakes Science Center

All festivities will be inside the NASA Visitor Center at the GLSC. Doors open at 5:30 p.m. for the reception, when guests will have an opportunity to mingle and explore the NASA galleries. Dinner begins at 6:30 p.m. For more information on the event, registration and ticket purchasing, please visit www.oai.org/Centaur50th.

(Photos right, top to bottom) Centaur 6A being prepared for testing at Lewis; Atlas-Centaur vent test in 10- by 10-Foot Supersonic Wind Tunnel; Centaur Standard Shroud in Space Power Facility; Atlas-Centaur-2, the first launch on Nov. 27, 1963.

On Wednesday, Sept. 11, Scott Altman, former NASA astronaut and vice president of ASRC Federal Space and Defense (pictured with the 3rd Battalion, 25th Marine honor guard), addressed the honorees and joined Center Director Jim Free in presenting the agency and center awards.

OUTSTANDING LEADERSHIP MEDAL

Ruben Del Rosario
For sustained leadership and exceptionally high-impact achievements in the development strategy to NASA research projects for commercial subsonic transport technologies.

Linda D. Dukes-Campbell
For exceptional leadership of dynamic media and outreach teams at the NASA Glenn Research Center. Her 22-year legacy remains a benchmark for NASA media managers to emulate.

Carol A. Ginty
For outstanding leadership of significant Agency projects including Space Environmental Test, Commercial Space, and Cryogenic Propellant Storage and Transfer.

Julie A. Grantier
For exceptional and sustained leadership while serving as the technical lead for the European Space Agency Service Module team.

Glen M. Horvat
For exceptional and sustained leadership while serving as the GRC Senior Spaceflight Chief Engineer.

Mark W. Manthey
For outstanding and sustained leadership in the Procurement Division, resulting in significant improvements in contractual products and services to the Glenn Research Center.

Laura A. Maynard-Nelson
For outstanding leadership in the advancement of the software engineering discipline to meet NASA's missions and goals.

Carolyn R. Mercer
For exemplary service as the Space Power Systems Project Manager, Human Spaceflight Architecture Technology Team member, and SBIR Space Power Subtopic Lead.

Steven R. Oleson
For sustained outstanding leadership of the Collaborative Modeling for Parametric Assessment of Space Systems Team in developing innovative conceptual spacecraft designs.

David J. Steigman
For exceptional leadership and innovation in effectively managing resources and services critical to achieving Agency objectives and program milestones.

James J. Zakrajsek
For exceptional leadership in promoting a creativity and innovation culture at Glenn Research Center, managing people, and leading the Source Evaluation Board.

OUTSTANDING PUBLIC LEADERSHIP MEDAL

Brian W. Rice
For outstanding leadership in support of the test facilities and operations at NASA Glenn Research Center's Lewis Field and Plum Brook Station.

EXCEPTIONAL SERVICE MEDAL

Jeffrey S. Balser
For sustained outstanding service in advanced aircraft technology development through NASA research programs and collaboration with other government organizations.

Robert M. Button
For exceptional service as an Electrical Engineer working to meet NASA's mission requirements and goals.

Frederick W. Elliott
For sustained exceptional service on the Space Environmental Test project, Cryogenic Propellant Storage and Transfer project, and the Multi-Purpose Crew Vehicle program.

Patrick A. Iler*
For exceptional service in managing initiatives that provide transparency to external stakeholders and advance the reputation of the Agency, thereby serving the NASA mission.

Eric S. Neumann
For exceptional technical leadership and service in the management and operation of microgravity test facilities in support of NASA missions.

**Photo unavailable.*

Kenneth M. O'Connor

For exceptional service in leading the Mishap Investigation Support Office, and the NASA Safety Center, and for invaluable contributions to the Safety and Mission Assurance community.

Calvin T. Ramos*
For exceptional technical excellence and service in supporting the Aerospace Communications Competency workforce, projects, and missions at NASA Glenn and the Agency.

Andrew L. Reehorst

For sustained contributions and impact for improving aviation safety in the field of in-flight icing.

William R. Schoren

For dedication and technical excellence in implementing system safety processes to ensure human safety, asset integrity, and mission success for NASA programs and projects.

EXCEPTIONAL PUBLIC SERVICE MEDAL

Robert S. Arrighi

For exceptional achievement in documenting, preserving, and promoting the rich history of NASA, its mission, and its valuable historical cultural resources.

E. Allen Arrington

For exceptional technical contributions to the Nation's wind tunnel testing community.

EXCEPTIONAL ACHIEVEMENT MEDAL

Brett A. Bednarcyk

For exceptional contributions to the state of the art of efficient multiscale analysis of advanced composite materials and structures.

Konstantinos S. Martzaklis*
For outstanding leadership in developing and delivering a comprehensive Strategic Action Plan for the Glenn Research Center.

Claudia M. Meyer*
For exceptional achievement in formulating and executing the NASA Space Technology Research Grants Program and developing the next generation of space technologists.

Linda J. Moore

For the exceptional achievement of developing Agency-wide guidance for the development of programmable logic devices and complex electronics.

David S. Morgan*
For exceptional achievement, dedication, and technical excellence in establishing nondestructive evaluation techniques and solutions for heater heads on the Advanced Stirling Radioisotope Generator Project.

Vincent E. Satterwhite

For exceptional achievement in the advocacy, development, and leadership provided to the technician apprenticeship program.

Kathleen E. Schubert*
For exceptional leadership resulting in a European-Space-Agency- (ESA-) provided Multi-Purpose Crew Vehicle Service Module implementing arrangement and successful completion of the ESA Service Module System Requirements Review and Systems Definition Review.

Robert J. Shaw

For the exceptionally successful promotion of the applicability of NASA's technology to critical sectors of our Nation's economy.

Del R. Simonovich

For outstanding leadership and innovation managing several complex, multiphase security projects and enhancements, which have elevated the Center's security posture.

Rodney L. Spence

For outstanding support to the Space Communications and Navigation program for interference analysis to assess potential impacts to NASA from proposed Nation-wide commercial broadband deployments.

Bryan W. Welch*
For outstanding leadership and contributions to the Communications System Engineering and Antenna Pointing System efforts of the Space Communications and Navigation Testbed.

James P. Withrow

For outstanding achievement to integrate and manage NASA's support to complete and verify the design of the Advanced Stirling Radioisotope Generator.

EXCEPTIONAL PUBLIC ACHIEVEMENT MEDAL

James D. May

In recognition of outstanding contributions in advancing the effectiveness and impact of technical excellence for NASA Safety and Mission Assurance.

Vedha Nayagam

For exceptional achievements in droplet combustion phenomena and in reacting systems in reduced gravity for advanced life-support systems.

Dawn M. Vincej

For exceptional commitment to NASA's Information Technology community on multiple projects and initiatives.

EXCEPTIONAL ENGINEERING ACHIEVEMENT MEDAL

Patrick H. Dunlap

For exceptional engineering achievement in developing and demonstrating advanced environmental seal design for the International Low Impact Docking System.

**Photo unavailable.*

EXCEPTIONAL SCIENTIFIC ACHIEVEMENT MEDAL

Rebecca A. MacKay
For pioneering insights into single-crystal nickel-base superalloy behavior, leading to the development of new turbine blade alloys.

James L. Smialek
For advancing the understanding of failure mechanisms for thermal barrier coatings on turbine blades to enable more durable turbine blade coatings.

EXCEPTIONAL TECHNOLOGY ACHIEVEMENT MEDAL

Colin S. Bidwell
For sustained leadership and successful development of the LEWICE3D Computational Fluid Dynamics code and technology transfer to external organizations.

Paul S. Greenberg
For exceptional and innovative technology achievements and technology transfer in aerosol sensors and microgravity diagnostics and their profound impact on human exploration.

Robert A. Miller
For contributions to development of erosion-resistant thermal barrier coatings and methods to demonstrate their durability in laboratory-simulated turbine engine environments.

EXCEPTIONAL ADMINISTRATIVE ACHIEVEMENT MEDAL

Helen J. Kabak*
For continuous and substantial improvements to the Center Operations Directorate administrative procedures, thereby enabling senior leaders to excel in meeting NASA's mission.

Lynne M. Wiersma
For exceptional leadership and administrative services to the Glenn Research Center.

EARLY CAREER ACHIEVEMENT MEDAL

Adam E. Bihary
In recognition of significant facilities project management and engineering contributions to fulfill the mission of the Glenn Research Center.

Brent G. Gardner
For the development of systems, controls, and components for the next generation of aerospace power systems necessary to meet NASA's mission.

Daniel A. Herman
For outstanding early career performance and leadership in electric propulsion and strategic development and planning for NASA's Solar Electric Propulsion Technology Demonstration Mission.

Heather K. Hickman
For exceptional contributions in the area of in-space propulsion on highly visible NASA programs.

John E. Hild
For outstanding achievement developing innovative security design improvements resulting in more efficient operations and significant cost savings for 22 construction projects.

Ra-Deon L. Kirkland
For outstanding professional and personal achievements in contract support to NASA and GRC projects and programs.

Ashley G. Murry
For developing innovative improvements to capital asset business processes and contributing to improvements in NASA's accounting and financial analysis practices.

William D. Peters
For exceptional dedication and technical excellence in providing materials, processes, and risk management to the G-6 Flywheel and Flow Boiling and Condensation Experiments.

Vikram Shyam
For significant achievement and team leadership in the development of turbine heat transfer and Computational Fluid Dynamics technology.

GROUP ACHIEVEMENT AWARDS

Buildings 500 and 501 Clean-up Team

For exceptional efforts in executing and expediting all actions associated with the closure and transfer of Buildings 500 and 501.

Crew Module Pallet Vibration Test Team

For outstanding achievement in successfully conducting the Multi-Purpose Crew Vehicle, Crew Service Module Project, and Crew Module Pallet Vibration Test.

Cryogenic Fluid Management Technology Maturation Team

For exceptional achievement in successfully maturing cryogenic fluid management technology for use on future Agency missions involving cryogenic propulsion stages.

Curiosity Education and Outreach Team

For exceptional development and execution of the Glenn Research Center Curiosity Education and Outreach Plan, which informed and engaged the public about the August 2012 Mars landing and mission.

Glenn Creativity & Innovation Team

For outstanding effort in promoting, organizing, and implementing a multifaceted initiative to enhance creativity and innovation culture within the Glenn Research Center.

**Photo unavailable.*

GRC COMPASS Concurrent Engineering Design Team
For creating a Glenn Research Center capability of advanced space systems concept design, assessing space technology utilization, and integrated vehicle analysis for challenging NASA missions.

John Glenn's 50th Anniversary Planning Team
For outstanding planning and coordination of a historic event celebrating the 50th anniversary of John Glenn's orbital flight.

Mobile Cooling Tower Project Team
For the efforts of the Mobile Cooling Tower Project Team resulting in a significant reduction in water use and substantial avoidance of cost.

Multi-Purpose Crew Vehicle Service Module Implementing Agreement Team
For outstanding efforts which led to the establishment of the NASA-European Space Agency implementing arrangement for the Multi-Purpose Crew Vehicle Service Module.

NASA Glenn Special Journal Issue Team
For outstanding efforts in the publishing of a special issue of the Journal of Aerospace Engineering honoring the 70 years of research and technology at Glenn Research Center.

NASA Twin-Otter Airborne Sensor Development Team
In recognition of outstanding achievement conducting the modification and deployment of the NASA Twin-Otter aircraft, advancing airborne science capabilities within the Agency.

Occupational Health Service Provider Research Team
For exceptional achievement in formulating and implementing an alternative and cost-effective approach for delivering quality medical services and wellness programs to GRC.

SEPP Process Improvement Team
For the Science and Engineering Promotion Process Team's efforts in significantly improving the process for Dual Career Ladder promotions of Glenn Research Center scientists and engineers.

Space Technology Research Grants Group
For exceptional success in stimulating innovation and accelerating the development of promising technologies through novel research fellowships and early career opportunities.

Travel Request/Purchase Requisition Consolidation Team
For outstanding contributions to Center efficiency in consolidating Travel Request and Purchase Requisition business practices into a single business unit.

PRESIDENTIAL RANK AWARD
The President of the United States of America has conferred upon

Rickey J. Shyne
the rank of Meritorious Executive in the Senior Executive Service for sustained superior accomplishment in management of programs of the United States Government and for noteworthy achievement of quality and efficiency in the public service.

The President of the United States of America has conferred upon

Isaiah M. Blankson
the rank of Distinguished Senior Professional for sustained extraordinary accomplishment in the conduct of programs of the United States Government and for professionalism exemplifying the highest standards of service to the public, reflecting credit on the career civil service.

LENGTH OF SERVICE AWARDS
FORTY-YEAR SERVICE AWARD
Michael T. Chornak
Space Power and Propulsion, Communication and Instrumentation Branch

Diane L. Duly
Office of the Chief of Staff

Terrence B. Flowers*
Data Systems Branch

Mark E. Kilkenny
Strategic Integration and Project Control

Peter F. Klein*
Space Combustion and Materials Branch

Michael A. Micham
Operations Management Branch

Robert H. Pelaez
Space Combustion and Materials Branch

George W. Readus*
Space Power and Propulsion, Communication and Instrumentation Branch

Donald J. Sawyer*
Contract Analysis Branch

Lynne M. Wiersma
Office of the Director

FORTY-FIVE-YEAR SERVICE AWARD
James A. DiCarlo
Structures and Materials Division

Fred J. Kohl
ISS and Human Health Office

Mack G. Thomas
Community and Media Relations Office

FIFTY-YEAR SERVICE AWARD
John P. Gyekenyesi*
Mechanics and Life Predictions Branch

Albert J. Juhasz
Thermal Energy Conversion Branch

Peter M. Sockol
Combustion Branch


Chornak


Duly


Kilkenny

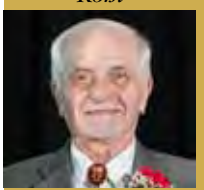

Micham


Pelaez


DiCarlo


Kohl


Thomas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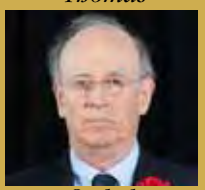
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Wintucky

SERVICE AWARDS

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Edwin G. Wintucky
Electron and Opto-Electronics Branch

SIXTY-YEAR SERVICE AWARD

Earl R. Hanes*
Ceramics Branch

SCIENTIFIC AND PROFESSIONAL (ST) APPOINTMENT

Christopher DellaCorte
Christopher DellaCorte was appointed to the position of Senior Technologist, Tribology and Rotating Machinery, effective November 18, 2012.

INVENTIONS AND CONTRIBUTIONS BOARD (ICB) AWARD

EXCEPTIONAL ICB AWARD

"CT-CURS: Novel Software Method for Computed Tomography Cylinder Data Unwrapping-Reslicing & Analysis, v2"
Peter J. Bonacuse*
Don J. Roth
Richard Martin*
Richard Rauser*

"Fully-Premixed Low-Emissions High-Pressure Multi-fuel Burner"
Quang-Viet Nguyen*

"Polyimide Aerogels"
Mary Ann Meador*
Haiquan N. Guo

"Polymer-Nanoparticle Composites with Improved Processability and Properties"
Sandi G. Miller

Roth

Guo

ICB AWARDS

Miller

FEDERAL ACQUISITION CERTIFICATION FOR PROGRAM AND PROJECT MANAGERS

Federal Acquisition Certification for Program and Project Managers
For satisfaction of NASA-Federal Acquisition Institute requirements for the Senior Expert Level. It grants membership into NASA's Professional Acquisition Community and is recognized throughout the Federal Government.
Renato O. Colantonio*
Ruben Del Rosario
Kathleen E. Schubert*

JSC CENTER DIRECTOR'S COMMENDATION AWARD

Stephanie D. Wilson
For exceptional service as the chief of the International Space Station Integration Branch in the Astronaut Office.

ABE SILVERSTEIN MEDAL

Mark G. Potapczuk
For outstanding contributions that have led to solutions toward increased aviation safety through development and distribution of icing simulation software and research in supercooled large droplet icing physics.

Daniel L. Dietrich
For novel advancements in human pulmonary function measurement and for leadership in droplet combustion and spacecraft fire safety research.

CRAFTSMANSHIP AWARD

Manufacturing Technologies

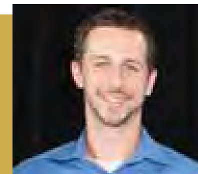
Timothy A. Dunlap
For the ingenious thermocouple solutions developed for the Flow Boiling and Condensation Experiment. The work exemplifies NASA ingenuity and provided critical input into the design.

STEVEN V. SZABO ENGINEERING EXCELLENCE AWARD

Demonstration Using Flattop Fissions Experiment Team
For achievement in demonstrating the feasibility of small space reactor power systems by successfully testing a Uranium-235 fission heat source with Stirling power conversion.

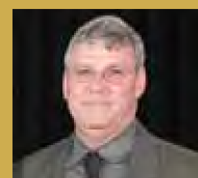
Marc A. Gibson
Maxwell H. Briggs
Lee S. Mason
James L. Sanzi

Gibson



Briggs

Mason



Sanzi

DISTINGUISHED PUBLICATION

Raymond S. Castner*
"Exhaust Nozzle Plume Effects on Sonic Boom."

DIVERSITY LEADERSHIP AWARD

Joseph W. Connolly
For strong leadership and advocacy for inclusion through mentoring and outreach to diverse communities and for encouraging interest and engagement in science, technology, engineering, and mathematics.

GRC SMALL BUSINESS TECHNICAL TEAM OF THE YEAR

For efforts to perform market research and discuss various teaming arrangements to set aside procurement to a service-disabled-veteran-owned small business.

Scott D. Haumesser*
Brian S. Huth*
Erick N. Lupson*
Reinhold (Ron) Mohr*
Teresa L. Monaco
Donald J. Ornick*
Del R. Simonovich
James S. Zakany*

**Photo unavailable.*

GRC SMALL BUSINESS PROCUREMENT PERSON OF THE YEAR

Joan V. Haug*

For diligent efforts in performing extensive market research in order to set aside numerous simplified acquisition procurements for small business.

GRC SMALL BUSINESS SPECIALIST OF THE YEAR

Teresa L. Monaco

For enthusiastic and unending support of and outreach to small businesses, enabling the Center to meet its socioeconomic goals.

GRC SMALL BUSINESS PRIME CONTRACTOR OF THE YEAR

Sunpower, Inc.

For excellent performance, cost, and schedule control in developing the Advanced Stirling Radioisotope Generator Engineering Unit and contributing to NASA's mission objectives.

GRC LARGE BUSINESS PRIME CONTRACTOR OF THE YEAR

Jacobs Technology

For success in actively partnering and subcontracting with small businesses. They meet or exceed their small business subcontracting goals, and the goals are reasonable for the type of work performed.

GRC SMALL BUSINESS SUBCONTRACTOR OF THE YEAR

Tri Models Incorporated

For excellent work in providing mechanical design and fabrication services to comply with aerodynamic and low boom design requirements.

SUPPORT ASSISTANT/CLERICAL AWARD

NASA GLENN RESEARCH CENTER

Dennie W. Gonia

In recognition of exceptional service to the NASA Safety Center.

Brian R. Shefchuk

In recognition of outstanding service to the Chief Engineer Office and the Center.

Ethel L. McLaughlin

In recognition of exceptional performance serving as Executive Support Assistant for the Research and Technology Directorate, and demonstrating outstanding initiative in all assignments.

CENTER 50th AWARDS

SGT, INC.

Patricia A. Michalski

In recognition for commitment to the success of customers, initiative to streamline processes, and the fostering of a team-oriented atmosphere within the Logistics and Technical Information Division.

Ruthann Parise

In recognition of excellent logistics and coordination skills for customers to quickly respond to mishap investigations and audits in support of the NASA Safety Center.

Andrea M. Popiel

In recognition of exceptional administrative support and acquiring subject matter knowledge and computer skills in order to assume additional responsibilities for the Thermal Energy Conversion Branch.

Citations are reproduced from the Honor Awards Program. Graphic Design by Lisa Liuzzo and photos by Marvin Smith and Bridget Caswell.

R&D 100 AWARD

"NASA/Harris Ka-Band Software-Defined Radio"

For outstanding achievement in the research and development of the first fully reprogrammable, space-qualified software-defined radio operating in the Ka-band frequency range.

Jeffery Anderson*
Joseph A. Downey
Sandra K. Johnson
Thomas J. Kacpura
Kevin Moran*
Richard C. Reinhart

"KiloPower"

For outstanding achievement in making deep-space exploration feasible again with KiloPower technology.

David Dixon*
Marc A. Gibson
James Holt*
Lee S. Mason
Patrick McClure*
David Poston*

R&D Magazine annually recognizes researchers involved in the year's 100 most impressive advances. Congratulations to this year's NASA Glenn winners. See page 3 for more in-depth coverage of Glenn's winning technologies.

Pictured left, clockwise: Joseph Downey, Richard Reinhart, Sandra Johnson and Thomas Kacpura. Pictured right: Lee Mason Marc Gibson.

**Photo unavailable.*

Glenn's 2013 Combined Federal Campaign Activities Begin

C-2013-4289 Photos by Bridget Caswell

C-2013-4289

Above: Scott Sanders, Earth Day Coalition, left, presented a community award to Dr. Shyne and Free.

Two Great Causes, One Exciting Event

It was "A time for growing! A time for giving! A time for greening"! when NASA Glenn's 2013 Combined Federal Campaign (CFC) and Green Earth Committee joined forces for one exciting event, Sept. 18. Fresh air and sunshine greeted employees as they gathered on the front lawn of building 3 for the 2013 CFC Block Party and Sustainability Fair. The event showcased CFC-sponsored agencies and environmentally friendly information and products—plus classic cars, food vendors, the NASA Band, free ice cream and socializing among co-workers supporting two great causes. Center Director Jim Free, this year's North Coast CFC chairperson, and Glenn Sustainability Officer Dr. Rickey Shyne, director of the Facilities and Test Directorate, stopped by to share their support.

C-2013-4283

CFC volunteers Janice Gassaway and Mark Kilkenny dished up ice cream at the fair.

C-2013-4600 Photo by Michelle Murphy

CFC Kickoff Inspires Sharing

During the CFC Kickoff, Sept. 19, Glenn employees heard examples of how generosity makes a difference in the lives of fellow Americans. Kate Dunlap, head librarian in Glenn's Science and Engineering Library, LTID (pictured, left) gave a heartfelt testimony about her battle with cancer over the past year. She talked about how a CFC charity helped her and her family through challenging times. Steffani Baker of the Cleveland Alzheimer's Association talked about how her charity can help those impacted by this devastating disease. North Coast CFC Chairperson, Center Director Jim Free, along with Glenn's CFC Chairperson Jackie Barbetta and Co-chair Dawn Pottinger, also provided information about the campaign and upcoming events to encourage employee participation.

See page 14 for upcoming CFC activity dates.

Valuing our Veterans, POW/MIAs

More than 83,000 Americans remain unaccounted for from past wars and conflicts. During Glenn's POW/MIA Ceremony, Sept. 20, Dr. Stephen P. Johnson, a historian in the Department of Defense's (DOD) Prisoners of War/Missing Personnel Office, shared gripping examples of the dedication and coordination of DOD personnel to locate soldiers, recover the remains and return them to their families for burial. Glenn's Veterans Awareness Committee (VAC) annually sponsors this event and others—Memorial Day and Veterans Day observances—to remember the ultimate sacrifice paid by the soldiers and their families. The VAC also coordinates several luncheons throughout the year for veterans to share their experiences and receive appreciation for their service.

Photo by Marvin Smith

Above: Center Director Jim Free greets center vets and guests from the USAF Reserve at Youngstown attending the Aug. 23 luncheon. Left: Dr. Johnson speaking.

ACTS Reaches Anniversary Milestone

Eighty employees and retirees celebrated the 20th launch anniversary of the Advanced Communications Technology Satellite (ACTS), Sept. 12, at the NASA Glenn Picnic Grounds. NASA Glenn, then Lewis Research Center, managed the project.

The ACTS satellite launched in September 1993, and after a two-and-a-half month, on-orbit system checkout, the Experiments program began on Dec. 1, 1993. Experiments were continuously operated for 78 months, as the satellite supported 103 experiments and over 80 demonstrations. On May 31, 2000, the ACTS Experiments Program officially came to a close.

The 103 experiments were proposed by 61 unique principal investigator (PI) organizations. Of those experiments selected during the life of the program, 50 percent were from government organizations, 34 percent from industry and 16 percent from academia. Experiment hours on the spacecraft totaled over 74,000 throughout the whole program.

Pictured, above, left:ACTS Project Manager Dick Gedney and Senior System Engineer Tom Tanger reminisce during the anniversary picnic. Pictured, above, right: ISS and Human Health Office Chief Tom St. Onge, left, visiting with NASA retirees who returned to celebrate the ACTS milestone, former Center Director Larry Ross (center) and Joe Nieberding.

Balloon-based Mission

NASA's first balloon-based mission devoted to the study of a comet, the Balloon Rapid Response for ISON (BRRISON) project, launched from Fort Sumner, New Mexico, Sept. 28. Managed by NASA Glenn, BRRISON was a time-critical balloon mission developed and built in collaboration with the Johns Hopkins University Applied Physics Laboratory (APL) and the Southwest Research Institute (SwRI), just 1 year after discovery of the comet ISON, a rare type of comet making its first appearance in the inner solar system. BRRISON had only 1 day to observe the comet's travels and take measurements of the water and carbon dioxide content that might help unveil how the solar system was formed. Unfortunately, the payload suffered an anomaly following launch that prevented the collection of mission data. Explore the BRRISON website at http://brrison.jhuapl.edu/index.php for more details.

Glenn Supports Feds Feed Families Food Drive

Above: Several Lewis Field personnel posed with donations just before the final pickup. Left: Plum Book personnel took a break in between loading donations for drop off at the local food kitchen.

NASA Glenn joined federal agencies across the nation in the fight against hunger by participating in the 5th Annual Feds Feed Families food drive during the month of August. Lewis Field and Plum Brook Station employees donated a total of 1,628 pounds of food items that were distributed to the Cleveland Food Bank and Victory Kitchen in Sandusky. Food drive coordinators—Andrea Bonesteel (Lewis Field) and Geneva Biglin (Plum Brook)—noted that although the total weight was down from last year, the nutritional value of the food surpassed past donations.

Awards, Honors and Promotions

The Career Communications Group's *Women of Color* magazine will present a Technology Rising Star Award to Dr. Azlin Biaggi-Labiosa during the 18th Annual Woman of Color STEM Conference, Oct. 17–19. Biaggi-Labiosa, a research electronics engineer in Glenn's Sensors and Electronics Branch, is recognized for technical excellence in developing new nano-based materials for chemical sensor applications and her commitment to educational outreach.

Dr. Biaggi-Labiosa

ATC club members applaud Robinson, far right, following club competition.

Alfreda Robinson, CHI/Operations Management, moved on to the Western Division competition, Oct. 26, after winning the Humorous Speech category at the Toastmasters West Area-42 Sectional at Westlake Porter Public Library, Sept. 21. Robinson was one of two Glenn Aerospace Toastmasters Club (ATC) members who won the club's competition and the right to compete in the Sectional. William Marshall, Propulsion and Propellants Branch, won in the Table Topics/Impromptu category. The ATC is an affiliate of Toastmasters International, focused on helping members build skills needed to become effective communicators and strong leaders in the workplace and their communities. For more information on the club, visit http://aerospace.toastmastersclubs.org.

Adam Bihary has been selected project manager lead in the Facilities Division Project Management Branch, Facilities and Test Directorate. Bihary is a registered professional civil engineer, who has been involved in several high-profile projects at Lewis Field and Plum Brook Station, while also serving on selection boards and as a member of the Process Systems Safety Committee.

Bihary

Griffin

Thomas Griffin has been selected mechanical engineering technical lead for the Propulsion Systems Laboratory in the Wind Tunnel and Propulsion Test Branch, Testing Division. Griffin has gained extensive technical knowledge and experience serving NASA Glenn as a test engineer for the past 26 years, including 22 working for the U.S. Army Research Laboratory, Vehicle Technology Directorate.

Mark your calendar!

CFC Events Rescheduled

Now is the time to participate in the 2013 Combined Federal Campaign (CFC) events.

CFC Pacesetter Campaign
Extended through Friday
There is still time to become a CFC Pacesetter! The CFC Pacesetter Campaign has been extended to Nov. 8. You can donate via Employee Express, pledge card or anonymously. Be a leader, donate today!

CFC Chili Cook-Off
November 12
Administration Bldg. Auditorium

CFC Basket Raffle
November 22
Location to be determined

In Appreciation

I want to thank everybody for the good wishes, beautiful gifts, cake, flowers and patriotic banners in celebration of my retirement in May. Jacky and Nancy, you made my day so beautiful! Although I have many projects I am working on in retirement, it will take some time for me to disconnect from NASA—the best place to work. I think of it every day and thank God to have been working there. I miss the mechanical design group and all my friends at NASA.

—Elena Ispas

Welcome to the NASA Family

Glenn was two for two the past two months! Two Pathfinder interns joined the NASA family in August: Dionne Hernández-Lugo, Electrochemistry Branch; and Jeremiah O'Callahan, Procurement Division. In September, two more employees came aboard: Daniel Dessauer, an intern in the Center Operations Directorate, and Jordan Wiker, a full-time civil servant in the Quality Engineering and Assurance Branch.

Hernández-Lugo

O'Callahan

Dessauer and Wiker

A Nation Mourns—Mercury 7 Astronaut Scott Carpenter

Carpenter

M. Scott Carpenter, 88, one of the original seven Mercury astronauts, died Oct. 10, 2013. Carpenter was the only American who served as both an astronaut and an aquanaut.

Carpenter was a U.S. Navy test pilot and veteran of the Korean War, prior to selection as an astronaut in 1959. He was backup pilot to John H. Glenn, the first American to orbit the Earth, Feb. 20, 1962, and became the second American to orbit the Earth, 2 months later on May 24, 1962. After his spaceflights, Carpenter helped design the Apollo Lunar Landing Module and served as liaison with the Navy for underwater (neutral buoyancy) crew training for spacewalks until retirement in 1969.

"His accomplishments truly helped our nation progress in space from the earliest days to the world leadership we enjoy today," said NASA Administrator Charlie Bolden. The official NASA biography on Carpenter is available at http://www.jsc.nasa.gov/Bios/htmlbios/carpenter-ms.html.

Thomas E. Cowell, 66, who retired in 1996 with 16 years of federal service, died Aug. 21. Cowell was a U.S. Air Force veteran of the Vietnam War who joined the NASA workforce as a photographer. He served as a member of the Photolab & Illustrations Team, Technical Information and Services Division. Cowell was also a performing tenor with the Cleveland Orchestra Chorus and the Cleveland Opera Theatre Ensemble.

Eugene "Gene" Krawczonek, who retired from NASA in 1988 with 33 years of federal service, died July 27. Krawczonek joined NASA in 1955 from the Naval Ordinance Department (Calif.) He began working as an operations engineer on installation of the Rocket Engine Test Facility, where he worked the bulk of his career. Krawczonek was a former chief of the Engineering Operations Branch, Chemical Propulsion Division.

S. Stanford Manson, 93, who retired in 1974 with 32 years of NASA service, died July 7. Manson was a metals researcher whose decades-old formulas are still in use to predict metal fatigue on Earth and in space. He transferred from NACA Langley to NACA Lewis in 1943. He wrote several books and helped discover the Manson-Coffin Law and the Manson-Hirschberg Method of Universal Slopes—findings crucial to space engines and heat shields. Manson retired as Materials and Structures Division chief.

Lee Harold Wagner, 94, who retired in 1988 with 31 years of federal service, died Aug. 15. Wagner began his NASA career as an aeronautical engineer working in space propulsion technology on the Saturn 5 launch vehicle for Apollo missions. He earned honors as a member of the Advance Gas Turbine Project team that designed, built and tested the first fuel-efficient, high-temperature turbine engine for automobiles. Wagner was a U.S. Air Force pilot in WWII and active member of the Experimental Aircraft Association.

Cowell

Wagner

Calendar

VETERANS DAY OBSERVANCE: In lieu of the regularly scheduled Veterans Day Program, the Veterans Awareness Committee will honor veterans with a wreath laying ceremony at the flag pole outside of building 3, Thursday, Nov. 7, noon. For further information, please contact Samantha Brinkman, 216-433-6613.

IFPTE LOCAL 28, LESA MEETING: LESA will host its next membership meeting on Wednesday, Nov. 13, noon, Employee Center's Small Dining Room.

NATIVE AMERICAN HERITAGE MONTH OBSERVANCE: Glenn's 2013 Native American Heritage celebration will be Wednesday, Nov. 20, from 1:30 p.m. to 3:30 p.m. in the building 3 Auditorium, featuring a review of the movie, "Reel Injun," and cultural food. POC: Avis Hudson-Burnette, 216-433-6072.

GRC CONNECTIONS FORUM: The next forum is Thursday, Nov. 21, from 10 to 12 p.m. in the Briefing Center. The event is expanded to host a new Business Awareness and Appreciation event that will feature key speakers and interactive activities. Refreshments will be served. POC: Mr. Harvey Schabes, 216-433-5309.

RETIRED WOMEN'S LUNCHEON: The NASA Retired Women's Luncheon will be held Thursday, Nov. 21 at 1 p.m. at Clementine's, 8092 Columbia Rd., Olmsted Falls. Call Gerry Ziemba, 330-273-4850 for reservations.

National Aeronautics and Space Administration

John H. Glenn Research Center at Lewis Field
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December issue copy deadline: Nov. 15, noon

Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

Safety & Health Day Activities Stress "Safety Depends on You"

Glenn personnel from the Safety and Mission Assurance Directorate (SMAD) hosted the center's annual Safety & Health Awareness Day, Sept. 12, featuring speakers, information booths, health walks and a mishap panel to reinforce the message of individual responsibility to ensure a safe and healthy work environment. SMAD Director Anita Liang welcomed employees and shared some of the center's 2013 safety achievements during the kickoff held in the Lewis Field hangar and aired on GlennTV for Plum Brook Station (PBS). The featured presentations by motivational speaker Steve Uzelac, and keynote speaker Wayne Hale, NASA's former Space Shuttle Program Manager, provided poignant examples of our capacity to be heroes by observing basic rules of safety and envisioning potential risks, so we can accomplish our mission and go home at the end of a workday.

By S. Jenise Veris

Photos by Michelle Murphy and Doreen B. Zudell

Clockwise: PBS Deputy Manager Dave Taylor, (far right) joins PBS employees on the Health Walk; Keynote speaker Hale shares his personal reflections on the root cause of the accident that led to loss of Space Shuttle Columbia and the STS-107 crew; Erie County Hazardous Material Team personnel, left, explain equipment and procedures to PBS's Greg Gradisek; and Mishap panelist Keith Peecook, second from right, leads a discussion on the mishandling of asbestos mitigation in a Lewis Field laboratory.

National Aeronautics and Space Administration

AEROSPACE Frontiers

VOLUME 15 ISSUE 11 DECEMBER 2013

Glenn Takes Charge in ISS Battery Replacement

While batteries are necessary for electronics here on Earth, long-lasting, dependable batteries are essential to the operation of the International Space Station. The space station orbits the Earth every 90 minutes, and for about 35 of those minutes while in the Earth's shadow (eclipse), battery power must take over for the solar arrays.

To ensure the space station runs efficiently and effectively through 2028, NASA is developing a lithium-ion battery-based system to replace nickel-hydrogen batteries currently on the station. NASA Glenn is co-leading the Lithium-Ion Battery Project with Johnson Space Flight Center.

"Lithium-ion batteries weigh less, are smaller and offer higher power. Additionally, one lithium-ion battery can replace two nickel-hydrogen batteries," explained Penni Dalton, a member of Glenn's ISS and Human Health Office who serves as Battery Subsystem manager for the space station. "They are also designed for longer operation than

Continued on page 2

C-2013-4865 Photo by Bridget Caswell

Center Earns CMMI Level 2 Flight Software Certification

NASA Glenn's Flight Software Branch recently achieved accreditation on the quality and consistency of its software development processes. In August, branch members participated in a week-long appraisal by the Software Engineering Institute of Carnegie Mellon University to earn Capability Maturity Model Integration (CMMI) organization certification at Maturity Level 2.

As a result of this achievement, customers can expect an organized, repeatable and proven approach to software development, as well as improved product and process quality as a result of this achievement.

"The successful achievement of CMMI Maturity Level 2 verifies that our organization follows best practices for software

Continued on page 2

Left: Flight Software Branch members Phil Gonia, standing, and Joe Ponyik review data on the Spacecraft Fire Safety Demonstration project, which was part of the appraisal.

In This Issue

Silver Snoopy Awards

Astronaut Doug Wheelock recently visited Lewis Field to honor 12 Glenn employees with the prestigious Silver Snoopy Award for their commitment to flight safety and mission success. See page 3 for details.

Gas Cylinder Return Project Results in Substantial Savings

Collaborative Effort Creates Safer Environment

Empty gas cylinders lying dormant can be costly. So NASA Glenn's Logistics and Technical Information Division (LTID) developed a plan to return leased cylinders to local vendors. The plan was not only instrumental in reducing rental costs of approximately $270,000 annually but also in creating a safer work environment, since many of the cylinders were rusted and in poor condition.

Under the Gas Cylinder Reclamation Project, an LTID Logistics team focused on cylinders registered in Glenn's returnable container system. Over a 4½-month period, team members searched buildings, laboratories and shops for registered vendor-owned cylinders, with emphasis on larger vendors that charge higher rental costs. Rental rates range from 20 cents to $1 daily for each cylinder, depending on the type of gas they contained and the size of the cylinder.

"This project was an exciting challenge for our Logistics team," explained Jeanine Hanzel, LTID/TIALS Logistics manager. "Through our hard work we were immediately able to see results that positively impacted the entire NASA Glenn community."

Hanzel said within the first 4 months more than 650 cylinders had been processed and returned, despite obstacles such as locked shops and cages and the fact that most gas cylinders have a 5-inch circumference and weigh 150 pounds. The plan included search and removal at both Lewis Field and Plum Brook Station.

Gary Crawford, ACOTR for the TIALS Logistics Contract, said the project could not have been successful without the collaborative effort of the directorates that rent gas cylinders. Additionally, staff members in finance, procurement, legal, logistics, safety and health were vital to the project's success.

—By Doreen B. Zudell

Thanks to this collaborative effort, LTID was able to return gas cylinders of various sizes and types to vendors, eliminating additional rental costs.

Flight Certification

Continued from page 1

development," explained Lindsey Wilford, the Software Engineering Process Group (SEPG) lead at Glenn. "This ensures that the projects we support receive an increased level of quality in all of our products and processes."

Some of the projects included in the CMMI appraisal were Compatibility Test Sets, Cryogenic Propellant Storage and Transfer and Spacecraft Fire Safety Demonstration Project.

This certification meets an important agency requirement for software engineering, allowing Glenn to develop space-rated software systems (nonhuman) and software for large-scale aeronautics vehicles, among other classes of software.

Space Station Battery Replacement

Continued from page 1

the nickel-hydrogen batteries. Lithium-ion batteries offer a lifetime requirement of over 10 years as opposed to a 6-1/2 year requirement for nickel-hydrogen."

Dalton oversees overall battery development and testing including an engineering model of actual-size battery cells operating continuously at Johnson Space Flight Center in Houston, and the charge and discharge battery activities at the Naval Weapon Support Center in Indiana. Additionally, NASA Glenn technicians are conducting charge and discharge drills on 1/3–scale cells in building 301. The testing that is underway at Johnson, Glenn and the Naval Surface Warfare Center gives the project insight into any issues that arise on-orbit with the change. This allows the project team to make changes prior to building the first flight batteries.

One of the challenges Dalton and the team must overcome is developing batteries that will fit into an electric power system originally designed for nickel-hydrogen cells. "Getting the new batteries to operate in these battery slots without changing any existing on-orbit hardware is very challenging, but we're confident we will meet that goal," Dalton said.

The Critical Design Review for the Lithium-Ion Battery System occurred last month, well in advance of the first scheduled launch on the Japanese HTV (H–II Transfer Vehicle) launch in 2017.

—By Doreen B. Zudell

Ribbon Cutting Ceremony Highlights "Hub of Operations"

NASA Glenn employees and guests gathered for a ribbon cutting ceremony and open house for the new Shipping and Receiving Facility, or SaRF, at Lewis Field, Oct. 30. The 12,700 square-foot building enhances secure handling and expedient distributing of materials and equipment throughout Lewis Field, as well as the inspecting and sorting of incoming mail.

The event included accolades from Glenn's former and current senior leaders involved in the evolution of the SaRF, as well as employees who work in the new facility.

In her opening remarks, Center Operations Director Robyn Gordon said this is the first time Logistics will have its own space, designed for their specific needs, that offers improved efficiency, safety and security.

Transportation Manager Dr. Antoine Moss and Logistics Representative Christopher Mowcomber shared their excitement about working in this state-of-the-art facility that will serve as the "Hub of Operations" for the center.

Mowcomber, who is responsible for processing incoming freight into the new building, outlined several examples of features that ensure the safety and security of employees. Some of those include a video intercom system to announce the arrival of visitors; automatic dock levelers that eliminate the risk of injury associated with previous manual dock levelers; bar restraints to keep vehicles stationary when loading and unloading; and an explosion-proof inspection room.

Additionally, the building earned Leadership in Energy and Environmental Design (LEED) Gold Certification for New Construction from the U.S. Green Building Council.

SaRF became fully operational last month. —By Doreen B. Zudell

C-2013-4745

Above: left to right, SaRF Project Manager, Facilities Test Division/FANS, Jeff Schultz; Center Director Jim Free; Director, Center Operations Robyn Gordon; and Director, Facilities and Test Directorate Dr. Rickey Shyne join in the ribbon cutting. Below: Schultz, Free, Gordon, Brook Park Mayor Mark Elliott, Former Center Director Dr. Woodrow Whitlow Jr., former Associate Director Vernon "Bill" Wessel and Dr. Shyne were key advocates for the SaRF project.

C-2013-4747

Photos by Marvin Smith

Glenn Employees Earn Coveted Silver Snoopy Award

Astronauts' Highest Honor

On Oct. 31, astronaut Doug Wheelock surprised 12 Glenn employees by visiting their worksites to thank them for their commitment to flight safety and mission success. Following the visits, Wheelock presented Silver Snoopy Awards, the astronaut's recognition of excellence, at an awards reception.

Surprisingly, the actions of two award recipients, Robert Bruckner and Richard Manco, impacted a critical situation on the International Space Station during Wheelock's command of Expedition 25. All the honorees received the coveted Silver Snoopy pin, a certificate, and astronauts'' letter of appreciation. They include:

Eric H. Baker, Structures and Materials Division, for outstanding structural analysis and superior technical capability in developing critical technologies to ensure the safety and reliability of spaceflight hardware for future space transportation systems.

Robert Bruckner, Structures and Materials Division, for identifying the root cause of the ISS thermal control pump failure during Expedition 25, which enabled specific operational modifications required to ensure future reliability, safety and performance of the critical ISS thermal control systems.

Dale Dragony, Mechanical and Fluids Systems Division, for outstanding technical support as principal designer for two key Multi-Purpose Crew Vehicle engineering studies: use of the European Space Agency's service module and the propulsion affordability study.

Continued on page 8

Notable Leaders Tell "The Centaur Story"

In recognition of the 50th Anniversary of the first successful launch of the Centaur upper stage rocket, two notable NASA Lewis/Glenn leaders from our center's past, Former Center Director Larry Ross and Joe Nieberding, presented a seminar titled "The Centaur Story" on Oct. 25 at Lewis Field. Centaur served as the workhorse for many of our nation's most ambitious space endeavors, including the legendary Pioneer, Viking and Voyager interplanetary missions. Pictured is Nieberding, standing, and Ross, seated by podium.

C-2013-4640 Photo by Bridget Caswell

C-2013-4659 Photo by Michelle Murphy

Aspiring Astronauts Take Early Training

On Nov. 2, NASA Glenn hosted nearly 350 students (grades 1 through 12) at the 21st annual Young Astronaut Day held in the Lewis Field hangar. Teams of students competed in a variety of engineering and science activities involving Lego robotics, wind tunnel tests, laser communications and more. Astronaut Stephanie D. Wilson, currently serving as chief of Glenn's Program/Project Integration Office, gave the keynote address and interacted with the students. Glenn's Exploration Systems Project Office, the AIAA Northern Ohio Section and the three partnering companies of Glenn's TFOME contract, sponsored this year's event. More than 70 volunteers from across the center participated. Pictured, left, astronaut Wilson advises students on development of their Lego robot for the Asteroid Capture challenge.

Overcoming Life's Challenges

During Glenn's Disability Awareness Month Observance, Oct. 30, Kelly Gilkey, Structural Systems Dynamics Branch, shared her personal story of growing up hearing impaired and overcoming challenges to become a successful bio-medical engineer. Gilkey, who has a congenital, bilateral profound hearing loss, wears a cochlear implant and hearing aid. Dr. Rachel Vovos, of the Cleveland Clinic, right, explained auditory-based therapy and how Gilkey, left, has benefitted from the implant. Patricia Kons, SGT/Procurement Division, who teaches a special needs class at O'Connor Dance Studio, brought some of her students to perform dance selections.

Photo by Richard Woodard

Photo by S. Jenise Veris

Little Feet Trick or Treat

Lewis Littles Folks teachers and more than 100 students at the onsite development center did not let the bad weather rain on their annual Halloween Parade, Oct. 31. Parents and friends brought the treats inside and filled the bags of various young costumed characters as they paraded around the center lobby.

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


Photo by S. Jenise Veris

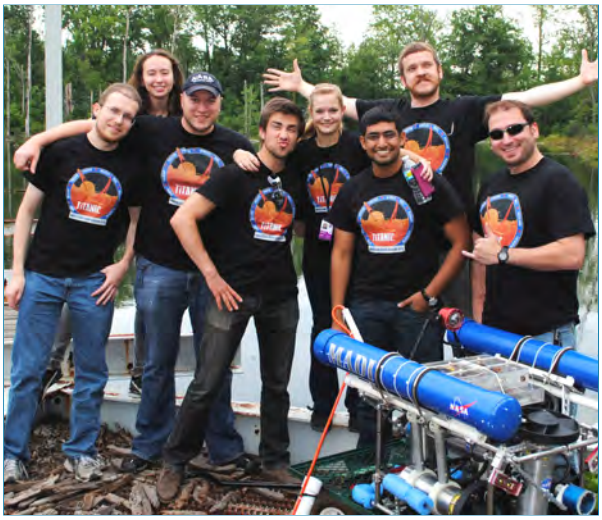
Remembering Our Veterans

Center management and employees supported a simple, but significant, wreath-laying ceremony coordinated by Glenn's Veterans Awareness Committee (VAC) at the Lewis Field flagpole, Nov. 7. Tom Hartline, director of Engineering, urged the crowd to thank veterans for their service and remember those who died in the line of duty. He also encouraged participants to thank those who continue to serve our country, as well as their families. Glenn Deputy Director Greg Robinson and VAC's Jonathan Drexler placed the wreath. Pictured, left to right: Hartline, Deputy Director Robinson and Associate Director Janet Watkins at the ceremony. Mark Hyatt, bearing the U.S. Marine Corps flag, is pictured in the background.

NASA Academies Expose "Future Leaders" to R&T

How do you ensure future leaders are equipped to carry on the NASA mission? You provide opportunities that offer young people hands-on experiences while working with NASA mentors on cutting-edge NASA research and technology.


Photos courtesy of NASA


Above: Members of the Space Academy following a field test for their "Venus Exploration" project aided by Glenn's MARS Aquatic Descent Instrument. Left: Dr. Kankam, far left, with the Aeronautics Academy RAs on a site visit to GE Aviation.

Last summer, NASA Glenn hosted 18 Research Associates (RAs) identified as "likely future leaders" in the nation's space and aeronautics industry, national laboratories and agencies. These talented and highly motivated undergraduate and graduate students participated in NASA Space and Aeronautics Academies, rigorous, 10-week programs designed to immerse students in advanced science and engineering research projects, while exposing them to center operations and real-life issues that affect management decisions on current and future aerospace programs.

"Among other factors, RAs are chosen based on demonstrated interest and/or prior involvement in space or aeronautics research or projects; excellence in academic performance; demonstrated leadership, and propensity for teamwork," Glenn's Academies Director Dr. Mark "David" Kankam explained.

Unlike most 9 to 5 summer research internships, the Academies' curriculum is fully engaging, including weekends. RAs live at one location to encourage bonding and facilitate teamwork on a selected combined Academies group project and individual team research projects proposed by Glenn mentors.

An alumnus of the NASA Academy Alumni Association serves as staff and aids in the curriculum design that includes evening lectures at the residence, and daytime onsite visits to NASA industry partners and collaborators to tour facilities and engage in technical exchange. Space X, Rolls Royce and GE Aviation were among this year's group of site visits. Similarly to other NASA Higher Education programs, the Academies conclude with final poster presentations where RAs report outcomes of their research projects to the Center community, and a graduation ceremony.

Examples of Glenn's 2013 NASA Academy complex projects include "All Electric Regional Transport Aircraft with Advanced Electric Motors, Power Management and Distribution, and Energy Storage" and "Real-time, Multi-modality, Multiple Cognitive State Monitoring to Improve Aviation Safety." NASA's Aeronautics Research Mission Directorate (ARMD) and the Center's

Continued on page 7

Awards, Honors & Promotions

NASA Glenn's Kim de Groh, Space Environment & Experiments Branch, received the National Aeronautic Association's (NAA) prestigious Katharine Wright Trophy, Nov. 12, at the NAA Fall Awards Banquet. She was honored for her tireless efforts in mentoring young women for over two decades and for numerous technical achievements in the advancement of materials durability in the space environment.

The trophy, named in honor of Orville and Wilbur Wright's sister, Katharine, reflects how crucial her support was to her brothers' development of the first airplane, while highlighting a recipient's contributions to the success of others or a personal contribution to the advancement of aviation and space flight over an extended period of time.

de Groh, far right, accepts the trophy from NAA Board Member Pat Prentiss.

Dr. Barrett

Button

Dr. Reddy

Udom

DeGreen

Laverne

Dr. Michael J. Barrett has been selected deputy chief of the Space Technology Project Office, Space Flight Systems Directorate. He is responsible for projects performed in the Game Changing Development Program, Technology Demonstration Mission Program and Small Satellite Technology Program areas. Barrett previously supported the Asteroid Redirect Robotic Mission as the Solar Electric Propulsion Module manager assigned to the Chief Engineer's Office.

Robert Button, Energy Systems Branch, received the NASA Engineering and Safety Center (NESC) Leadership Award during the NESC Honor Awards Ceremony in October. Button is recognized for his outstanding technical leadership of the Extravehicular Mobility Unit Lithium Ion Battery Assessment. The NESC Leadership Award honors individuals who have had a pronounced effect upon the technical activities of a team of experts from NASA, industry, other government agencies and academia, leveraging their expertise to solve problems.

The American Society of Mechanical Engineers (ASME) elected **Dr. Dhanireddy "D.R." Reddy**, chief, Glenn's Aeropropulsion Division, to the rank of Fellow. Reddy is lauded for his vision, motivation and outstanding reputation in research and technology for more than 25 years of leadership, as well as his personal contributions as a researcher to advancements in aerospace propulsion technology and computational fluid dynamics relative to aerospace propulsion systems.

Innocent Udom, University of South Florida graduate student in the NASA Harriett G. Jenkins Pre-Doctoral Fellowship Program (JPFP), won the student poster competition at the 64th International Astronomical Congress, Beijing, China, in September. His poster titled, "Photocatalytic Application of Zinc Oxide Nanowires for Green Space Exploration," was based on study while working as a JPFP fellow in NASA Glenn's Bioscience and Technology Branch. Udom's mentor was Dr. Al Hepp.

John DeGreen has been selected as the civil systems manager in the Facilities Division. DeGreen is a registered professional engineer and LEED AP (Leadership in Energy and Environmental Design Accredited Professional), who has served as the civil engineer on many design and construction projects at Lewis Field and Plum Brook Station.

Carol Laverne has been selected as the Information Protection Program manager in the Risk Management and Security Office, Office of the Chief Information Officer. Laverne joins the organization from the Planning and Integration Office, Facilities and Test Division, where she previously served as the Maximo Systems Administrator and IT Relationship manager.

Retirements

James Fleet, Space Power & Propulsion, Communication and Instrumentation Branch, Facilities and Test Directorate, retired Nov. 30, 2013, with 33 years of federal service, including 30 with NASA.

Gloria Richards, Management Support and Integration Office, Research and Technology Directorate, retired Nov. 29, 2013, with 39 years of NASA service.

Fleet

Richards

NASA Academies

Continued from page 5

Aeronautics Research Office vet all proposed Aeronautics Academy research projects prior to posting for prospective applicants.

This year marks the 20th anniversary of the first NASA Academy, a NASA Space Academy, founded by Gerald Soffen, the first Director of the NASA Goddard Office of University Programs. The NASA Aeronautics Academy was implemented for the first time in the summer of 2010, with Glenn as the lead center.

The National Space Grant Consortia and NASA's ARMD and Space Technology Mission Directorates sponsor the NASA Academies, which also include the Propulsion and Robotic Academies. Eligible students interested in the NASA Academies can apply now through NASA's One Stop Shopping Initiative (OSSI). See the Fellowships section for more details.

—By S. Jenise Veris

Exchange Holiday Sale

Now-Dec. 31

Come to the Exchange Store in Building 15 for great NASA and NASA Glenn gifts for family and friends. Save 20% off clothing, toys, calendars, Fisher space pens, glassware, lunch bags, gear bags, backpacks, golf balls and towels, Christmas ornaments, and much more. Save 10% off framed pin sets, freeze-dried ice cream, children's watches, and the new plush, Hello Kitty® Astronaut. Store hours are 9:30 a.m. to 3:00 p.m. VISA, MasterCard, Discover, American Express, Cash and Checks accepted.

More than a Memory

Cubbison

Fuller

Giordano

Reiber

Wakeman

Robert W. Cubbison, 85, who retired with more than 40 years of federal service, died Sept. 23. A veteran of the U.S. Air Force, Cubbison began his NACA/NASA career in 1952 as a summer intern. After graduating Case Institute of Technology, he returned to work in the Inlet Technology Section of the Advanced Systems Division. Cubbison was an expert in fuel ramjet engine research and testing conducted in Glenn's 10- by 10-Foot Supersonic Wind Tunnel.

Harry Fuller III, 63, who retired in 2011 with 24 years of federal service, died Nov 11. Fuller was a Vietnam veteran, who began his NASA career in 1990. He graduated from the Apprentice program in 1995 as an electronic systems mechanic. Fuller worked primarily in the Engine Research Building, where he was the lead electronics technician for the build and delivery of the WC-B Single-Spool Turbine Rig. He retired from the Aviation Environments Technical Branch.

Salvatore M. Giordano Sr., 78, who retired in 1997 with over 30 years of federal service, died Sept. 25. Giordano, who was a veteran of the U.S. Army, served his entire NACA/NASA career as a research mechanic in the Test Installations Division.

George A. Reiber, 96, who retired in 1974 with 27 years of federal service, died May 29. Reiber was a U.S. Army veteran of World War II who began his NACA/NASA career as a member of the 1955 Apprentice class. He was a metalsmith who crafted the exterior metal covering for many of the space program's rockets. Reiber was a member of the Lewis Servicemen's Club, which performed numerous community outreach projects.

Joel E. Wakeman Sr., 75, who retired from NASA, died Sept. 27. Wakeman was a data analyst who worked at several centers during his NASA career. He transferred from Johnson Space Center in 1977 to head NASA Lewis' (Glenn's) Applications Programming Section, Computer Services Division. In 1983, he transferred to NASA Stennis Space Center, where he retired in his native Mississippi.

NASA Impact: "Glennovation" Feature Touts Glenn's Contributions to Society

Want to know more how NASA Glenn benefits you and your community? The Office of Technology Partnerships and Planning has developed a new feature that illustrates 98 technologies, developed or improved by NASA Glenn staff, that have made a significant, positive and clear difference to society. Visit http://www.nasa.gov/centers/glenn/home/index.html to learn more!

In Appreciation

I want to express my gratitude to the GRC family for their support during my recent illness and recovery. The cards, hugs, kind words and sometimes unexpected acts of kindness were humbling and reminded me again why GRC is such a special place to work. Thank you so very much.

—Eric Patton

National Aeronautics and Space Administration

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Editor: **Doreen B. Zudell**, SGT, Inc.
Assistant Editor: **S. Jenise Veris**, SGT, Inc.
Managing Editor: **Kelly R. DiFrancesco**

Silver Snoopy Awards

Continued from page 3

Timothy Dunlap, Manufacturing Division, for developing a method to hermetically seal sample tubes, eliminating the possibility of compromised science due to diminished fluid levels, that substantially improved the quality, performance and reliability of the In SPACE-3 experiment program.

Alan Linne, Chief Engineer Office, for leadership in developing and implementing the first integrated, multi-project Systems Engineering Management Plan, which has resulted in a more streamlined, effective process for meeting technical requirements for all ISS experiments and human research projects.

Richard Manco, Testing Division, for significant contributions to ensure flight safety and mission success of the ISS through the design, build and operation of a flow visualization test rig that produced data critical to validating the root cause failure mechanism of the ISS thermal control system pump during Expedition 25.

Alexandra Mills, ISS and Human Health Office, for dedication and hard work in establishing office level processes to streamline reporting critical information to management internal/external to the center, resulting in a more productive environment.

C-2013-4815 Photo by Bridget Caswell

Left to right, staggered: Sowers, Dunlap, Baker, Wernet, Bruckner, Linne, Deputy Dir. Robinson, astronaut Wheelock, Associate Dir. Watkins, Manco, Mills, Dragony, Scina, Zernic and Nguyen.

Xuan Nguyen, ISS Research and Human Health Office, for providing mission planning, manifesting and integration activities for Glenn's ISS Physical Sciences Research Investigations deployed to ISS over the past 12 years.

Ruth Scina, Space Operations Project Office, for sustained outstanding project management support to Glenn's Space Communications Office projects and NASA's Space Communications and Navigation program.

Thomas S. Sowers, Communications, Instrumentation and Controls Division, for developing critical liquid rocket-engine health-management technologies focused on improving the safety of future manned spacecraft, including the Systematic Sensor Selection Strategy (S4) to improve engine diagnostic capabilities and post-flight maintenance, and complex Monte Carlo-based engine simulation tools to quantify the effectiveness of a failure detection system for the J-2X engine.

Dr. Mark Wernet, Communications, Instrumentation and Controls Division, for his expertise in developing nonintrusive diagnostics for understanding the intricacies of complex fluid flows aiding the expansion of critical research payloads for the Human Spaceflight Program and successful utilization of the ISS.

Michael Zernic, Space Operations Project Office, for sustained public service and project leadership contributing to the development of a number of areas critical to human space flight, including the ISS's power system, communications technology and network services planning and operations.

—By S. Jenise Veris