National Aeronautics and Space Administration

AEROSPACE Frontiers

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NASA Administrators Visit, Address Employees

Bolden Forecasts Bright Future

During NASA Administrator Charles Bolden's visit to Glenn, Jan. 17, his message was clear: the nation recognizes NASA employees' hard work and has confidence in the agency's plans for the future.

"You are what is most important to this agency," Bolden said to employees at his All Hands Meeting. Following the employee meeting, his full day also included tours and a media briefing at Lewis Field. He stressed that NASA is an organization where people are the most valuable resource and driving force behind the technology.

Continued on page 2

C-2014-273 Photo by Bridget Caswell

Bolden (at podium) addresses media in front of the Electric Power Laboratory's space environment simulation chamber while, left to right, Rep. Kaptur, Sen. Brown and Free look on.

C-2014-287 Photo by Marvin Smith

Ensuring NASA has the "Right Stuff"

NASA Associate Administrator Robert Lightfoot, right, and Deputy Associate Administrator Lesa Roe recently visited Lewis Field to address employees and discuss the agency's processes and initiatives. They lead a team that is assessing the agency's technical capabilities and working to establish a more efficient operating model that will meet current and future mission needs.

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NASA Achieves 10 Years of Roving on Mars

Ten years ago, January 2004, the Mars Exploration Rovers (MER), Spirit and Opportunity, captured the world's imagination when they landed on Mars. The twin robots immediately went to work exploring and sending back data to a team of scientists and engineers, which plots activities for each day of the mission. While MER's mission was only expected to last 90 days, it has continued as Opportunity keeps going, and going and going.

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NASA Administrator Visits

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Bolden proudly cited NASA's ranking as "The Best Place to Work" among (large) federal agencies for the second year in a row. He said the employee survey showed NASA employees like their jobs and value their contributions to the nation.

The $17.646 billion funding bill, passed Jan. 14, he said, recognizes the agency's technological contributions as well as its efforts to reduce costs and streamline activities.

"People believe in us on the Hill," Bolden stated. He said the bill reaffirms support for the bipartisan space exploration plan agreed to by the President and Congress, and will allow NASA to execute research for new aviation and space technologies.

During his presentation and the Q & A period with employees, Bolden stressed the need for energetic and innovative technology.

"This is not a time to rest on our laurels," he said. "We need something that is game-changing."

After the All Hands, Center Director Jim Free escorted Bolden on facility tours highlighting Glenn research and development in Cryogenic Propellant Storage and Transfer, Integrated Radio and Optical Communications, High Ice Water Content Flight Campaign and Solar Electric Propulsion. Between stops Bolden joined early career hires for an informal lunch and discussion.

Ohio's U.S. Sen. Sherrod Brown and House Rep. Marcia Kaptur (9th District) joined Bolden and Free on the last two tours. Soon after, they joined local media who gathered at the Electric Power Laboratory (Tank 5) space environment simulation chamber for a briefing and Q & A session. The chamber is being enhanced for future testing of solar electric propulsion technologies, including those supporting NASA's proposed asteroid mission.

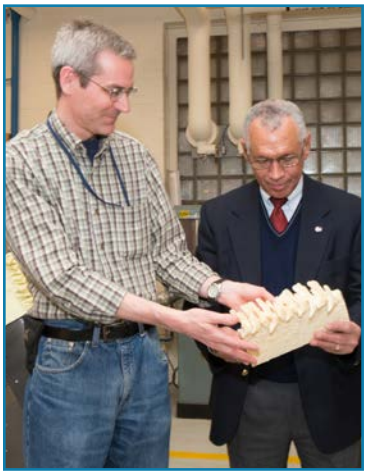
"NASA's path to capturing and exploring an asteroid runs through Glenn Research Center," Bolden said. "The work going on here at Glenn is an essential part of NASA's Asteroid Redirect Mission, and by investing in this technology, NASA is addressing risks that the nation's aerospace industry cannot. This is a great example of a win-win for both NASA and the nation's technical capability."

Sen. Brown and Rep. Kaptur mirrored Bolden's enthusiasm about NASA, and specifically Glenn, as they addressed the media.

"Glenn Research Center is an important reason why NASA is a global leader in advanced technology," Brown said. "Ohio has a proud history of innovation and NASA Glenn's asteroid and de-icing work continue that tradition. Not only does this research and technology make the world safer, it advances what mankind is capable of achieving."

Kaptur affirmed: "If you want to see the new world, come to Cleveland, come to Brook Park, come to this NASA facility."

—By Doreen B. Zudell



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Photos by Bridget Caswell

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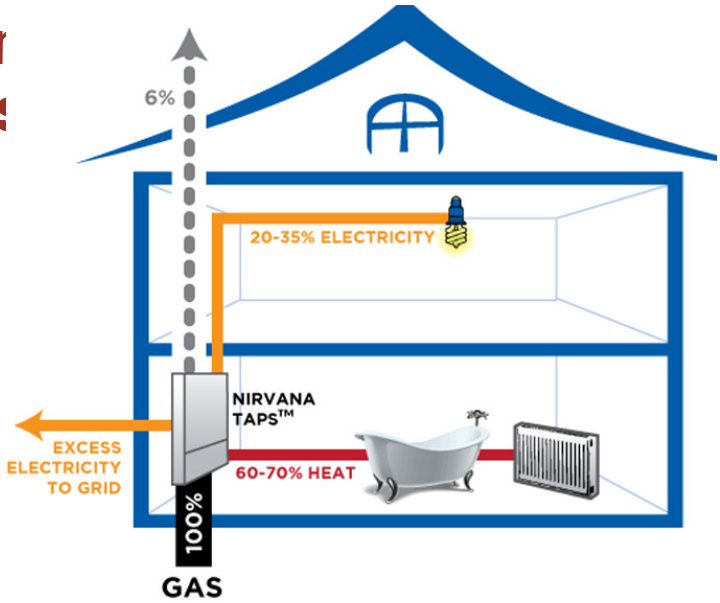
Pictured clockwise: Andy Broeren, Aeropropulsion Division, holds a polyurethane casting of an ice shape generated in the Icing Research Tunnel. • Free joins Bolden on stage for the All Hands Meeting. • Dr. Daniel Raible, Communications, Instrumentation and Controls Division, presents the Integrated Radio and Optical Communications prototype Teletenna. • Bolden joins early career hires for lunch.

C-2014-246

Glenn Technology May Soon Power American Households



NASA licensed technology for use in a new energy device called the Thermo Acoustic Power Stick, or TAPS, may soon provide homeowners a cheaper, cleaner and more efficient alternative to generating power and in heat in their homes.

TAPS was recently unveiled by a local energy startup company, Nirvana Energy Systems, Inc., headquartered in Portola Valley, Calif. TAPS is designed to convert a home's natural gas supply into electricity, providing the home with its own miniature power plant, or micro-grid. Excess heat can be utilized for hot water or augmenting home heating. The device was initially developed with PARC, a Xerox company in Palo Alto, Calif.

At the heart of TAPS is Glenn's acoustic-based Stirling technology adapted from Stirling power technology being developed for spaceflight missions. The acoustic waves eliminate moving parts with the hope of reducing cost and improving the reliability of the thermal-to-electric conversion process. The concept was conceived while studying a combined power and cooling system called Stirling duplex, for a robotic Venus lander mission.

Dr. Rodger Dyson and Geoff Bruder, from the Thermal Energy Conversion Branch, invented the acoustics-based technology. They, along with Frank Ritzert from the Materials Division, are assisting Nirvana to integrate the technology into TAPS.

According to Nirvana, TAPS produces between 1 to 4 kilowatts of electrical power and 15 to 30 kilowatts of thermal power with heating efficiency in excess of 90 percent. The goal is to make TAPS a very compact system that can easily be retrofitted into residential systems.

For more information on licensing Glenn's technologies, visit https://technology.grc.nasa.gov/index.shtm.

—By Frank Jennings Jr.

Mars Rover Anniversary

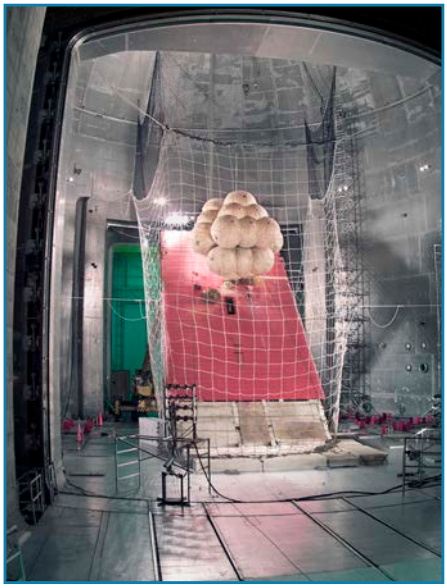
Continued from page 1

NASA Glenn commemorated the MER anniversary, Jan. 11, during "Space Saturday" at Glenn's Visitor Center in the Great Lakes Science Center. More than 1,000 guests viewed the MER model display and participated in the festivities. The featured speaker was Glenn physicist Dr. Geoffrey Landis, a member of NASA's MER science team.

Landis helped analyze the performance of the rover's solar panels in the dusty Martian environment, and continues to monitor Martian dust and its effect on Opportunity's power-generating solar cells. He was part of a team of researchers at NASA Glenn (Lewis), who designed and built three experiments for Sojourner, the first Mars rover from the Mars Pathfinder mission (1997), which paved the way for future robotic surface exploration systems. When Spirit and Opportunity launched in 2003, they used the same airbag landing system that the Mars Pathfinder demonstrated in 1997. Both were tested in Plum Brook Station's Space Power Facility (SPF). A set of the airbags is on display at the Visitor Center.

Opportunity's twin, Spirit, which worked for 6 years, and their successor, Curiosity, have provided valuable information about the diverse watery environments of ancient Mars, from hot springs to flowing streams. In the meantime, the Opportunity team continues to move towards new discoveries that lie ahead, and a better understanding of Mars that will help advance plans for human missions to the planet in the 2030s.

—Edited by S. Jenise Veris



C-2014-662 Photo by Christopher Lynch

Photo by Dante Centuori

Pictured, far left: Airbag testing at Plum Brook inside the SPF. Center: Dr. Landis discusses the MER missions at the GLSC.

NASA Relocates Test Chamber

The Cryogenic Propellant Tank Facility's (K-Site) 30-foot-diameter space environment test chamber—weighing over 100,000 pounds—was recently removed from K-Site (set for demolition in 2014) and relocated over 2.5 miles away at its new location near the Spacecraft Propulsion Research Facility (B–2), Dec. 23. The project included the removal and transportation of the test chamber along with designing and building a new foundation for the pressure vessel. The first planned use of the chamber is to support fuel cell testing, later this year.

Glenn Launches Instagram Account

NASA Glenn is now on Instagram, an online photo and video sharing social media platform. With over 150 million active users, Glenn now shares images and information about the center's research, missions, history and current events with the public.

http://instagram.com/nasaglenn

Photo by S. Jenise Veris

Glenn Experts Say "Ask Me Anything"

Glenn conducted its first Reddit "Ask Me Anything" (AMA) chat, Jan. 13, inviting people from around the world to interact with Glenn electrical propulsion experts. Dan Herman (background) with, left to right, Dave Manzella, Rohit Shastry and Scott Benson responded to queries about Glenn's work in ion propulsion and how it provides fuel-efficient propulsion through space. Reddit is a popular social media platform where registered users ask whatever they want or simply view the questions, and vote them up or down to ensure the most popular questions get answered. Glenn's Web Content Creator Nancy Kilkenny, SGT/Community and Media Relations Office (foreground), moderated the session. The Glenn experts fielded more than 2000 questions and comments in a 2-hour session.

Photo by Kim A. Veris

Lunch Briefings Begin at Statehouse

NASA Glenn held its first Lunch and Learn Briefing at the Statehouse in Columbus, Jan. 8, to inform members of the Ohio General Assembly about Glenn's role in the agency and the center's value to Ohio and the nation at large. Center Director Jim Free (pictured) delivered opening remarks to 55 attendees, including members of the General Assembly, legislative aides and representatives from the Ohio-based aerospace industry. He emphasized the NASA's importance to the state and the nation, before introducing David Manzella, Space Propulsion Branch, who discussed Glenn's solar electric propulsion development.

Comings and Goings

NASA Glenn welcomes and bids farewell to those who joined and left the Director's Strategic Management Team over the past few months:

Joel Kearns was named Deputy Director of the Space Flight Systems Directorate, Dec. 30, 2013. Kearns previously worked at NASA Headquarters as well as NASA's Marshall and Ames centers. His most recent position was Vice President and Director of Solar Wafer Research and Development at SunEdison (formerly MEMC Electronic Materials), St. Peters, Mo.

William R. "Randy" Humphries Jr., who served as Chief Information Officer, retired Nov. 30, 2013, with 26 years of federal service. **Dr. Jih-Fen Lei**, who served as Director of Research and Technology, left the agency, Jan. 11, 2014, with 18-1/2 years of NASA service. **Renee Batts**, who served as Director of Diversity and Equal Opportunity, retired Jan. 3, 2014, with 35 years of NASA service.

Kearns

Humphries

Dr. Lei

Batts

C-2014-422 Photo by Bridget Caswell

Astronaut Wilson Inspires Local Students

Astronaut Stephanie Wilson, detailed to NASA Glenn, inspired more than 1100 Greater Cleveland students to "dream big" during visits to the Joseph M. Gallagher, Cleveland, (pictured) and Shaker Heights middle schools and Bedford High School, Jan. 22 and 23. Wilson, a veteran of three spaceflights to the International Space Station, shared video highlights of the missions. Following each presentation, Wilson answered a variety of questions about her mission responsibilities, educational background and NASA career opportunities. She also distributed her autographed NASA biographical lithographs.

Glenn Experiment Arrives at Space Station

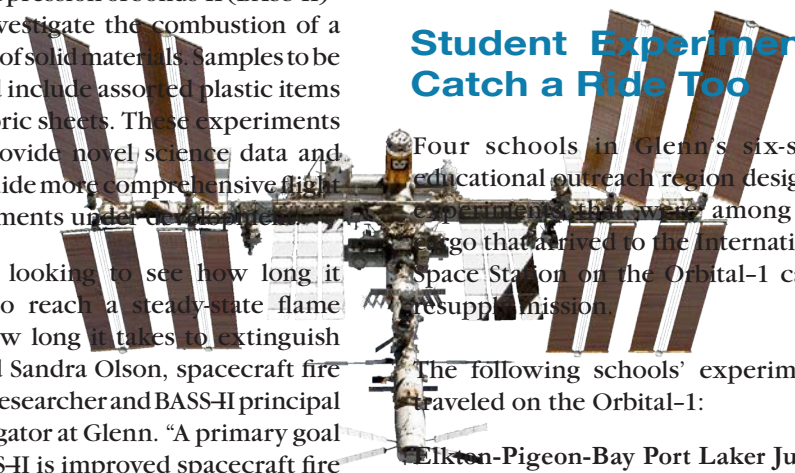
When the Orbital-1 cargo resupply mission arrived at the International Space Station, Jan. 12, an experiment designed by NASA's Glenn was among the cargo onboard.

The experiment entitled "Burning and Suppression of Solids-II (BASS-II)" will investigate the combustion of a variety of solid materials. Samples to be burned include assorted plastic items and fabric sheets. These experiments will provide novel science data and help guide more comprehensive flight experiments under development.

"We're looking to see how long it takes to reach a steady-state flame and how long it takes to extinguish it," said Sandra Olson, spacecraft fire safety researcher and BASS-II principal investigator at Glenn. "A primary goal of BASS-II is improved spacecraft fire safety, improved understanding of combustion in space and how to avoid it. If you're on a mission far from Earth, a fire can be catastrophic. We want to select the safest materials."

Orbital-1 is NASA's first contracted resupply mission to the space station by U.S. company Orbital Sciences Corp. of Dulles, Va. Orbital's Cygnus spacecraft launched atop the company's Antares rocket from NASA's Wallops Flight Facility in Virginia, Jan. 9.

Orbital developed its Antares and Cygnus with NASA support and successfully completed a test mission to the space station in September, enabling the first of eight planned contract resupply flights by the company.



Student Experiments Catch a Ride Too

Four schools in Glenn's six-state educational outreach region designed experiments that were among the cargo that arrived to the International Space Station on the Orbital-1 cargo resupply mission.

The following schools' experiments traveled on the Orbital-1:

Elkton-Pigeon-Bay Port Laker Junior High School, Huron County, Mich.: "The Effect of Microgravity on Calcium Absorption by Bones" • **Macomb Mathematics Science Technology Center**, Warren, Mich.: "The Formation of Silver Crystals in Microgravity" • **Traverse City West Senior High School**, Traverse City, Mich.: "Antibiotic Efficiency in a Microgravity Environment" • **Avicenna Academy**, Crown Point, Ind.: "The Effect of Microgravity on the Development of the Spotted Salamander."

Hensley

Martzaklis

Employee Update

Sammy Hensley, a personnel security specialist assigned to the Protective Services Office, is the newest addition to the NASA Glenn family. Hensley was sworn in Jan. 27.

Konstantinos "Gus" Martzaklis has been named Chief, Program and Project Assurance Division in the Safety and Mission Assurance Directorate (SMA). Martzaklis has amassed extensive management and organizational experience having served previously as SMA Associate Director, last year, and as Acting SMA Deputy Director for 9 months in 2012.

Glenn's First Product Engineering Track Class Graduates

Twelve Glenn employees recently graduated NASA Glenn's first Product Engineering Track (PET) program, a subcomponent of the Space Mission Excellence Program (SMEP). Building on the success of the inaugural SMEP class in 2010, Marton Forkosh, SMEP program manager, designed the PET to fill a shortage of product engineers. They are responsible for the technical management and team leadership of a system or subsystem end item deliverable. Participants were identified by their supervisors as highly motivated individuals with leadership potential. To achieve certification, all participated in an intensive 18-month program that included course work, developmental assignments and details, presentations from outside experts, technical coaching, mentoring and knowledge sharing workgroups.

Pictured are the PET graduates and advocates following the graduation ceremony, Jan. 14, at the Guerin Management Center. Front row, left to right: Alan Kane, Daniel Catalano, Monica Guzik, Vicente Suarez, Robert Tornabene, Dragos Dinca and Human Resource specialist Rochelle Gallagher (SGT). Back row, left to right: Chief of the Mechanical and Fluid Systems Division Derrick Cheston, Clint Ensworth, Frank Quinn, Tony Nerone, Thomas Krivanek, Martin Bradish, Marton Forkosh and Director of Engineering Tom Hartline. Tyler Hickman is not pictured.

Center Earns FLC Award For Technology Transfer

NASA Glenn's commitment to provide companies with technical assistance with the Adopt-A-City program has not only had an economic impact on Northeast Ohio, but has also garnered a national award. NASA Glenn was chosen the recipient of the Federal Laboratory Consortium (FLC) for Technology Transfer's 2014 State and Local Economic Development Award. This award, one of the FLC's highest honors, recognizes successful initiatives that involve partnership between state or local economic development groups and federal laboratories for economic benefit. Glenn's Adopt-A-City Program Manager Carol Tolbert and Technology Integration Manager Dr. Paul Bartolotta will accept the award on behalf of Glenn at the 2014 FLC awards program in April.

Dr. Bartolotta

Tolbert

AIAA Associate Fellows Selected

Five Glenn engineers are among those selected to the American Institute of Aeronautics and Astronautics (AIAA) Associate Fellows class of 2014. AIAA President and former NASA Administrator Mike Griffin recognized the new Associate Fellows during an awards dinner at the AIAA SciTech Forum in Maryland, Jan. 13. Glenn honorees included, seated, left to right, Dr. Amy Fagan, Optical Instrumentation and NDE Branch; Dr. Daniel Herman, Space Propulsion Branch; and Dr. Brenda Henderson, Flight Vehicle Acoustics Branch. Standing, left to right, is Dr. George Schmidt, Research and Technology Directorate, and Dr. Ruben Del Rosario, Aeronautics Research Office. Nomination to the rank of Associate Fellow requires being an AIAA Senior Member for at least 1 year prior to nomination, 12 years of professional experience with notable achievement, and a minimum of 3 recommendations from current Associate Fellows.

Photo by S. Jenise Veris

More Than a Memory

Veleba

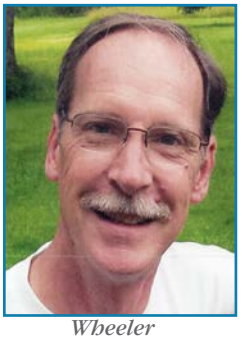
Veleba: A Pleasant Addition to Any Team

Laurel A. Veleba, 49, a program support assistant in the Center Operations Support Branch, Mission Support and Integration Division (MSID), died Jan. 16.

Veleba joined the NASA workforce 29 years ago from the Navy Finance Center. She provided administrative support to several organizations, but many recall her smiling face while supporting the Training Office team for 8 years under supervisor Tom Spicer, now deputy chief, Office of Human Capital Management.

More recently, Veleba served as a member of the MSID Travel Team. "Laurie was a pleasure to have on the team," said MSID Chief Robert Piccus. "Her dedication and camaraderie will be truly missed."

Veleba's father, Don Veleba, a NASA retiree who served as a construction manager, preceded her in death, July 2012.


Wheeler

Wheeler Gave Expert Service With a Smile

Peter M. Wheeler, 59, an information technology specialist in the Risk Management and IT Security Office, died Jan. 17. Commonly known as a "computer guru," Wheeler generously gave of his time and expertise, and always with a smile.

Wheeler, a U.S. Navy veteran who began his NASA career in 1980 working in the Facilities Operations Division, supported a variety of research programs before moving to the Computer Science Division (CSD) in 1996. His tenure in the CSD allowed him to demonstrate his ingenuity and flourish in an area that he truly enjoyed. He earned a Suggestion Award in 2007, which led to the critical development of automated computer disk defragmentation on desktop computers.

"Recently, Pete led the implementation of Glenn Smart Cards, a high visibility effort that required a tight deadline. Pete tackled it with time to spare and that confident smile on his face," said Gib Winter, chief of the Risk Management and IT Security Office. "Pete was not only a valuable member of our team, but also a great person to be around. He will be truly missed."

Earl C. Boitel Jr., 79, who retired in 1993 with 25 years of NASA service, died Jan. 5. Boitel began his NASA career in 1962 working in the Plum Brook Station Reactor Facility until it shut down in 1973. He was featured in the "Ashes and Atoms" documentary about the reactor. He worked in industry before returning to NASA in 1980 and later retired as chief of construction, Facilities and Engineering Division. Boitel performed with a group of colleagues in a band called the Mach 4's. He was a 33-year Army reservist who earned the rank of colonel.

Boitel

Walter M. Krawczonek, 86, who retired in 1990 with 34 years of federal service, died Oct. 27, 2013. Krawczonek, a U.S. Navy veteran of World War II and the Korean conflict, served NASA as a research engineer in the area of power and propulsion. He and three other Krawczonek brothers—Eugene, Edward and John—worked at NASA Lewis in the 1960s. He retired from the Space Systems Technology Office and Power Technology Division and later returned as a support service contractor on the Autonomous Power System Team for several years.

Krawczonek

Calendar

IFPTE LOCAL 28, LESA MEETING: LESA will host its next membership meeting on Wednesday, March 12, noon, Employee Center's Small Dining Room.

ASTRONAUT TALK AND BOOK-SIGNING: Astronaut Donald Thomas, talk and booksigning for his new book, "Orbit of Discovery—The All-Ohio Space Shuttle Mission," will be Thursday, Feb. 20, at 1 p.m. in the Ad Building Auditorium. The book is now on sale in the Exchange Store. Thomas will also appear at the NASA Glenn Visitor Center at the Great Lakes Science Center, Saturday, Feb. 22. Admission that day is free.

On Feb. 20, 1962 John Glenn became the first American to orbit Earth.

GIRLS TAKE FLIGHT EVENT: Volunteers are needed to staff hands-on STEM activity stations and assist Girl Scouts in grades 2 to 5 for this year's "Girls Take Flight" event, to be held Saturday, March 29, from 10 a.m. to 5 p.m. in the Adelbert Gym at Case Western Reserve University. For more information, contact, Dennis Stocker at 3-2166 or dennis.p.stocker@nasa.gov.

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

Retirements

Philip M. Kall, Facilities Division, retired Jan. 3, 2014, with 36 ½ years of federal service.

Kall

Calvin Ramos, deputy chief, Communications, Instrumentation and Controls Division, retired Jan. 11, 2014, with 35 years of federal service.

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Robot Designed for Missions on Earth and in Space

MARS Team's MADI Meets Mission Demands

Diving in unfamiliar bodies of water is always dangerous and many first responder divers get injured every year providing emergency assistance for boating accidents, flood devastation or crime scene searches for evidence.

Working under an existing Space Act Agreement with the City of Cleveland, NASA Glenn's Mobile and Remote Sensing (MARS) Laboratory team has been designing robots that can reduce the risks for these underwater Cleveland police missions, as well as potential planetary applications in methane lakes.

The MARS team, including team lead Mike Krasowski, Larry Greer and Danny Spina, is currently working on the instrumentation of MADI (Mars Lab Aquatic Descent Instrument), an underwater robotic device fitted with interfaces for sensors and instruments. The robot is designed for applications in law enforcement and underwater science in fresh and salt water.

At the heart of MADI is a complex operating system. Greer developed the "brains" of the robot, which allows it to operate and send critical data to remote computers for analysis.

"The beauty of MADI is that it can be tailored to meet the needs of any underwater mission," Krasowski said. "If first responders want to use it, we can fit the robot with metal detectors and sonar imaging equipment to locate underwater evidence in the murky depths of Lake Erie."

Beyond Earth, MADI could be a test platform for candidate instruments to study celestial bodies such as Titan. One of the moons orbiting Saturn, Titan, has many lakes of liquid methane. The study of astrobiology is always looking for biomarkers or biosignatures on other planets that point to signs of life. Krasowski believes scientists developing submersible instruments for Titan lake science missions in space could use MADI to perform underwater tests to prove the instruments on Earth.

The MARS team is working with the Cleveland Police and NASA researchers through 2014 to test and demonstrate MADI's multiple capabilities.

—By Nancy Smith Kilkenny

C-2014-149 Photo by Michelle M. Murphy

Senior research engineers Greer, left, and Krasowski equip MADI with sensors and imaging equipment depending on the mission.