



AEROSPACE

Frontiers

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Glenn employees win Government Invention of the Year

NASA's Inventions and Contributions Board (ICB) has announced that Dr. Bruce

rocket motor (SRM) joint design for the space shuttle. Their innovation is a unique, flexible braided carbon-fiber thermal barrier designed to withstand the extreme temperature environments in current and future solid rocket motors and other industrial equipment.

vention is recognized as a significant improvement over the current silicone joint-fill approach to safeguarding O-rings, which may allow hot combustion gases to penetrate the joint.



C-2005-352

Photo by Quentin Schwinn

Government Invention of the Year Award 2004 winners Dr. Steinetz and Dunlap developed a thermal barrier and solid rocket motor joint design.

Steinetz and Patrick Dunlap, Mechanical Components Branch, have won the prestigious Government Invention of the Year Award for 2004 for their work in developing a thermal barrier and solid

rocket combustion gases from reaching temperature-sensitive O-rings while still allowing 900 psi gases to position the O-rings in their grooves for proper sealing—a problem that has challenged rocket motor designers for decades. This inno-

As a case in point, Aerojet, manufacturer of the SRMs for the Lockheed-Martin Atlas V Evolved Expendable Launch Vehicle (EELV), used the Glenn thermal barrier technology to quickly recover from a dramatic full-scale test stand failure. In this test, 5500+ °F gases reached the O-rings and flange in the original joint design, severing the nozzle from the SRM. After incorporating three Glenn thermal barriers in their redesigned joint, Aerojet certified the new design to meet an aggressive schedule to launch a commercial satellite.

The breakthrough also promotes shuttle and astronaut safety and allows nozzle joints to be assembled in one-sixth the time of previous approaches with much higher degrees of reproducibility.

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Center maintains important role in NESC activities

During its first year of operation, the NASA Engineering and Safety Center (NESC) has seen a steady increase in requests for its technical expertise with more than 100 requests to date. The majority of fiscal year 2004 and early 2005 efforts supported the Space Shuttle and International Space Station (ISS) Programs. The NESC has also assessed high-risk programs across all mission directorates.

"NASA Glenn's civil servant and support service contractor community has provided outstanding support to the NESC," said Derrick Cheston, Glenn's NESC chief engineer. "To date, over 50 civil servants, contractors, and grantees have been involved with the NESC activities."

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Extraordinary twins

Hubble telescope marks 15th anniversary

The Hubble Space Telescope (HST), deployed in 1990, celebrates its 15th anniversary on April 25. Circling 600 kilometers (375 miles) above Earth about once every 95 minutes, Hubble has traveled over 3 billion miles and provided stunning photographic views, as well as answers to questions about the origins of the universe that were unavailable through ground-based telescopes.

Hubble's design included routine servicing missions, managed by NASA Goddard and performed by space-walking astronauts, to ensure first-class science through advanced technology. Glenn's Electro-Physics Branch Chief Bruce Banks, and senior engineers Kim de Groh and Joyce Dever, experts in vacuum ultraviolet radiation and atomic oxygen testing,

have contributed to all the Hubble service missions and continue to play a valuable role in HST maintenance by analyzing retrieved insulation from service mission 3-B.

Currently, de Groh is analyzing a section of retrieved bi-stem thermal shields and a section of solar array drive arm (SADA) insulation from solar array II. A group of students from Hathaway Brown School in Shaker Heights is collaborating on the analysis of SADA insulation. Their findings will be presented from May 8 to 14 at the Intel International Science and Engineering Fair.

While Hubble's life expectancy is under review, amazing discoveries continue to



Photo courtesy of NASA, ESA, and H.E. Bond

Hubble's view of the distant star, V838 Monocerotis.

be transmitted daily. For more information and imagery about Hubble, visit <http://hubblesite.org>. ♦

Online approval process ensures consistent NASA message

BY DOREEN ZUDELL

What does the public know about NASA? A recent independent study revealed conflicting answers to this question. While Americans respect the NASA name, they know little of what NASA does and even less about the benefits it provides. The report concluded that a positive and consistent message on NASA's mission, highlighting specific and personal benefits, is crucial to increased funding and overall support by the public.

Toward that goal, NASA's Strategic Communications Group initiated the Communications Material Review (CMR) Process earlier this year to aid in coordinating the Agency's overall messages and strategies internally and externally. One part of this strategy is to simplify communications efforts in a structured and coordinated manner. To accomplish this, an online system has been put into place to gather, approve, and archive all communications.

"The online process was designed to eliminate redundancies and conflicting messages in NASA's communication materials," explained Glenn's point of contact for CMR Sharon McCray, Facilities Division. "The process also provides guidelines for key messages and visual standards for all NASA communication materials."

The CMR is available to all users on the NASA internal network who are involved in the creation, approval, publication, and management of NASA communications. For further information, contact McCray at 216-433-8795 or log onto the site (internal only) at <http://communications.nasa.gov/portal/site/osc>.

Editor's note: Like other NASA nontechnical publications, Glenn's AeroSpace Frontiers must go through the CMR process. This caused the cancellation of the January issue (due to time constraints) and the delay of the February issue. We appreciate your patience as we work through this important new, evolving process. ♦

Gregory honored

Black Engineer & Information Technology magazine recognized NASA's Deputy Administrator Frederick Gregory as one of the 50 Most Important African-Americans in Technology for 2005. Honorees are selected based on their work in making technology part of global society. Their accomplishments are examples of the important contributions made by the half-million African-Americans in high-tech jobs.



Gregory

As Deputy Administrator, Gregory serves as the chief operating officer for NASA. He is responsible for directing and managing many of the Agency's programs as well as day-to-day operations and activities.

Information about the prestigious 2005 "50 Most Important African-Americans in Technology" list is available on the Web at <http://www.beya.org>. The information will also be published in the March-April Conference Issue. ♦

Glenn employees reflect on RTF efforts

BY S. JENISE VERIS

Discovering the cause of the *Columbia* accident proved to be a complex puzzle that included not only determining the cause but also developing solutions for repair. More than 200 NASA Glenn employees and state-of-the-art facilities were involved in solving the puzzle and helping to ensure the shuttle's safe Return to Flight (RTF).

One of these puzzle pieces included work by a team of metallurgists led by Dr. Anthony Calomino, Life Prediction Branch. The team performed a variety of nondestructive evaluations, microstructural studies, and mechanical tests on the shuttle's leading edge reinforced carbon-carbon (RCC) material to observe and document the strength degrading microstructural changes resulting from the high temperatures of reentry.



Dr. Calomino

"There were several months when it simply didn't seem like we could find enough hours during the day to meet the responsibilities of the RTF activities along with ongoing responsibilities," said Calomino. "However demanding the schedule, being involved with a program that's so important to NASA's space mission has its own reward. The experience has heightened my pride for the engineering profession."

Another RTF puzzle-solving effort involved Glenn's 8- by 6-Foot Supersonic Wind Tunnel, which was used to address an ongoing concern about foam shedding. These tests were prompted by the foam strike that caused the *Columbia* accident. In just 6 weeks, tunnel personnel and a fabrication model team, along

with other team members from across the Lab, designed, fabricated, and installed a model of the protuberance air load (PAL) ramp, an area identified as shedding foam. It is located next to cable trays on both the liquid hydrogen and liquid oxygen portions of the shuttle external tank. Data documenting the airflow environment over the PAL ramps is being evaluated for modification or removal of the ramps.



Williamson

"The timetable for this work was much tighter than most projects we test in the tunnel," said Scott Williamson, team lead, Aero Power and Propulsion Test Engineering Branch. "RTF activity 'bumped' a lot of the other work being done by my coworkers, but they admirably made the necessary adjustments. This was an important lesson in assigning priority to our work."

The major mission objectives of the STS-114 crew are to test and evaluate new flight safety procedures including shuttle inspection and on-orbit repair techniques. The Glenn-developed and manufactured GRABER (Glenn Refractory



Dr. Singh

Adhesive for Bonding and Exterior Repair) material was a candidate for the on-orbit repair kit. GRABER has since been tested as an adhesive or sealant in several other repair concepts. This includes sealants and gaskets for plugs, small patches, and flexible metallic and ceramic wraps for large area repair.

"It has been quite a challenging task—researching, developing, testing, and analyzing the various repair concepts, while simultaneously addressing a number of risks and operational safety issues," said GRABER lead Mrityunjay "Jay" Singh, QSS/Ceramics Branch. "However, the experience was made memorable by the opportunity to work personally with the astronauts and address their issues and concerns."



Clapper

Preparing the budget plans, tracking expenditures, and reporting RTF program funding ensured necessary resources were available. These efforts were conducted by Glenn's business lead for RTF programs, Carolyn "Carrie" Clapper, Space Operations Division.

"It's been very exciting to be involved in the RTF program," Clapper said. "My work responsibilities had high visibility within the Center and Agency, and it provided the opportunity to work with the researchers who were instrumental to ensuring the shuttle's safe return to flight."

Editor's note: These are just a few highlights of Glenn's contributions to the Agency's RTF Program and efforts to reduce risks in future missions. ♦

2004 CFC awards

Glenn's 2004 Combined Federal Campaign (CFC) chairperson Lesley Janosik, Life Prediction Branch, presented Center Director Dr. Julian Earls with the 2004 Northeast Ohio CFC Vice Chairperson Award on March 1. The Center also received the Northeast Ohio CFC Director's Award for Excellence in recognition of outstanding leadership and support of the campaign, and the Northeast Ohio CFC Certificate of Achievement for exceeding 100 percent of its dollar goal. Glenn raised a total of \$411,462.40. Pictured, left to right, are Glenn CFC executive-on-loan Eric Overton, Electro-Physics Branch; cochairperson Bernice Beznoska, Project Control and Support; Earls; and Janosik.



C-2005-313

Photo by Marvin Smith



C-2005-352

Photo by Marvin Smith

DeWine visits

Senator Mike DeWine visited Glenn on March 21 to meet with Center Director Dr. Julian Earls, senior management, and union leadership to discuss the President's fiscal year 2006 budget proposal. Later in the afternoon, the senator met with members of the local media to discuss his visit and address budget issues. He called the meetings at Glenn "constructive and helpful" toward these efforts. Pictured at the table, left to right, Deputy Director Richard Christiansen, DeWine, and Earls.

ISS downlink

Over 400 students from three NASA Explorer Schools—Farnsworth Aerospace Elementary Magnet School and Anwatin/Bryn Mawr Schools in Minneapolis, MN, and Cumberland Middle School in Milwaukee, WI—gathered at Crossroads Elementary School in St. Paul, MN, on February 8 for Minnesota's first International Space Station (ISS) downlink. In the months prior to the downlink, personnel from Glenn's Educational Programs Office, Space Operations Division, and Microgravity Division had been instructing students about microgravity research via e-mail and NASA Digital Learning Network videoconferences. During the ISS downlink, Expedition Ten Commander Leroy Chiao, a native of Milwaukee, and Russian Cosmonaut Salizhan Sharipov answered student questions about microgravity research and living in space.

RTF Canadian tour

Glenn Speakers Bureau member Matt Melis, Structures Division Ballistic Impact Laboratory, recently traveled to Canada to present an overview on the Columbia Accident Investigation and NASA's Return to Flight (RTF) Program (including Glenn's role in RTF). During an intensive 5-day tour, Melis gave presentations to the prestigious Ivey Business School in London, the Royal Astronomical Society of Canada at the Ontario Science Centre in Toronto, and two Toronto high schools. The tour culminated with presentations at Canada's Winterlude Ice Festival in Ottawa. The Ballistic Impact Laboratory has been shooting precision, high-density ice projectiles manufactured in Canada to produce shuttle impact damage assessments for the RTF Program. Pictured, right, Melis sits in the "Chill Out Lounge" at Ottawa's Winterlude Festival with one of Canada's future astronauts.

Photo courtesy of Julie Billows
National Capital Commission, Canada



Photo by Joe Waite, Cumberland Middle School





Ask the Director

The following question was chosen by the Director as a sampling from the *Ask the Director* Web site.

Q. The following questions are regarding the "Involuntary inter-Center reassignments" action to enable transformation. This action looks similar to a reduction-in-force, if someone decides not to relocate and quits. When will the process be made and communicated? Would someone be able to displace another person at his/her Center? If so, under what criteria (e.g., tenure, grade, ratings)? It would be interesting to see where we reside in the "pecking" order to estimate our level of security relative to the number of FTE reductions being considered.

A. (03/07/2005) You are referring to a management option referred to as a directed reassignment. A reassignment is the change of an employee from one position to another, for which he or she qualifies, without promotion or change to a lower grade. An agency may reassign an employee to any vacant position for which the employee is qualified. A directed reassignment is a reassignment directed by management, normally used when other placement options are not available or when the employee's skills or expertise is needed in a specific job. A directed reassignment can be made either within or outside the local commuting area. An employee who does not accept a directed reassignment may retire (if eligible), resign, or be separated under adverse action procedures. Reassignments are not subject to reduction-in-force procedures as long as employees are not involuntarily reduced in grade or the reassignment does not displace another employee. There is no requirement in OPM's regulations that directed reassignments must be made based on the four reductions in force retention factors (i.e., tenure, veterans' preference, length of service, and performance ratings). Currently, Glenn does not intend to consider retention standing in carrying out reassignments. As a part of our continued efforts to keep the workforce informed with the latest information, the answer to this question, as well as all others that deal with this topic will be posted as part of an expanded Frequently Asked Questions (FAQ) page at the Office of Human Resources and Workforce Planning Web site: <http://www.grc.nasa.gov/WWW/OHR/Transformation/>. ♦

News and Events

NASA's winning display

The Government On Display Expo, sponsored by Minnesota's Federal Executive Board (FEB), enabled Glenn's Community and Media Relations Office, with support from the Exploration Systems Division, to "bring NASA" to thousands of residents in the surrounding communities of Bloomington, MN, on January 29 and 30. Numerous NASA exhibits—from an actual space shuttle tire to a module on the Vision for Space Exploration—were on display in the Mall of the Americas' Sam Goody Rotunda and adjacent area. The centerpiece of the rotunda was the 20-foot tall Saturn V rocket with its lunar ascent engine staged nearby. Minnesota's FEB awarded trophies to the organization voted to have the best exhibit. NASA won first place among such Government agencies as the Armed Forces, Veterans Administration, and the National Weather Service.



Photo by Mack Thomas

News Notes

CHILI COOK-OFF: Join the fun at the 4th annual Great American Chili Cook-off, Friday, April 8, from 11:00 a.m. to 1:30 p.m. in the upper section of the Main Cafeteria. All proceeds benefit the Harvest for Hunger Campaign.

LESA MEETING: LESA/IFPTE, Local 28, will hold its next monthly membership meeting on Wednesday, April 13, at noon in the Employee Center, room 101.

FREE FAMILY FUN: On Saturday, April 16, Glenn's Visitor Center (VC) will present "Star Gazing." The VC will



collaborate with Schuele Planetarium, Lake Erie Nature and Science Center, and Cuyahoga Astronomical Association for this astronomy extravaganza. This back-by-popular demand Third-Saturday event will feature Twinkle Tots, comet making, Deep Impact and Mars Rover updates, and many special guests, including local meteorologist Dick Goddard. VC hours will be extended from 10 a.m. to 11 p.m. and the day will include loads of fun and exciting surprises. For more information and reservations, call 216-433-9653 or see visit.grc.nasa.gov.

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Government Invention of the Year Award

Innovation shows technology is critical to U.S.

Continued from page 1

NASA Senior Technologist Dr. Paul Curto, representing the ICB, affirmed, "This unique innovation is one of the best examples of how Glenn technology is critical to exploration, aerospace, and commercial activities all at once."

The new thermal barrier will enter service on Space Shuttle Mission STS-123, expected to launch in May 2007. The first Atlas V mission using the redesigned Aerojet SRMs launched the Rainbow direct-to-home digital TV satellite in June 2003. Subsequent flights launched the

AMC-16 satellite providing DISH Network service (December 2004) and the Inmarsat 4-F1 satellite delivering broadband communications to 86 percent of the world (March 2005).

NASA will use Atlas V to launch the Pluto Horizons Spacecraft in 2006. The Agency is also considering using Atlas V to launch payloads for the International Space Station, future Exploration Initiative missions, and versions of the Crew Exploration Vehicle.

The Invention of the Year Award warrants high respect by the ICB, according to NASA Chief Engineer Rex Geveden, who chairs ICB. "Our technical evaluation placed a present value on the (Glenn) invention at approximately \$25 billion dollars to America. Its use on the shuttle and Atlas V Programs represents mission-critical successes." ♦

This article was written by Laurel Stauber, Technology Transfer and Partnership Office.

IRIS: NASA keeps an eye on workforce safety

BY S. JENISE VERIS

Glenn's Safety Office is rolling out the Agency's new Incident Reporting Information System (IRIS). This Web-based health and safety data management system empowers employees to take ownership of NASA's safety

mishap process by reporting safety incidents themselves (reporters may remain anonymous).

An Agencywide team of system administrators worked with Efficient Enterprise Engineering, Inc. (Ex3™), to customize a

version of Ex3's larger server-based system that addresses NASA's specific needs. Suzanne Otero, Risk Management Office, is the Agency administrator for IRIS located in the Assurance Technology Center at OAI.

"IRIS came about with the call for improved accountability cited in the Columbia Accident Investigation Board Report," said Glenn's point of contact for IRIS Mark George, Safety Office. "IRIS reduces incident report redundancy and paperwork, while enabling NASA to track trends for improved efficiency and lessons learned."

IRIS replaces NASA Forms 1627 (NASA Mishap Report) and 1627B (NASA Medical Safety Incident Report) mandated under NPR 8621.1A, NASA Procedural Requirements for Mishap Reporting, Investigation, and Record Keeping.

Glenn employees can access IRIS via the "Glenn Workplace" link on the Intranet, where a report is generated and tracked by selecting one of three modules: Safety, Health, or Track. "Data submitted will be given a case number and tracking number, which allows the submitter to verify

Ombuds promote communications

Sometimes an informal chat about workplace issues can accomplish more than negotiating formal channels of communication.

The Agencywide Ombuds Program, established in February 2004, provides the workforce (civil servants, contractors, and students) with an alternative channel of communication to discuss significant concerns about organizational performance, safety, or mission success.

Terri Rodgers, Engineering and Technical Services Directorate, is serving as Glenn's ombud. "My role is that of an independent, neutral person who assists in resolving conflicts and addressing concerns in a confidential manner. I'm also a safety valve when employees feel regular channels for raising issues and concerns are not working effectively."

When issues are brought to Rodgers, she may assist in the formation of options, seek to promote a mutually satisfactory resolution of the issue or concern, or discuss matters directly with Center management.

Employees may bring concerns in confidence to Rodgers at 216-433-8740. For more information on the Ombuds Program, see <http://ombuds.grc.nasa.gov>. ♦



Rodgers

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Most NESC activities focused on Return to Flight

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In support of the Space Shuttle Program, the NESC has been called upon to support preparation for Return to Flight. In some cases the NESC has performed an independent set of tests or analyses



Dr. Wilfredo Morales, Mechanical Components Branch, gathers grease samples from a gear for analysis of grease degradation.

and developed findings and recommendations for the program. In other cases it obtained experts from sources within and outside the Agency to assist the program in understanding critical problems and developing solutions. In addition, there has been a proactive activity aimed at identifying unrecognized risks and vulnerabilities that currently exist within the Space Shuttle Program.

Specific shuttle-related NESC endeavors where Glenn has contributed include the following:

- Evaluation of crack in reaction control system thrusters
- Structural integrity of graphite-epoxy and Kevlar overwrapped pressure vessels
- Identification of critical recurring anomalies
- Evaluation of performance of orbiter actuators
- Evaluation of risks and mitigation measures for space shuttle main engine flowliner
- Evaluation of potential hazards associated with orbiter reaction jet driver misfires
- Participation in External Tank Design Certification Review

- Evaluation of ply separation on reusable solid rocket motor nozzle.

NESC has provided independent, in-depth assessments for other programs and projects. The following examples have involved experts from the Center:

- Proactive review of ISS recurrent problems and potential unrecognized vulnerabilities
- Assessment of life expectancy for Hubble Space Telescope batteries
- Assessment of spacecraft propulsion bus design for the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations (CALIPSO) satellite.

In addition to the short-term assessments and evaluations, NESC has established

13 discipline-focused Super Problem Resolution Teams. These teams are composed of a cadre of technical experts from across the Agency serving as a virtual team for proactively addressing discipline-specific issues as well as a ready network for addressing problems. Several Glenn engineers and scientists are active participants in these teams.

"The NESC was established to perform in-depth technical assessments for critical projects to ensure safe design and operations," Cheston said. "This work can only continue through the ongoing commitment to safety and engineering excellence as demonstrated by the Glenn community."

If you would like to learn more about the NESC or submit a request for an assessment, contact Cheston at 216-433-3879, or visit the NESC Web site at www.nesc.nasa.gov. ♦

Black History Month program features local pastor and activist

Glenn's Black History Month program in February featured a thought-provoking presentation by Rev. Dr. Otis Moss, Jr., activist and pastor of Olivet Institutional Baptist Church, and the lively dance of the Karamu Folklore Company. Moss explained why studying the history of a culture is so important to developing the conscience of a society. He illustrated with examples how ignorance and hatred, when left unchecked, has led to inhumane treatment of African, Indian, and Jewish people. This year, Black

History Month also celebrates the 100-year anniversary of the Niagara Movement (1905-1910), forerunner to the National Association for the Advancement of Colored People (NAACP), which serves as a catalyst for renewed efforts to improve the rights of blacks and respect for all people. Moss's presentation at Glenn was cosponsored by Glenn's African Heritage Advisory Committee and the Office of Equal Opportunity Programs.



Left: Dr. Moss spoke to a packed auditorium. Right: The master drummer and a dancer from the Karamu Folklore Company.



Photos by Marvin Smith

C-2005-346

C-2005-345

Some of NASA's finest bid farewell to Center

The following retirees, taking part in the December 2004-January 2005 buyout and/or earlyout, are the remainder of the employees who have requested that their information and/or photograph be published in the *AeroSpace Frontiers*.

Marcia Bellamy, Power and Electrical Propulsion Division, retired on January 3, 2005, with 30 years of Federal service, including 21 with NASA.

Robert Braun, Space Power and Propulsion Technical Branch, retired on January 3, 2005, with 37 1/2 years of NASA service.

Howard Eakin, Research Testing Division, retired on January 3, 2005, with 36 years of Federal service, including 34 with NASA.

Norman Fallert, Research Testing Division, retired on January 3, 2005, with 43 years of Federal service, including 42 1/2 with NASA.

Vance Farrow, Facilities Engineering and Architectural Branch, retired on January 3, 2005, with 32 1/2 years of NASA service.

Pablo Gutierrez, Research Testing Division, retired on January 3, 2005, with 27 1/2 years of Federal service, including 24 1/2 with NASA.

Thomas Hill, Systems Engineering Division, retired on January 3, 2005, with 40 1/2 years of Federal service, including 38 1/2 with NASA.

Gregory Kelbach, Jr., Space Combustion and Microgravity Technical Branch, retired on January 3, 2005, with 36 years of NASA service.

Michael Lelak, Engineering Development Division, retired on January 3, 2005, with 33 years of Federal service, including 18 with NASA.

Gary Loder, Central Process Systems Operations Branch, retired on January 3, 2005, with 30 years of Federal service, including 26 with NASA.

John Naglowsky, Space Power and Propulsion Technical Branch, retired on January 3, 2005, with 38 years of NASA service.

Joan Oravec, Computational Sciences Branch, retired on January 3, 2005, with 32 1/2 years of NASA service.

August Scarpelli, Engineering Development Division, retired on January 3, 2005, with 29 years of NASA service.

Andrew Sheparovich, Facilities Division, retired on December 31, 2004, with 17 years of NASA service.

Merry Sherrod, Program and Policy Office, retired on December 31, 2004, with 21 1/2 years of NASA service.

Albert Shott, Aviation Environments Technical Branch, retired on December 31, 2004, with 42 1/2 years of NASA service.

Michael Skor, Exploration Systems Division, retired on December 31, 2004, with 36 years of Federal service, including 32 with NASA.

Ronald Sobolewski, Aviation Environments Technical Branch, retired on December 31, 2004, with 42 1/2 years of NASA service.

Donna Stocker, Life Support and Habitation Projects Branch, retired on December 31, 2004, with 31 years of Federal service, including 18 with NASA.

Mary Tharp, Project Control Office, retired on December 31, 2004, with 25 years of NASA service.

Christine Titran, Technology Transfer and Partnership Office, retired on December 31, 2004, with 38 1/2 years of Federal service, including 38 with NASA.



Braun



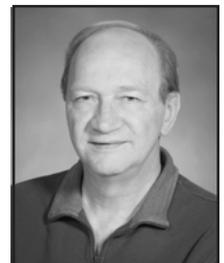
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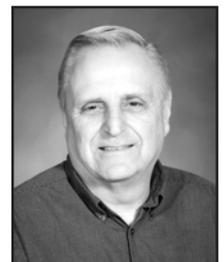
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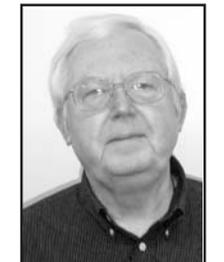
Skor



Sobolewski



Titran



Zusan

Gunnar Zusan, Procurement Division, retired on December 31, 2004, with 21 1/2 years of Federal service, including 19 1/2 with NASA.

Glenn celebrates Earth Week in April

Glenn's Earth Day Committee is planning a variety of onsite and offsite displays, events, and activities for employees to celebrate Earth Week.

The festivities kick off on April 17 with Glenn's participation in Earthfest at the Zoo, an annual family event that attracts numerous environmentally friendly exhibitors and thousands of visitors.

Glenn's main event activities will occur on April 21 and 22, when many environmental displays—such as a storm-water runoff model and alternative fuel vehicles like the Ford Escape, the Toyota Prius, and the Great Lakes Brewery's Fatty Wagon, fueled by cooking grease—will be on view in building 15's first floor and outside (weather permitting). Find out how

to care for your lawn organically, talk to a naturalist, and drink coffee that benefits Third-World farmers. Recycle that old cardboard and paper in your bookcase. Refreshments and music are planned for both days.

Also, during the week of April 18 to 22, other Earth Week events are planned. Glenn's Aerospace Environmental Traveling Exhibit Bus (AeroBus) will visit Lewis Little Folks on April 19 to augment the child development center's weeklong nature and environmental activities. The bus will travel to Youngstown State University to appear at the annual NASA-hosted Earth Day Awareness event on April 20.

There will be other events scattered throughout April, such as an Abram Creek cleaning, tree plantings, and a



bike-to-work day. The dates will be determined by the weather.

April 22 marks the 35th anniversary of this country's first Earth Day. Glenn's Earth Day Committee is hopeful that Center employees will find ways to protect our planet, our children, and our future. Come and be a part of it!

Look for updated details on these and other Earth Week events on *Today@Glenn*, or visit <http://earthday.grc.nasa.gov>. ♦

Center brings NASA to CIAA Basketball Tournament

Glenn supported NASA's partnering event with the Central Intercollegiate Athletic Association (CIAA) to form a new all-star team of America's next generation of leaders and explorers at this year's CIAA Basketball Tournament held from March 1 to 5 in Raleigh, NC.

Photo by Stephanie Brown-Houston



The CIAA is composed of 10 Historically Black Colleges and Universities in North Carolina and Virginia. With more than 100,000 attendees, the tournament served as an excellent venue for NASA to encourage students from under-represented populations to pursue careers at NASA and other science, technology, engineering, and mathematics (STEM)-related fields.

Members of Glenn's External Programs Directorate, together with staff from Langley, Marshall, and Headquarters, coordinated a NASA Awareness Days Program that featured Astronaut Leland Melvin. Activities offered throughout the tournament included hands-on scientific workshops, interactive exhibits, a full-scale Mars Rover Exhibit, the

SEMAA students perform a practice run with their Lego robot.

Vision Station, the Mobile Aeronautics Education Laboratory, and the "Picture Yourself as an Astronaut" display.

A highlight of the event was the NASA SEMAA Robotics Challenge where teachers and students from three NASA Science, Engineering, Mathematics, and Aerospace Academy (SEMAA) sites and five public schools participated in a competition that required a formal presentation and demonstration of each team's robot on simulated Mars landscapes.

"NASA's involvement in this tournament is another example of creative partnering the Agency is pursuing to spark student interest in STEM disciplines," said Stephanie Brown-Houston, Glenn's liaison for CIAA, Office of Educational Programs. "Activities such as these build a pipeline of talent that will be available to fulfill the Vision for Exploration and maintain America's preeminence in science and technology." ♦

People

Patents

A patent entitled "Microelectromechanical Systems (MEMS) Direct Chip Attach Packaging Methodologies and Apparatuses for Harsh Environments," was issued to **Dr. Robert Okojie**, Sensors and Electronics Branch, on January 25, 2005. This patent contains methods of bulk manufacturing high-temperature sensor subassembly packages. The innovation describes various methods of fabricating packages suitable for protection of electronic devices and sensors in high-temperature environments. Primary funding for development of the methodology was provided through the Glennan Microsystems Initiative with additional support from the Technology Transfer and Partnership Office and the Propulsion 21 project for test analysis at Glenn and offsite.



Dr. Okojie



Dr. Simons

A patent was awarded to **Dr. Rainee Simons**, Electron and Optical Device Branch, on January 18, 2005, for his invention entitled "Microelectromechanical Systems (MEMS) Actuator Based Reconfigurable Printed Antennas." MEMS actuators have the potential to dynamically reconfigure the frequency, polarization, and radiation pattern of antennas essential for undertaking diverse exploration missions. In addition, MEMS actuators allow systems to be reconfigured following initial deployment, thus enabling adaptation to new circumstances as well as evolution to a more complex system. This work was supported by the Computing, Information, and Communications Technology Program.

Honors



Cynthia Williams, a graduate of the 2004 Pre-Apprentice Machining Program at Glenn, was honored with the 2004 Outstanding Achievement Award from the City of Cleveland. She was recognized for her commitment to, and excellence in, pursuing the non-traditional field of machining, successfully completing the program, and obtaining employment in the field. Williams was selected from the field of 5500 customers that were served by the City's Workforce Investment Board this past year.

Pictured at the awards breakfast, left to right, are Jean Wells and Chuck Smalley, Prototype Development Branch; Williams; Jessica Malloy, WIRE-Net; Rick Reames, Mechanical Design Branch; and Carley Severo, Employment Connection, City of Cleveland.

Ronald "Joe" Sovie, former NASA research physicist and manager, was posthumously honored with the Schreiber-Spence Space Achievement Award during the Space Technology and Applications International Forum, held in February. Established by the University of New Mexico's Institute for Space and Nuclear Power Studies in honor of Raemer E. Schreiber and Roderick W. Spence, forefathers of the Los Alamos

National Laboratory's nuclear propulsion rover programs, the award recognizes pioneering and technical excellence that has contributed to advancing space technologies and applications, public service, and leadership. Sovie retired from Glenn in January 2003 following 42 years of NASA service. He died in October 2004.



Sovie

CORRECTION: **Dr. John Foster**, an aerospace engineer in the Power and Electrical Propulsion Division, was incorrectly identified as an Analex employee supporting the Engineering and Technical Services Directorate in the Black Engineers Award article found under the People column of the March 2005 *AeroSpace Frontiers*.

**Mark your calendar for
NASA Glenn's
State of the Center Address
scheduled on
Wednesday, April 20.**

AeroSpace Frontiers is an official publication of Glenn Research Center, National Aeronautics and Space Administration. It is published the first 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. Its circulation is approximately 6700.

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DEADLINES: News items and brief announcements for publication in the May issue must be received by noon, April 15. The deadline for the June issue is noon, May 12. Submit contributions to the editor via e-mail, doreen.zudell@grc.nasa.gov, fax 216-433-8143, phone 216-433-5317 or 216-433-2888, or MS 3-11. Ideas for news stories are welcome but will be published as space allows. View us online at <http://AeroSpaceFrontiers.grc.nasa.gov>.



News Notes

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GLENN BPW SCHOLARSHIPS: The NASA Glenn Business and Professional Women's (BPW) organization is sponsoring two \$450 scholarships for a Glenn civil servant or contractor woman to continue her career advancement studies. The deadline is April 22, 2005. Contact Erlene Trsek, 216-433-9394 for an application.

BILL RETIREMENT CAKE AND COFFEE: Cake and coffee will be served on Friday, April 29 from 1:30 to 3:30 p.m. in the Ad Building Foyer for Dr. Robert (Bob) Bill's retirement. Stop by to see Bob and wish him a fond farewell. For information, contact Margie Mitchner, 216-433-3722, or Janet Closs, 216-433-2488.

SUNSHINE GOLF: The NASA Sunshine (mixed) Golf League is looking for new members of all levels. Play on Thursdays at Riverside Golf Club, Columbia and Sprague Roads, Columbia Station, April 21 through September 15. Select a tee time from 3:30 to 5:00 p.m. (earlier or later times possible) each week to meet your schedule. Tee off after 4 p.m. and play until dark. It is noncompetitive. Greens fee are \$10.50. Dues are \$30 and include picnics, prizes, and a banquet. Contact Bob Mattingly at 216-433-3068.

AFGE MEETING: AFGE Local 2182 will hold its next monthly membership meeting on Wednesday, May 4, at 5 p.m., at Denny's Restaurant, 25912 Lorain Road, North Olmsted. All members are encouraged to attend.

LLF GOLF OUTING: Lewis Little Folks (LLF) onsite child development center will host its fifth annual benefit golf outing on Friday, June 3, at Springvale Golf Course, North Olmsted. The event begins at 8 a.m. (shotgun tee-off). The cost is \$70 per golfer (\$25 tax deductible) and includes greens fees, cart for 18-hole game, dinner, golf kit, and prizes. Entry deadline is May 13. Contact Carmella Genaro, 216-433-5264.

@your library™

Library Open House

Glenn's Library will host an open house to celebrate National Library Week (April 10 to 16) on Wednesday, April 13 from 10 a.m. to 3 p.m. in the Main Reading Room of the library in building 60. Festivities will include the premier of two new information resources, vendor product updates and demonstrations, and giveaways.

Confirmed vendors for the event include Michael Petro of IEEE, Elaine Tomaselli of Thomson/ISI, and Kurt McIntyre of NASA Center for Aerospace Information. Each vendor will conduct product demonstrations detailing updated features, search tips, and more. The Lunch and Learn featured speaker will be Bruce Banks, Electro-Physics Branch chief, discussing "Earthly Applications of Space Atomic Oxygen." Bring your lunch to the Main Library Reading Room at noon and enjoy this interesting presentation about atomic oxygen's applications in art restoration and document forgery detection.

Employees will also have an opportunity to attend a special presentation on April 14 featuring Homer Hickam, former NASA employee and author of *Rocket Boys*, the featured text for the 2005 Cleveland Area Metropolitan Library System's Share A Book program. The film *October Sky* was based on Hickam's book.

In Appreciation

To my "NASA family," words cannot express my heartfelt appreciation for your love, support, prayers, cards, flowers, phone calls, donations, and hugs. The sudden loss of my husband, Danny, has been overwhelming, and your outpouring expressions of sympathy, in any form, has truly touched my heart and given me strength. God bless you.

—Debbie Burak

It's never easy to overcome the loss of your mom, but thanks to our friends and

coworkers at Glenn, we are mending well. Your thoughtful expressions, prayers, and cards of sympathy are greatly appreciated.

—Christopher and Peter Kennedy

Thank you all for the warm wishes on my retirement. I truly will miss my friends and colleagues that I've grown to know over my years at NASA. You are just the best and I'm fortunate that NASA provided me the opportunity to work with you. Best of luck to all of you.

—Joanne Duta

Web-based safety reporting system

Continued from page 6

the follow-up action resulting from the mishap report," said IRIS administrator Deborah Ripley, SAIC/Glenn Safety Office.

While training is not necessary for access, Glenn Safety Office processors, representatives from Medical Services, and Glenn prime contractors with overarching authority have been trained to use the system. Over the next 3 to 5 months, all civil servant supervisors will be trained and assigned individual accounts.

Look for IRIS updates on *Today@Glenn*, Glenn TV, and an information booth scheduled for display on April 7 in the Main Cafeteria. ♦

Rovers energize Mars mission planning

BY S. JENISE VERIS

Chances are no ordinary two-year-old twins could accomplish what *Spirit* and *Opportunity* have in their brief existence. Indeed, the Mars Exploration Rovers (MER) have been nothing short of extraordinary as they traverse the Red Planet making amazing discoveries that continue to awe the public and energize NASA's Vision for Space Exploration.

This month marks 1 year since the successful conclusion of the original 3-month MER mission. From January to April 2004, *Spirit* and *Opportunity* enabled critical science to be conducted at opposite poles of the planet, which determined that Mars had persistently wet, possibly life-sustaining environments. The magnitude of its discoveries spurred the editors of *Science* magazine to proclaim the MER mission the scientific breakthrough of the year.

As an incredible and unexpected bonus, the rovers have continued to be functional for the entire year since their landing.

Glenn's Dr. Geoffrey Landis, Photovoltaic and Space Environments Branch, feels fortunate to have gained such valuable experience and results from the mission as a member of the MER science team. Landis sought an enhanced understanding of Martian dust, and the role it plays in both the Mars climate as well as the long-term operation of solar arrays on the surface.

"We are seeing dust deposit on the solar arrays, as we expected," Landis explained, "but what surprised us was seeing the dust being removed, given the density of Martian atmospheric dust. While *Opportunity* was parked in a crater, on two separate occasions, we had days when the solar array power increased as much as 5 percent from dust blowing off."

While the longevity of the rovers has enabled additional discoveries, anticipation of NASA's next Mars mission is mounting. In August, the Mars Reconnaissance Orbiter will launch aboard an Atlas V rocket from Cape Canaveral Air Force Base, FL.



Dr. Landis pictured with a Mars rover model on display at NASA's Jet Propulsion

Considered the most challenging mission to Mars yet, the orbiter will explore areas too dangerous for humans or even robots from above the planet's landscape. Its suite of scientific instruments will enable an ambitious set of science objectives to "follow the water," making the mission an important part of the NASA Mars Exploration Program. The overall goal is to shed light on Mars' changing climate, geologic history, and potential ability to harbor life.

For additional information about the rovers, visit http://www.nasa.gov/vision/universe/solarsystem/mer_main.html. ♦

National Aeronautics and Space Administration

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