



AEROSPACE

Frontiers

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State of the Center 2002

New NASA—One NASA

BY DOREEN ZUDELL

In his State of the Center 2002 address, *New NASA—One NASA: Glenn's Contributions*, Center Director Donald Campbell spoke of "revolutionary changes" over the year that will transform NASA into a more focused and unified Agency.

Topping the list of changes at NASA are a new Administrator, the first deputy administrator named in more than a decade, and a leadership team comprised of many newcomers to the Agency and new colleagues from the Department of Defense and the Office of Management and Budget. Director Campbell also emphasized the large number of new appointments within the centers, ranging from center directors and deputies to associate administrators.

"Guided by the President's Management Agenda, the Administrator will work with the Headquarters team and throughout the field centers to reshape the Agency, focusing on (1) fiscal and management discipline, and (2) the work that NASA does best," Campbell explained. He cited Freedom to Manage and the Integrated Financial

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A review from the view up there

BY S.JENISE VERIS

Back from a record-breaking assignment aboard the International Space Station, crewmates Air Force Colonel Carl

Walz and Navy Captain Daniel Bursch graciously navigated a full schedule of events during their post-mission visit and review at Glenn on October 21.

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Walz and Bursch, who served as flight engineers on Expedition Four, broke the previous U.S. spaceflight endurance record of 188 days during their 196-day stay aboard space station. The duo, who were also crewmates on the STS-51 mission that

Astronauts Carl Walz (left) and Daniel Bursch presented a special commemoration of their stay on the International Space Station to Center Director Donald Campbell.

IFMP goes live

Late in October, the Core Financial and Travel Manager modules of the Integrated Financial Management Program (IFMP) became operational at Glenn. Users were gradually added to the system and within 10 days the total number of activated users was approximately 1900. The Core (SAP software) module includes accounts payable, accounts receivable, general ledger, purchasing, cost management, budget execution, and a business data warehouse with reporting capability. Travel Manager is a Gelco product. Marshall and some elements of Headquarters went "live" at the same time. The other NASA centers will follow with implementations in February and June of 2003.

The conversion from the Center's legacy accounting and travel systems

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NASA missions chosen for *Popular Science* magazine award



Top left, Aqua satellite; top right, Mars Odyssey; bottom, Grace.

NASA's unprecedented work in Space Science and Earth Science captured three of *Popular Science's* Best of What's New Awards for 2002. The Mars Odyssey mission and the twin satellites of the Gravity Recovery and Climate Experiment (GRACE), managed by the Jet Propulsion Laboratory; and the Aqua spacecraft mission, managed by Goddard Space Flight Center, were chosen in the Aviation/Space category. *Popular Science* will feature the 100 winners, chosen in ten categories, in its December 2002 issue. *Popular Science* annually

reviews thousands of new products and innovations. To win, a product or technology must represent a significant step forward in its category.

NASA to develop biohazard smoke detector

Researchers at the Jet Propulsion Laboratory (JPL) have entered into an agreement with Universal Detection Technology of Beverly Hills, CA, to mutually develop a commercially available anthrax "smoke detector." The system will combine JPL spore detection technology with Universal's aerosol capture device for constant and unattended monitoring of spaces such as public facilities and commercial buildings. The system currently used by Universal, a public company specializing in environmental monitoring technologies, cannot distinguish between inorganic particles or biological substances such as bacterial spores. JPL's detection technology discriminates against detecting aerosol components, such as dust, and sounds an alarm when it detects a significant increase in spore count. For the next 10 months, JPL will work to incorporate bacterial spore detection technology to make the device sensitive enough for use by Universal as a bioterrorism warning monitor.

NASA funds improvement in lightning prediction

A new lightning index that combines measurements of water vapor in storm clouds with data from Global Positioning Systems (GPS) has improved lead-time for first lightning strikes from thunderstorms. The index will improve forecasts and advance warning to help reduce delays or cancellations of space shuttle launches at Kennedy Space Center (Kennedy) and other commercial and Department of Defense launches from Cape Canaveral Air Force Station. It combines four predictors, including a prediction tool of atmospheric electric charge, the amount of water vapor detected in a cloud or air mass, the change in the amount of that water vapor over 9 hours, and a scale called the "K Index" that predicts how unstable the air will become. One GPS receiver is located at Kennedy due to the region's high incidence of lightning. This research was supported by the U.S. Air Force and National Oceanic and Atmospheric Administration with additional funding provided by NASA and the Department of the Navy, Office of Naval Research under the Pacific STARNET program.



Lightning strikes Complex 39-A launchpad at Kennedy.

George Abbey to retire

In a distinguished Federal service career that spanned a half-century, George W.S. Abbey announced his retirement from NASA, effective January 3, 2003.



Abbey

Abbey leaves the Agency after a highly decorated aerospace career, which included the Medal of Freedom, the Nation's highest civilian award, for his role on the Apollo 13 Mission Operations Team.

In February 2001, Abbey became the senior assistant for International Issues reporting to the NASA Administrator. Subsequently, he was appointed as a senior visiting fellow at the James Baker Institute for Public Policy at Rice University. He is also working with the University of Texas at El Paso to enhance the University's engineering and science programs and to encourage young students to pursue careers in science and engineering.

Since joining NASA in 1964 as the Air Force captain assigned to the Apollo Program, Abbey has held numerous positions such as technical assistant at Johnson Space Center, director of Flight Operations, deputy associate administrator for Space Flight at Headquarters, and deputy director of Johnson to name a few. ♦

UEET recognized for leadership

As part of NASA's program management shared experiences, each Enterprise was asked to showcase the best projects for the 2002 Project Management Shared Experience Program. The Ultra-Efficient Engine Technology (UEET) Program, managed out of Glenn, was selected by the Aerospace Technology Enterprise to receive the 2002 Academy of Program and Project Leadership (APPL) award. Seven other projects from Codes M, S, U, and Y were also recognized with the APPL award. ♦

Microgravity combustion science grants awarded

Headquarters release

Two members of the Microgravity Science Division and the National Center for Microgravity Research (NCMR), located at Glenn, were among the 22 researchers selected to receive NASA grants totaling approximately \$8.6 million to conduct microgravity combustion ground-based research. Nine of the grants represent continuing research while 13 represent new research, all sponsored by the Office of Biological and Physical Research.

Investigators will have NASA's microgravity research facilities, such as drop tubes, drop towers, and aircraft flying parabolic trajectories, at their disposal to improve the understanding of fundamental physical and chemical processes associated with combustion. NASA received 90 proposals in response to its research announcement. All proposals were peer-reviewed by scientific and technical experts from academia, government, and industry.

The following local researchers received grants: from Glenn, Dr. Daniel Dietrich, for "Diffusion Flame Suppression in Microgravity using Spray Agents," and Michael Hicks, for "Low Re Number Droplet Combustion in CO² Enriched Atmospheres in Microgravity;" and from NCMR, Dr. Peter Sunderland, for "Investigation of Velocity and Temperature in Microgravity Laminar Jet Diffusion Flames," and Dr. Randy Vander Wal, for "Quantification of Fire Signatures for Practical Spacecraft Materials." Case-Western Reserve University Professor Chih-Jen Sung was also a grantee for "Catalyzed Combustion in Micro-Pulsion Devices." ♦

Headquarters' Appointments

Gwendolyn Brown has been named NASA's deputy chief financial officer. She manages day-to-day financial operations, directs the preparation and submission of annual financial and related reports, and coordinates Agency financial management activities with other related Federal agencies. Prior to coming to NASA, Brown was a senior program analyst with the Office of the Under Secretary of Defense, Directorate for Program and Financial Control at the Pentagon. She replaces Stephen J. Varholy, who retired in September, and interim Acting Deputy Kenneth J. Winter, who returns to his duties at Langley as the center's chief financial officer.



Brown



Loston

earned a master of education and doctorate in educational administration and supervision from Bowling Green State University, OH.



Rudolphi

Dr. Adena Williams Loston, the former senior advisor to the Administrator for Education, was named the new associate administrator for Education. She will be responsible for guiding NASA's efforts to organize and enhance Agency education programs. Prior to her appointment, Loston served as president of San Jacinto College, South campus, in Houston, TX, for 5 years. She is a member of numerous professional associations and has received many awards during her career including the Distinguished Alumni Award (Higher Education) from Alcorn State University, MS, the Shirley B. Gordon International Presidential Award of Distinction, Phi Theta Kappa Honor Society, and the Texas Association of Black Personnel in Higher Education, Presidential Award. She

Michael U. Rudolphi has been named deputy center director for John C. Stennis Space Center. As deputy director, Rudolphi will support Center Director William W. Parsons in managing NASA's rocket propulsion test capabilities and Earth Science applications. Rudolphi has served as manager, Reusable Solid Rocket Motor Project, at the Marshall Space Flight Center since January 2000. He began his career with NASA at Marshall in 1988 as facility manager for the Advanced Solid Rocket Motor Project in Luka, MS. There he managed the design, construction, and operation of an ultramodern \$700 million rocket manufacturing facility. ♦

Bonnie Dunbar inducted into NAE

Johnson Space Center release

Astronaut Bonnie J. Dunbar, Johnson Space Center assistant director for University Research, has been elected to membership in the National Academy of Engineers (NAE). Dunbar was inducted based on "personal leadership and significant career contributions to engineering design problems in human spaceflight and to on-orbit operations." NAE induction is considered one of the highest professional honors for engineers.



Dunbar

In addition to a spaceflight career that spanned five shuttle missions, Dunbar has remained active in engineering design programs. She was instrumental in the design and development of several on-orbit research facilities and orbital research operational protocols. She also led efforts to develop specific criteria for identifying on-orbit laboratory safety rules. ♦



C-2002-2013

Photo by Marvin Smith

Metalworking skills

During the 4th Annual NASA/WIRE-Net Pre-Apprentice Machining Program graduation ceremony on October 18, eight students received certificates for successfully completing a rigorous 32-week training program in metalworking and earned certificates in Level I certification from the National Institute of Metalworking Skills. The President of Jegens, Inc., Jack Schorn, Jr., served as keynote speaker affirming the importance of the skills students developed through the program at Glenn and its importance to the metalworking industry. Steven Sims, director of Economic Development for the City of Cleveland, representing Mayor Jane Campbell's office, offered closing remarks. Graduates, pictured left to right, (standing) are Shawn McGan, James Roberts, Ramon Torres, Ramon Steward, (seated) Jonathan Roberts, Colleen Murphy, Brenda Fialko, and Robert Major.



Halloween fun

Spirits were lifted at the 5th annual Halloween Party and Costume Contest sponsored by the Glenn Exchange. The crowd enjoyed refreshments and had a good laugh watching coworkers



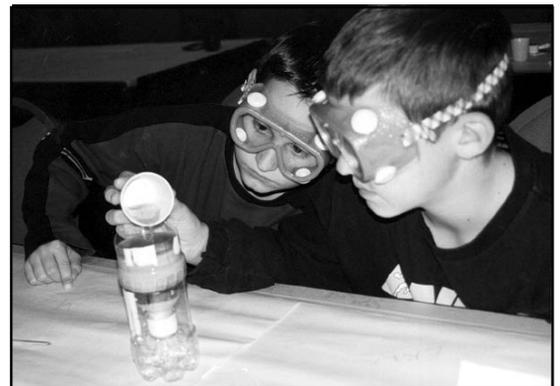
Photo by Mark Bettlejewski

parade around the Main Cafeteria in their zany costumes. The difficult job of judging went to External Programs Director John Hairston, Jenise Veris (IDI/9300), and Rick Bleich (5880). Finalists received a \$25 Exchange Store gift certificate. Funniest: Kay Collins (EXCH/0200), 1st for a cow; Geoff Landis (5410), 2nd for carnival lady; and Alecia Evar (IDI/7160) and Olga Quiles (7190), 3rd for chaps and chafe. Scariest: Bruni Quinones (ANLX/6711), 1st for a witch; and Steve Hippensteele (5820), 2nd for spooky ventriloquist. Most creative: Karen Cristino (QSS), 1st for a pimp; Ruth Jackson (ZINT/7700), 2nd for a princess; and Pam Bates and Patty Meldrum (CIT/0620), 3rd for Hawaiian tourists. Pictured, left to right, are Karen Cristino and Geoff Landis in their award-winning costumes.

Aha! Focus on chemistry

Small miracles were revealed to more than 25 students in grades 2 through 5 who participated in activities designed to demonstrate how "Chemistry Keeps Us Clean," the theme for National Chemistry Week 2002. Faded laundry items were restored; "yuck" was removed from simulated sewer water; and a spider's ability to walk across water without sinking was discovered during two 1-hour sessions held October 26 in Glenn's Visitor Center. Glenn staff with college student affiliates from the Cleveland chapter of the American Chemical Society assisted. Students used a homemade filtration system to remove various contaminants from water and performed hands-on experiments with surface tension and water hardness to determine their effects on cleaning. A comparative study on the effectiveness of different chemicals used as cleaning agents to fight stubborn stains such as ketchup, chocolate, and permanent marker concluded the day's activities. Pictured are Michael Lukco, left, and Eric Illig teaming up on the water filtration experiment.

Photo by S. Jenise Veris



Ride for the cure

Sharon Lewis (IDI/0220) once again organized a successful motorcycle poker run to benefit the Susan G. Koman Foundation. More than 1100 registered for the run held September 8. The final stop at the Irish Heritage Center in Avon Lake included a classic car show and performances by bands who have Glenn membership—Hypnotic Dog, Strangers from the Street, and Trail Hawgs. Lewis' efforts raised over \$24,000. Pictured, left to right, are Sally Saltzman (0220), Lewis, and Karen Matyas (0220).



Director's Corner
With Donald Campbell

Giving throughout the year

At this time of year, Americans traditionally place emphasis on activities that involve the acts of sharing and caring, but I believe that our employees do an excellent job of reaching out to others throughout the year.

Glenn's continued commitment to the Combined Federal Campaign is a shining example of our employees giving of themselves—through their time, talent, and donations—to others in our Nation. Furthermore, activities such as the Shoe Fund, Special Children's Fund, Harvest for Hunger, Habitat for Humanity, and the onsite Red Cross blood drives show how our support service contractors join with civil servants to reach out to those in need. I'm also aware that many employees champion additional causes outside of the Center.

As government employees, and those who work in Government installations, we are keenly aware of our responsibility to this great Nation and its people. We know that

Center forms partnership with historic Tuskegee University

A historic event took place on October 13 when Glenn entered into a Space Act Agreement with Tuskegee University in Tuskegee, AL, to establish a safety and assurance technologies program.

Under the agreement, Glenn will transfer its expertise and provide training to assist Tuskegee University in enhancing its existing safety, health, environmental, and risk management programs.

Glenn and Tuskegee will develop training that will educate the faculty, staff, and students of the university about safety, environmental, and risk management policies and procedures for the university's Office of Environmental Health and Safety. The information can then be transferred to similar programs and other institutions.

The signing took place at the university with participation by Center Director Donald Campbell, Director of Glenn's Safety and Assurance Technologies Directorate Vernon "Bill" Wessel,

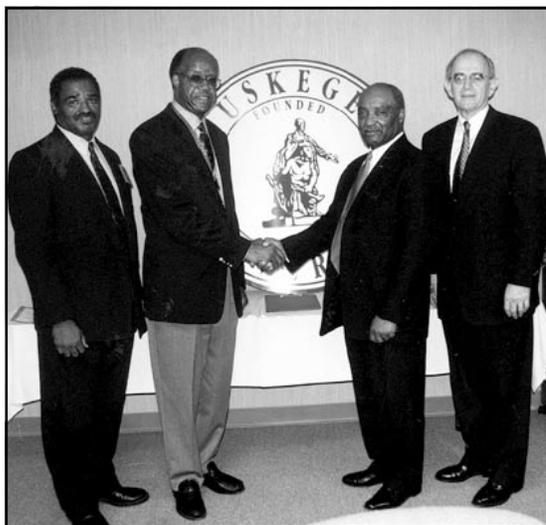


Photo by Linda Duker-Campbell

Left to right, Tuskegee's Jesse Barnes and Dr. Benjamin Payton and Glenn's Donald Campbell and Bill Wessel consummate their partnership after the signing of the Space Act Agreement.

Tuskegee University President Dr. Benjamin Payton, and Director of Tuskegee's Environmental Health and Safety Program Jesse Barnes, Sr. ♦

the principles of dedication, integrity, and service transcend beyond our professional roles into our neighborhoods, schools, and places of worship. We also know that being part of the NASA team comes with high expectations on the part of the American public. Therefore, I applaud our Center's civil servants and support service contractors for living out the spirit of sharing and caring throughout the entire year. ♦

News Notes

SPECIAL CHILDREN'S FUND: Glenn continues its tradition of remembering children with special needs through the Special Children's Fund. Donations can be sent to Carol Stofka at MS 500-320 or Tim Hogan at [redacted]. Please make checks payable to the Glenn Special Children's Fund.

ROAD OPEN: Please note that West 220th Street in Fairview Park is open to traffic.

LESA MEETING: LESA/IFPTE, Local 28, will hold its next monthly membership meeting on Wednesday, December 11, at noon in [redacted].

Exchange Corner

- Olympia candies sale: December 11 and 12 in the Main Cafeteria Alcove from 10 a.m. to 2 p.m. Save 20 percent off the retail store price.
- 20th Annual Appreciation Breakfast buffet: December 24 in the Main Cafeteria from 7 to 9 a.m. Menu includes scrambled eggs, sausage, home fries, fresh fruit, salad, danish, muffins, coffee, and tea at \$3.75 per person.
- Great NASA gift ideas are available at the Exchange Store, Clip the coupon below and save 25 percent on the purchase of a NASA shirt or hat.

25% off any NASA shirt or hat
at
The Exchange Store

Sale items excluded
Coupon expires on December 31, 2002

Infrastructure links humans and robots

BY DOREEN ZUDELL

If you think communicating among fellow humans here on Earth can be challenging, try interacting with humans and robots millions of miles away while attempting to explore a foreign world. Stepping up to this challenge, communications and networking experts from Glenn have designed an innovative communications infrastructure for human-robotic planetary missions.

Glenn researchers were part of a diverse team of several NASA centers, other governmental agencies, and academic institutions who conducted a human-robotic mission simulation in the Arizona desert in September. The interdisciplinary team consisted of communications experts from Glenn and Kennedy Space Center; spacesuit and mission control center experts from Johnson Space Center; robotics experts from Johnson and Ames Research Center; planetary exploration experts from Johnson, Science Applications International Corporation (SAIC), the University of Houston, and Bowling Green State University (BGSU), OH; and geology experts from the University of Texas at El Paso, the University of Cincinnati, OH, BGSU, Wright State University, OH, Stanford University, CA, and the United States Geological Survey at Flagstaff, AZ.



Marc Seibert (5650), center, demonstrates automated instrument control software developed by Cleveland State University to, left to right, Joseph Kosmo (JSC), Dean Eppler (SAIC/JSC), Richard Beck, (University of Cincinnati), and Mike Cauley (5610). The software enables a suited subject to view, take snapshots, and transmit microscopic rock sample images over satellite all in one press of the spacebar on the ruggedized PC.

"Glenn provided local communications between an astronaut, a robot, various scientific instruments, and the base camp, and also connected this remote location to mission control and the world outside the field site," explained Marc Seibert, Communications Technology Division, who served as principal investigator for the Space Communications and Proximity Networks for Human/Robotic Planetary Exploration team. "With the assistance of audio experts from Kennedy, an innovative suit audio system was developed to enable an Extra Vehicular Activity Robotic Assistant rover to understand speech commands with very high reliability from a human in a pressurized spacesuit."

The team exchanged video, voice, and science data between the planetary field site and several "Earth-side" sites. All information was exchanged in Internet protocol format. An innovative, dual-science server replication architecture was tested as well. In this architecture, science data was stored on the "planetary" (field science) server and was synchronized with a mirroring server on the Earthside. Scientists at Glenn, Johnson, and the academic institutions downloaded field science data from the Earth-side server for analysis, review, and comments back to the field team. This architecture minimized the use of the satellite link for file transmission and ensured the science data returned to Earth prior to sharing.

The network connecting the remote site and the Earth-side sites consisted of a Ku-band satellite link between the Arizona desert and Glenn. Once the field data reached Glenn, the video and audio was delayed to simulate Mars communications using a new technology developed for this work called the Planetary-Ohio Network Emulator (p-ONE).

"The biggest 'win' in this demonstration was the big NASA family from various NASA centers and academic institutions who worked together on human-robotic mission concepts," Seibert said. "Each team continues on its own making incremental steps to improve their architectures. Teams will then reconvene to integrate and test more concepts." ♦

Photos by Robert Markowitz, NASA-JSC/IDI



Mike Cauley (5610) configures the Glenn transportable Earth station mobile Ku-band satellite uplink in Meteor Crater, AZ, to connect the remote test site back to Glenn and the Exploration Planning and Operations Center in Houston, TX. Adjacent to the trailer is a Glenn communications van that contains communications equipment to enable transmission of Internet protocol-based video, voice, and data over the satellite link.

Campbell affirms Glenn's role in the Agency

Continued from page 1

Management Program as examples of the Agency's new management style.

Four major trends have emerged over the year that will lead the Agency in a new direction:

- One NASA—move program management back to Headquarters and reshape NASA as the premier research and development Agency
- Increased emphasis on interagency relationships—align with the Departments of Defense, Energy, Commerce, Transportation, and Interior
- Space missions based on science first in new programs—show relevance to mission
- Implementation of President's Management Agenda—improve management practices

Campbell stressed the importance of NASA's vision and mission, which he called "all inclusive" statements that will guide the Agency's activities and research. NASA's strategic plan will be structured like a pyramid with its vision and mission at the top.

"NASA's strategic organization will shift from five stovepipe enterprises that competed with one another to mission-driven research in the areas of space science, Earth science, biological and physical

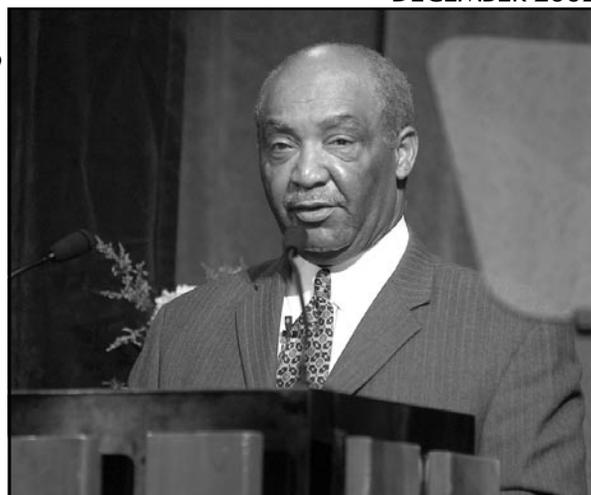
research, and aerospace technology," he explained.

With an aging workforce and a decrease in the Nation's scientific literacy, education has been named a new core competency that will flow into each of the research categories.

"There are 17 locations within the Agency that conduct education," Campbell said. "Headquarters is working to bring them all together to focus on the Agency's educational objectives." He added that Glenn is recognized across the Agency for its education initiatives and that the Center had input in shaping this new organization at the Agency level.

At the Center level, Campbell defined aeropropulsion as Glenn's primary research responsibility, with space propulsion, aerospace power, and communications as additional (not secondary) responsibilities. Microgravity resides in what he called transformational responsibilities because the focus is shifting from hardware to science.

Glenn competencies that reside under the research responsibilities stated above include aeropropulsion systems, fluids and combustion, aerospace communi-



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Photo by Marvin Smith

Center Director Donald Campbell presented the 2002 State of the Center address.

cations, fluid physics, combustion science, bioscience and engineering, and aerospace power and electric propulsion.

"Our competencies support all mission areas," he proudly stated, affirming Glenn's role within the Agency.

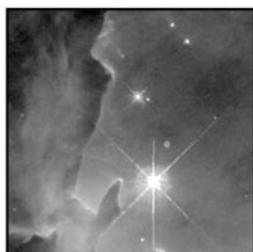
He noted that Glenn is also well postured to transition into an up-front, full-cost budget mode, which all centers will be operating under in 2004.

In summation, Campbell expressed pride in the Glenn workforce, affirming that the Center is posed to play a major role in new Agency programs.

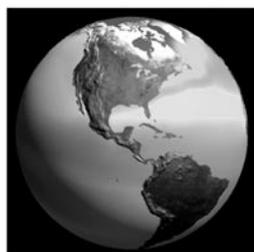
"Long-term projects that employees worked hard on over the years are now finding practical applications, and the Center's base of expertise will support new achievements," he said. ♦

Five Strategic Enterprises One NASA

**Space
Science**



**Earth
Science**



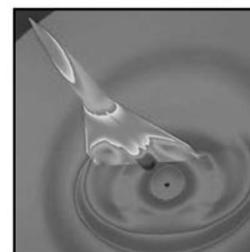
**Biological
and Physical
Research**



**Human
Exploration and
Development
of Space**



**Aerospace
Technology**



Center celebrates safety

BY S. JENISE VERIS

A variety of hands-on activities and displays, all designed to encourage employee participation and awareness of safety procedures, tools, and techniques, were featured during Glenn's Safety Week held October 15 to 21.

Glenn's Safety Office devoted 1 day to a session on fire extinguisher training led by Tom Eakin and Jeff Wagner. Another was on industrial hygiene, conducted by Angela Windau and Betty Hodgson. On Safety Stand Down Day, supervisors and

employees participated in safety discussions and a walk through various areas on Lab. As usual, the Safety Fair drew the largest crowd for the week. This year, in addition to the safety and healthy-living demonstration booths and handouts from local vendors, the Safety Office presented its version of the game show *Wheel of Fortune*.

Because safety and mission success are synonymous at Glenn, Astronaut Dr. Donald Thomas welcomed the opportunity to visit and present Glenn's Safety Awards to the people he described as "the real heroes of the space program."

"I've been with NASA for 15 years—12 as an astronaut with 4 flights," Thomas said. "It's allowed me to gain a unique perspective as the recipient of much of the aviation safety. I have incredible confidence in you people on the ground, knowing that even the smallest element of concern is supported with the same level of seriousness as if critical."

Astronaut Don Thomas (left) autographs photos for Phil Jenkins (5410), Ben Rodriguez and Al Matthews (7240) after the safety award ceremony.



Photo by Eli Abumeri



Photo by Bill Umlouf

Caryn Chalupa (SHS/0400), Daniel Papcke (0540), Aaron Walker (SAIC/0540), and Renee Barrett and Traci Morris (SHS/0400) test their safety knowledge on the *Wheel of Wisdom*.

Thomas joined Manuel Dominiguez, Glenn's Safety Office chief, in presenting the 2002 Safety Awards for Outstanding Support to Safety exhibited by a civil service employee, Gene Pinali (7530); by a division level organization, Test Installation Division; by a support service contractor company, InDyne, Inc.; by a construction contractor company, Precision Environmental, Co.; and by a contractor employee, Mary Minnillo (IDI/0480). Certificates of merit were also presented to nominees in the above categories. ♦

and during lower Earth orbit cycling; second, to compare their behavior to similar batteries being tested at the Jet Propulsion Lab, Air Force Research Lab, and the Naval Research Lab; and finally, to validate this technology for future space missions," explained Concha Reid, test engineer, Electrochemistry Branch.

In preparation for the cycle life test on this flight hardware, a series of tests on Sony 18650 Li-ion cells is already underway. Testing these smaller cells allows dry runs of the actual experiment to be conducted and procedures to be refined where necessary, without putting additional cycles on the actual test battery.

The work is funded under the Aerospace Flight Battery Systems Program, an Agencywide program aimed at ensuring the quality, safety, reliability and performance of flight battery systems for NASA applications. ♦

Cell and battery validation gets a boost

Glenn's ability to support battery development and validation efforts for future NASA missions has been enhanced by recent upgrades to the Electrochemical Cell and Battery Testing Facility. Located in the upgraded laboratory becomes the first test facility at the Center with the capability to perform testing on high-capacity lithium-ion (Li-ion) batteries.

Mars 2001 lithium-ion battery.



These upgrades allow members of the Electrochemistry Branch to cycle and characterize aerospace batteries and cells up to 200 ampere-hours capacity, at controlled temperatures of -40 to 120°C. Glenn can now begin the task of characterizing one of five flight-quality Li-ion batteries that was originally intended for the Mars 2001 mission.

"The purpose of this experiment is threefold: first, to observe the behavior of the batteries while charging, discharging,



Graphic by Terry Condrich

Set and forget: mobile networking

Glenn release

A seamless and secure interoperability of Internet communications among moving vehicles was successfully demonstrated aboard the U.S. Coast Guard's Cutter Neah Bay on November 6. This new technology was the result of a 2-year effort initiated by Glenn.

Glenn worked closely with Cisco Systems, Inc., San Jose, CA, and Western DataCom, Inc., Westlake, OH, under Space Act agreements to



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Photos by Marvin Smith

collaboratively develop the secure mobile networking technology into a new solution that will make access and operation of experiments in space as easy as if they were on Earth and connected to the terrestrial Internet.

The new technology enables communication through an encrypted, mobile network with instantaneous and continuous Internet connectivity. The demonstration featured seamless switching between shore-based and satellite-based Internet connections with transparent router reconfiguration.

Rear Admiral Ronald F. Silva, commander, 9th Coast Guard District, and Glenn

Left to right, Rear Admiral Ronald Silva, US Coast Guard commander, 9th District; Kent Leung, Cisco; and Will Ivancic, Space Communications Office.

Deputy Director Dr. Julian Earls were on hand to introduce the presenters' explanations of the technology.



Cutter Neah Bay

"The importance of this technology lies in its mobility, security, and scalability," said Phil Paulsen, project manager in the Space Communications Office. "These improvements translate into cost savings and increased efficiency, because seamless interoperability between space, air, sea, and ground-based systems leverages the huge investment already made in terrestrial network systems." ♦

Industry reaps rewards of technology transfer

BY S. JENISE VERIS

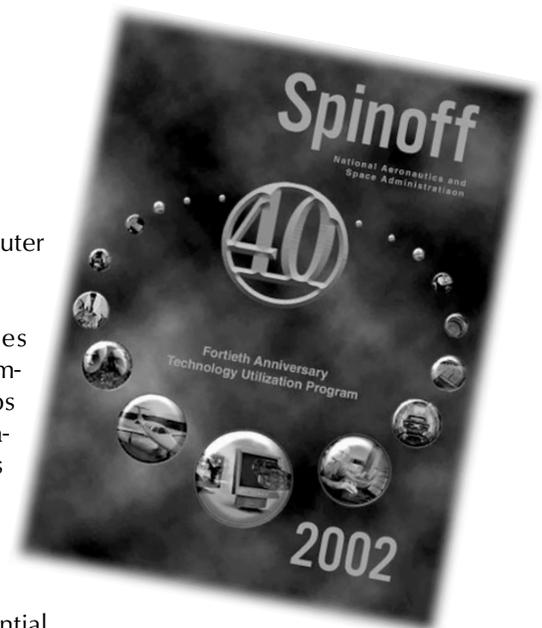
The 40th anniversary edition of *Spinoff* magazine highlights nine Glenn-developed technologies that have been successfully commercialized in the private sector. While Glenn is proud of the specific success stories featured in this edition, it is especially proud of the unique role the Center has played in establishing the Agency's Technology Utilization Program.

The recently released *Spinoff* highlights the historical significance and application of NASA technology successfully commercialized in the private sector. Glenn (then the Lewis Research Center) was the original site of the Technology Utilization Office established in 1963 following a Congressional mandate that created the NASA Space Act of 1958. The act encourages the transfer of aerospace technology for the development of commercial products and services in the fields of health and medicine,

industry, consumer goods, computer technology, and the environment.

Five of nine Glenn technologies featured in this *Spinoff* became competitive products via partnerships created from Small Business Innovation Research projects. NASA is one of 11 agencies participating in this Federal program established to provide a low-risk way for small businesses to develop and commercialize innovations with the potential to enhance or complement Agency research and development activities.

In addition to these great spinoffs, a brief summary on research and development at NASA's Headquarters and its 10 field centers helps demonstrate, through distribution and outreach activities, how NASA technology continues to benefit global competition and the economy. ♦



Editor's note: Domestic requesters can get a free copy of the 40th anniversary issue of *Spinoff* by completing an order form online at http://www.sti.nasa.gov/tto/spin_order_form.html or writing the U.S. Government Printing Office, Superintendent of Documents, Mail Stop SSOP, Washington, DC 20402-9328.

Walz and Bursch visit Glenn

Continued from page 1

launched the Glenn-managed Advanced Communications Technology Satellite, now hold the U.S. first- and second-place records for the most cumulative time in space with 231 and 227 days, respectively.

Throughout the day's events, Walz and Bursch met with members of the Physics of Colloids in Space (PCS), Space Acceleration Measurement System II/Microgravity Acceleration Measurement System, and Electrical Power Systems teams to give feedback on hardware and experiment performance. Michael Doherty, PCS project manager, said that he enjoyed the chance to speak with Walz, who worked on the PCS experiment and had an opportunity to assist in troubleshooting on the system in March prior to the experiment's return.

"We provided a tour of the PCS hardware and gave a briefing on the science results," Doherty said. "The astronauts were happy to see the quantity and quality of data collected and to hear that this data will be beneficial to the principal investigator's study of complex behavior of colloidal suspensions."

During a media briefing, the crew was encouraged to share their most exciting moment on the station. "We were out on an EVA when we discovered a potential flaw in the electrical system," Walz said. "We took the opportunity to fix the problem before it became a larger and more costly one."

The crewmembers also shared exciting, less stressful experiences such as their monthly videoconferences held via satellite with students across the country, including one hosted at Glenn. They especially enjoyed ham radio sessions that allowed them to share their experience with a wider audience and to inspire the underserved in remote areas.

To round out the day, Walz and Bursch added humorous narrative to a presentation of slides and a videotape on their life in space before a packed auditorium of Glenn employees. The following day Walz went solo on a similar presentation for nearly 200 guests, including Walz family members, who came to the Visitor Center. ♦

Thanks, Bill!

A small gesture but a great source of inspiration was the time Walz shared with NASA retiree Bill Crell, a 30-year member of Glenn's Speakers Bureau. Crell was treated to "lunch with an astronaut" in appreciation for conducting more than 350 presentations.

"I'm very honored," Crell said. "Earlier in my NASA career I thought if the opportunity ever presented itself for me to go into space, I wouldn't hesitate; but now I'm content to be a supporter of the space program and to inspire others."

Walz and Crell enjoy lunch.



Photo by David DeFelice

IFMP: teamwork at its best

Continued from page 1

for the most part was a huge success. There have been a number of "bugs" that have required considerable effort at Glenn and Marshall to overcome, although that was not unexpected for a system of this size and complexity.

The Glenn effort required a cross-functional team from finance, resources, procurement, and logistics for successful implementation. "It was a case study in teamwork," said Chief Financial Officer Bob Fails. "This was a long-duration project and people selflessly rebalanced their work and personal lives in a very professional manner, with great enthusiasm and a dose of humor. I am very proud of the leadership that was exhibited at all levels."

The Agencywide utilization of the Core Financial's enterprise software will allow IFMP to deliver full-cost accounting at NASA, a critical concern for both the Administrator and for fulfilling the President's Management Agenda. In addition, improved ability to manage will facilitate the One NASA vision, an effort to work with seamless uniformity across the Agency.

"Agency management was very pleased with the way that we structured and managed the project here at Glenn," Center Director Donald Campbell said. "Deputy CFO Christine Root, who served as project manager, and the entire team have my personal thanks and the gratitude of the Center for the accomplishment." ♦

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 6,700.

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DEADLINES: News items and brief announcements for publication in the January issue must be received by noon, Thursday, December 12. The deadline for the February issue is noon, Friday, January 10. 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 Ideas for news stories are welcome but will be published as space allows.



People

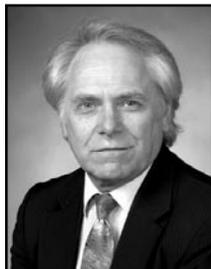
SES appointment

Anita Liang has been appointed chief of the Aeropropulsion Office. She has over 20 years of technical, research, and leadership experience in aeronautics and space. Most recently, Liang was the lead in the planning of an aerospace fuel cell initiative that can lead to an emissionless aircraft while simultaneously revitalizing the Ohio economy. She is known for continually striving for a balanced, diverse, and high-performance workforce and is highly recognized for her open communications.



Liang

The Web sites have been selected for addition to the Association's SciLink database to appear as a textbook reference for related online material. Selection to the database is based on a stringent set of criteria that ensure selected materials have accurate content and effective pedagogy.



Benson



DeFelice

NARFE treasurer

Michael Hoyman, who retired as chief of the Resources Planning and Management Office in 1982 with 25 years of service to NASA and the Government Accounting



Hoyman

Office, has been elected national treasurer of the National Association of Retired Federal Employees (NARFE).

In Memory

Edward Povraznik, 87, who retired from Glenn in 1987 with 28 years of service, recently died. He retired as an electronic systems mechanic.

Harry Nicholson, 79, who retired from Glenn in 1980 with 29 years of service, recently died. He had served as a branch chief in the Test Installations Division.

Curt Liebert, a Glenn retiree who recently died, was incorrectly identified as Carl Liebert in the November *AeroSpace Frontiers* issue.

R&D honor

Bruce Banks and **Sharon Miller**, Electro-Physics Branch, have received the *R&D 100* Editor's award for the Most Innovative New Product in 2002. This is an added acknowledgment of their research in Atomic Oxygen System Art Restoration, which earned an *R&D 100* award in 2002.



Banks



Miller

Web recognition

Web masters **Tom Benson**, Engine Systems Technology Branch, and **David DeFelice**, Community and Media Relations Office, were recently recognized by the National Science Teachers Association for the comprehensive content of their Web sites: <http://www.grc.nasa.gov/WWW/K-12/airplane/atmosi.html>, and <http://www.grc.nasa.gov/WWW/PAO/html/microgex.htm>.

Behind the Badge

a closer look at our colleagues

Toni Niebieszczanski



Job assignment: I'm an InDyne employee who supports the Procurement Division.

Time at Glenn: I've been at Glenn for 19 years.

Hometown: I live on the westside of

Describe your family: I come from a large, diverse, talented, and crazy family. I have 4 sisters and 23 nieces and nephews (one more niece is on the way), plus my dog, Peanut, and 2 cats, Flannel and Domino.

Career alternative: Creative writing

Favorite book or magazine: Steinbeck's *Cannery Row* and the *Bible*

Favorite movie or play: *A Chorus Line*

Activities when away from Glenn: I enjoy cooking, reading, music, gardening, and playing in the sprinkler (we like the swaying fan kind best) with my 4-year-old great niece. Everyone needs a 4-year-old in his/her life to keep your perspective straight.

What do you see as an area of expertise at Glenn: For the past 10 years in Procurement, we've collected new toys during the holidays for the kids at Metro General Hospital. It's a great way to do something nice for kids and to reconnect with the kid in yourself.

Entrepreneurial spirit stimulated at Glenn

BY S. JENISE VERIS

Three small business owners—two Glenn employees and a retiree—who have successfully started their own high tech companies using Glenn technologies offered insight and anecdotes on the process in "Entrepreneurial Revelations." The October 24 gathering kicked off a series of five weekly lunchtime seminars designed to achieve a more entrepreneurial-oriented culture at Glenn.

A few "revelations" commonly shared about navigating business start-up included some tips: Determine your net (cash flow) needs before making any decisions about your employment status. A work order or project can't be counted until you have a signed contract or purchase agreement. Be willing to market your business. Hire someone to do your payroll. Understand the difference between form vs. function because it is the key to knowing when to focus on what for the survival of your business.

The presenters included Dr. Arnon Chait, a part-time materials research engineer in the Microgravity Environment and Telescience Branch and cofounder and president of ANALIZA, Inc., a biotechnology company dedicated to development

of drug discovery and biotech technologies; Dr. Lonnie Reid, former chief of the Internal Fluid Mechanics Division and now founder and president of AP Solutions, Inc., a computational analysis engineering research support group for gas turbine engine technology; and Matt Moran, a mechanical engineer currently on leave without pay from the Thermo-Mechanical Systems Branch to jump-start his new business, Isotherm Technologies, dedicated to the development of cryogenic systems for high-powered lasers, fuel cells, and "super-insulation" applications.

Four subsequent seminars in November dealt with questions including the following: Do I have an innovative idea? How do I protect my idea? How do I get funding? How do I best utilize NASA's technology transfer resources?

Glenn and Enterprise Development, Inc. (EDI), a not-for-profit subsidiary of Case Western Reserve University, hosted the



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Photo by Marvin Smith

Left to right, are Entrepreneurial Revelations panelists Dr. Arnon Chait, Dr. Lonnie Reid, and Matt Moran.

seminars for Glenn employees to encourage a more entrepreneurial approach to the commercialization of NASA technologies. EDI operates the Lewis Incubator for Technology (LIFT), which is co-funded by Glenn and the Ohio Department of Development. Additional support for LIFT is provided by the Great Lakes Industrial Technology Center.

"By holding this series of programs for our employees, we are trying to excite our employees into thinking about commercial applications for the technologies they are developing," said Center Director Donald Campbell. "As a result, we anticipate an increased number of NASA technologies that are successfully utilized in the marketplace, leading to an improved quality of life." ♦

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