

# AEROSPACE

## Frontiers

Volume 8 Issue 2 February 2006

## Dr. Whitlow stresses communicating capabilities

BY DOREEN ZUDELL

"Bringing work to this Center to make it a healthy entity is my major priority," said Dr. Woodrow Whitlow, Jr., during his first All Hands meeting as Glenn's Center Director on January 10.

Communicating the Center's competence is crucial to achieving this goal, he said. "We need to ensure that people are aware of the capabilities we have, and to show programmatic leadership within the Agency that we can do the work."

Deputy Associate Administrator for the Exploration Systems Mission Directorate

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*Left to right: Cooke, Dr. Whitlow, and Christiansen visited the Glenn-fabricated CEV service module mockup on January 10.*



C-2006-115

Photo by Marvin Smith

## Glenn brings CEV concept to life through full-scale model

BY DOREEN ZUDELL

The development of a new spacecraft is key to making NASA's Vision for Space Exploration a reality. Glenn is preparing to help bring that vision to life through design studies of the Crew Exploration Vehicle (CEV) service module. This design was recently fabricated into a full-scale model.

The mock-up—a daunting 18 feet in diameter and weighing just under a ton—was constructed by in-house technicians in the Fabrication Shop and based on detailed engineering designs.

"This impressive model embodies so much of what we do here at Glenn—power, propulsion, and communications—and is a testimonial of the skills and creativity of our engineers and technicians," said Deputy Center Director Rich Christiansen.

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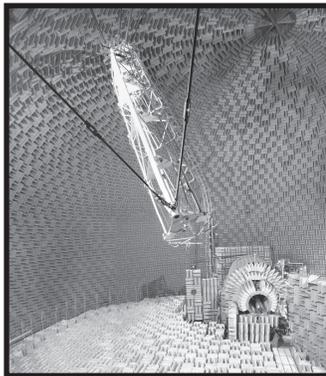
Cable station provides forum for Glenn outreach

# Research Highlights

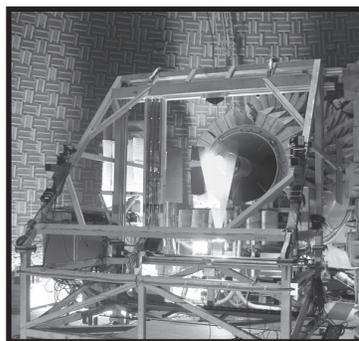
**Fan Trailing Edge Blowing Model:** Results of a recently completed scale model fan test in Glenn's 9- by 15-Foot Low-Speed Wind Tunnel showed potential for significant noise reduction through the application of Fan Trailing Edge Blowing (FTEB). Noise reductions, observed in both tonal and broadband components, were consistent with previous cascade and low-speed fan tests. This model applies the technique to more realistic fan geometry, tip speed, and pressure ratio. The model, designed and built in-house, is designed with internal passages to carry air for injection along the fan trailing edge. The acoustic, aerodynamic, and flow physics data acquired during this test will quantify trailing edge blowing performance and be compared to analytical pre-test predictions. A successful outcome of these tests could mean more work in future noise programs at the Center while enhancing capability of these analytical tools. This work is supported under the Quiet Aircraft Technology Program. Point of contact: Brian Fite, Propulsion Systems Division, 3-3892.



**Jet Exhaust Noise Reduction Concept:** Tests of a new jet exhaust noise reduction concept were recently completed in the Aero-Acoustic Propulsion Laboratory (AAPL). This test, performed with GE Aviation, explores replacing a conventional internal mixer with a chevron mixer aiming to produce the same aerodynamic performance and acoustic performance as lobed mixers, but at a lower cost and weight. Four chevron mixers, combined with a baseline and a chevron nozzle, were tested. In addition to acoustic far-field and phased-array measurements, temperature, pressure, and particle image velocimetry measurements were taken of the jet plume, allowing changes in the turbulent flow field to be correlated with changes in the jet noise. While evaluating the acoustic performance of chevron mixers remains the primary task, the data acquired will also be used to validate NASA computational fluid dynamics and noise prediction codes. This work was supported by the fiscal year 2005 Propulsion 21 Project. Point of contact: James Bridges, Propulsion Systems Division, 3-2896.



**New High Resolution Stereo Particle Imaging Velocimetry (PIV) System:** Glenn recently deployed a new Stereo PIV system that reduces facility testing time by an order of magnitude over previous PIV systems during Offset Stream Technology tests that were performed at the Nozzle Acoustic Test Rig facility. Stereo PIV is an instantaneous, planar velocity measurement technique that uses high-resolution cameras to provide four times the field of view of previous PIV systems. Glenn's advancement in computational software, coupled with state-of-the-art hardware, reduced the data acquisition time by a factor of two over previous systems, reduced the system complexity (single computer instead of two), and reduced the number of operators (from two to one). Langley Research Center loaned the cameras used to support the tests through a cost-sharing agreement that authorizes use of the Glenn-developed PIV software in Langley's Jet Noise Lab. This work is supported under the Quiet Aircraft Technology Program. Point of contact: Dr. Mark Wernet, Instrumentation and Controls Division, 3-3752.



# Planet probing

The adventures of *Stardust*, NASA's comet-hunting probe, came to a successful conclusion on January 15. *Stardust* completed a 2.88-billion mile round-trip odyssey to capture precious samples of comet and interstellar dust particles to Earth.

Launched nearly 7 years ago, on February 7, 1999, *Stardust* encountered comet Wild 2 on January 2, 2004. It flew less than 150 miles from the comet's nucleus to



*Stardust capsule*

capture tiny grains of dust. During the voyage, the spacecraft collected bits of interstellar dust streaming into the solar system from other parts of the galaxy. Scientists believe these precious samples will help provide answers to fundamental questions about comets and the origins of the solar system.

Before the dust settled on one successful mission; however, NASA's attention is already focused on *New Horizons*—literally—a new probe heading to distant Pluto and its moon Charon.

*New Horizons* completes NASA's initial reconnaissance of the planets in the solar system. The compact, 1050-pound piano-sized probe will be the fastest space-



*New Horizons probe*

craft ever launched, reaching lunar orbit distance in just 9 hours and passing Jupiter 13 months later. *New Horizons* launched on January 19 from Cape Can-

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# Cooke joins Dr. Whitlow in All Hands address, tours Center

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(ESMD) Doug Cooke's visit to Glenn that day and participation in the All Hands meeting are important steps toward showcasing Glenn's aptitude.

Prior to the All Hands, Cooke met with Glenn's leadership team and then toured the Power Systems Facility and the Small Multipurpose Research Facility. He also viewed the full-scale Crew Exploration Vehicle (CEV) service module mockup in the Fabrication Shop. During the tours, employees briefed Cooke on previous and current space-related technology and hardware.

Cooke explained that ESMD recently completed a reorganization and is eager to understand the capabilities that exist within the NASA centers. He said that with a vision and architecture in place, the Agency now can move forward in identifying technologies that will accelerate CEV development.

"I'm impressed with the work done here," Cooke said. "I appreciate your hospitality and the opportunity to visit."

Dr. Whitlow affirmed that the Vision for Space Exploration has and will continue to have major impacts on Glenn. "We will pursue work in aeronautics but we will also focus significant efforts on space exploration, space operations, and science."

Much of the question and answer session focused on the topics of jobs and the possibility of a Reduction In Force (RIF) in 2007. Dr. Whitlow stressed the importance of setting long-term strategies that will bring work into the Center, thus alleviating the need for a RIF.

"My primary focus is to bring jobs here," he said, "but it is not going to happen overnight. Long and continued work will lead this Center forward." ♦

C-2006-119



C-2006-118

Photos by Marvin Smith

Top photo: Visitors view the Combustion Integrated Rack (CIR) flight hardware. Pictured, left to right, are Robert Corban, Cooke, Dr. Whitlow, John Snead, and Terry O'Malley.

Bottom photo: Jim Soeder, left, outlines to Cooke and Dr. Whitlow some of the power systems built and integrated in the Power Systems Laboratory.

## Expedition 13 crew selected

NASA and its international partners have selected astronaut Jeffrey Williams and Russian Cosmonaut Pavel Vinogradov as the next crew for the International Space Station, designated as Expedition 13.

Williams will serve as Expedition 13 flight engineer and NASA science officer. He flew aboard the space shuttle *Atlantis* on a 10-day station assembly mission in May of 2000. Vinogradov will command Expedition 13. He spent 198 days on the Russian *Mir* Space Station and performed five spacewalks during a mission in 1997.

Vinogradov and Williams will launch on a Soyuz spacecraft in March from the Baikonur Cosmodrome in Kazakhstan. Accompanying them will be Brazilian Astronaut Marcos Pontes, who will spend 8 days on the station under a contract with Roscosmos, the Russian Federal Space Agency.

The Expedition 13 crew will spend more than a week with their predecessors, Expedition 12 Commander and NASA Science Officer William McArthur and Flight Engineer Valery Tokarev, as they move into their 6-month tour-of-duty that will focus on station assembly preparations, maintenance, and science in microgravity. ♦



Photo courtesy of Gagarin Cosmonaut Training Center

Expedition 13 Commander Vinogradov, left, and Flight Engineer and NASA Science Officer Williams.

## FIRST aims high

The creative juices of nearly 250 Greater Cleveland and Northeast Ohio high school students kicked into gear during the 2006 FIRST (For the Inspiration and Recognition of Science and Technology) Robotics Kickoff held January 7 at Cuyahoga Community College's Unified Technology Center. Like the goals of FIRST, the name and strategy of this year's competition directs students to "Aim High." More than 1100 teams across the nation and six foreign countries attended the kickoff and received materials and guidelines to design, build, and test their robots within a 6-week period. Most of the teams will hone their engineering skills in one of the 33 regional competitions leading up to the national championship in Atlanta at the Georgia Dome in April. Glenn returns as a local sponsor of the sixth annual FIRST Buckeye Regional, scheduled March 9 to 11 at the Cleveland State University Wolstein Center. Pictured are members of Berea High School team gathering their materials for the competition.



Photo by S. Jenise Veris



Photo by Doreen Zudell

## Voinovich staff visit

Staff members of Senator George Voinovich visited Glenn to become better acquainted with the Center and its capabilities on January 12. After a Center overview from Safety and Mission Assurance Director Bill Wessell, the guests toured several facilities to learn about Glenn's research efforts in hypersonics, power and electric propulsion, and fluids and combustion. They also viewed the Crew Exploration Vehicle service module in the Fabrication Shop. Pictured, left to right, are Wessell; Dora Pruce, district director for Senator Voinovich; Gary Smith, director of Government Advocacy for the Greater Cleveland Partnership; Sarah Gainer, legislative assistant to Senator Voinovich; and John Hairston, External Programs director.

## Decommissioning briefing

On January 17, Olga Dominguez, deputy assistant administrator for Infrastructure and Administration at NASA Headquarters, and Keith Peacock, acting Decommissioning Project manager, participated in a public meeting scheduled by Congresswoman Marcy Kaptur. During the meeting, NASA and Kaptur updated her constituents on sampling efforts in connection with low-level contamination found in Plum Brook outside NASA's fence line, which was discovered in association with decommissioning of the Reactor Facility at Plum Brook Station in Sandusky. Kaptur expressed her appreciation for NASA's participation in the meeting. Pictured, left to right, are Peacock, Dominguez, and Kaptur.



Photo by Sally Harrington



*In addition to competing in body-building contests, Sender leads an indoor stationary cycling class.*

## Retiree Spotlight

# Retirement brings Sender unexpected achievements

BY S. JENISE VERIS

After retiring from Glenn over 5 years ago as the Center's Quality Representative, Dennis "Denny" Sender made a quality of life change that he hopes will inspire others who are planning for retirement.

Once he settled into his new home in Ormond Beach, FL, Sender decided to look for a part-time job. "I took a tip from one of the NASA retirement seminars on finding your niche among things you really enjoy doing, but may not be related to your previous career."

Sender's passion for exercise led him to the local Gold's Gym where he soon landed a front desk job and a new lease on life.

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## News Notes

**LESAMEETING:** LESA/IFPTE, Local 28, will hold its next monthly membership meeting on February 8, at noon in the Employee Center, room .

**CORRECTION: LESA/IFPTE LUNCHEON:** The *AeroSpace Frontiers* regrets any inconvenience it caused by publishing the January 13 LESA/IFPTE luncheon as an AFGE event.

**WOMEN'S RETIREE LUNCHEON:** The next luncheon for Glenn female retirees will be Thursday, February 16, at noon, at Dona Schwaben's German American Cultural Center, 7370 Columbia Road, Olmsted Township. For further information, contact Kathleen Webb, 440-845-5286.

**THIRD SATURDAY AT THE VC:** On Saturday, February 18, Glenn's Visitor Center (VC) will present "Back to the Moon" from 10 a.m. to 3 p.m. During the 11 a.m. and 1 p.m. presentations, visitors will learn why NASA is returning to the moon and how we will get there. Hear the answers to these questions and more. Plus, find out about the life of Neil Armstrong, the first person to walk on the moon. Other highlights include free photos available in the Picture Yourself in Space photo booth, kids make and take crafts, and plenty of handouts. For more information and reservations, call

216-433-9653 or logon to [glennevents.grc.nasa.gov](http://glennevents.grc.nasa.gov).

**AFGE MEETING:** AFGE Local 2182 will hold its next monthly membership meeting on March 1, at 5 p.m., at Denny's Restaurant, 25912 Lorain Road, North Olmsted. All members are encouraged to attend.

**CAKE AND COFFEE:** A cake and coffee reception will be held Wednesday, March 15, at 1 p.m., in the Administration Building Auditorium for recent retirees Bill Armstrong, Paul Asmond, Emye Benavage, Tom (John) Bonham, Al Buggele, Dan Chruski, Steve Cuglewski, Dennis Fischbach, Tom Fuller, Tom Lawrence, Steve O'Donnell, Ed Pluta, Dennis Rogers, Roger Scheman, Tim Shaltens, and Bruce Viergutz. All are welcome to bid them farewell. For more information, contact Belinda Seljan, 3-5742, or Lisa Lapka, 3-3004.

**LERCIP PLANNING:** The Educational Programs Office will continue to work with Glenn organizations to host college students this upcoming summer through the Lewis Educational and Research Collaborative Internship Program (LERCIP), which includes the categories of college students, scholars, and teachers. Whether you are a past LERCIP mentor or new to LERCIP, you can start planning now and submit your budgetary request to your

management. Stay tuned to *Today@Glenn* for specific details and dates. For additional information, contact Susan Gott, LERCIP manager, 3-3833.

**DLN VOLUNTEERS NEEDED:** Volunteers are needed to lead videoconferencing presentations to K-16 students through the onsite Digital Learning Network (DLN) studio. These virtual presentations are usually an hour, and can be adjusted around work schedules. Topics include Living in Space, the Solar System, Working for NASA, Aeronautics, and Rockets and Robotics. No travel or previous experience required. For additional information, please logon to <http://nasadln.nmsu.edu/dln>. Contact Theresa Scott, 3-5044, or Theresa.M.Scott@nasa.gov., if interested.

**PBS REUNION SET:** A Plum Brook Station (PBS) Fourth Reunion will be held on Saturday, September 23, at the Engineering Building Cafeteria. All current and former PBS employees, including government and support contractor personnel are invited. A luncheon, program, and facility tours are being planned. The Reunion Committee will soon send out a first notice and needs to update the mailing list. To place your name on the mailing list, contact (in writing) Bill Brown at 3911 James Ave, Huron, OH 44839, or e-mail [huronbill@buckeye-express.com](mailto:huronbill@buckeye-express.com).

# Model is testimonial of skill and creativity

Continued from page 1

The vision for this life-like form began over a year ago when the Center initiated multiple teams within various directorates to develop ideas and concepts on how Glenn could participate in the Vision for Space Exploration. One of those concepts centered on a two-part CEV that would include a command module and a service module. Glenn decided to focus on the service module, which would provide basic power, propulsion, and communications capabilities for journeys to the International Space Station, and then onto the moon, Mars, and beyond.

Concurrently this summer, Christiansen initiated a team with Marshall Space Flight Center to look for ways to work together. They quickly decided to collaborate on a preliminary concept design for service module flight hardware. This design effort transitioned into Glenn's full-scale mockup.

"Contributions from 11 Glenn branches in 4 directorates and an equivalent number of individuals from Marshall, upwards of 40 to 50 folks in all, worked on the study," explained Rick Manella of the Engineering and Technical Services Directorate, who served as technical lead for the study. "A lot of very good engineering came out of this that will help us transition into other areas within the Agency's exploration initiative."

In November, Christiansen approached Dan Gauntner, chief of the Engineering Systems Division (ESD), to create a full-scale mockup of the service module. A team of engineers and technicians immediately got to work to produce the structure in about a month.

Some of these efforts included assistance from the Logistics and Technical Information Division's Publishing Services. "They provided the extra detail needed to create a more realistic model," explained Timothy Roach, mechanical engineering technician, Mechanical Design Branch.

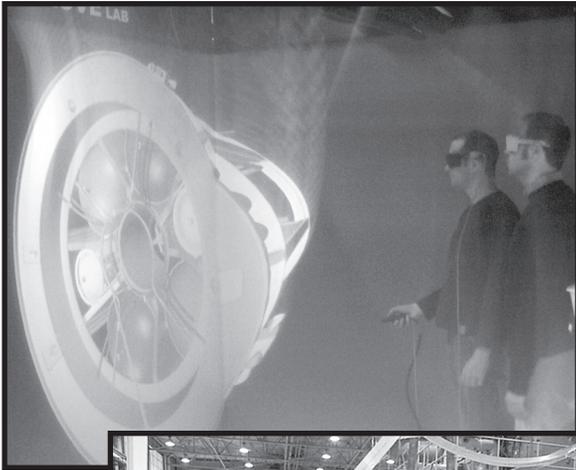
The GRUVE (Glenn Reconfigurable User-interface and Virtual reality Exploration) Laboratory also helped the team to better appreciate the features of the engineering designs through large, interactive displays. This unique laboratory can help designers in updating models and creating presentations for future exploration activities.

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(1) Phil O'Connor, RSIS/Computing Science Division, and Tim Roach view the CEV service module design upclose in the GRUVE Laboratory. (2) Joe Kerka and Brian Edmonds fit a tank frame between support struts on the lower module. (3) Left to right: Ken Ulicny, Walt Wozniak, and Edmonds wrap insulation around the oxygen fuel tank. (4) Bob Hauer works on the mounting base assembly. Unless noted, all employees are members of the Engineering and Technical Services Directorate.

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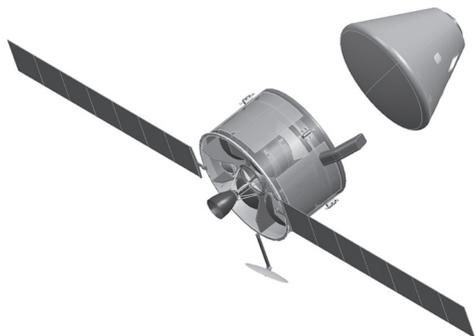


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*The full-scale mockup was based on this CEV service module design created by the Glenn and Marshall team.*

A series of small-scale models, constructed in Glenn's Rapid Prototyping Lab, served as valuable tools in viewing three-dimensional aspects of the proposed mockup. Additionally, some of the hardware modeled in this lab, such as latches and maneuvering thrusters, were placed on the full-scale unit.

"It was exciting to use concurrent engineering on this project from inception on the computer screen, to small-scale models, to the final full-scale version," said Bob Hauer, mechanical engineering technician, Prototype Development Branch.

Gauntner explained that determining the materials to be used to construct the massive model presented a creative and challenging opportunity. "We decided to construct a 180-degree cutaway model so that we could show some of the internal features of the module," he said. "But because of the size of the model, we had to ensure its structural integrity. It was no easy task determining which materials we could use that were durable yet readily available and affordable."

Some of the items utilized by the manufacturing team included aluminum sheeting for the outer and inner skin of the wall, rubber exercise balls used for helium tanks, plywood and masonite to simulate avionics rings, and fiberglass for the engine nozzle. Many items were purchased at local home improvement and hardware stores.

"This was a real team effort where our individual skills cohesively melded

*Left to right: Casey Blaze, Tim Roach, and Scott Cutlip discuss mounting fixtures on the full-scale model in the Fabrication Shop.*



C-2005-1860

Photo by Quentin Schwinn

together to make this project happen within a tight timeframe," explained Joe Kerka, mechanical engineering technician, Materials Technologies Branch.

Christiansen said the benefits of building the mockup have already begun. "We have opened up intraorganizational

communications, tested and improved processes, and proven to ourselves that we have the capability to develop large space systems," he explained. "Our goal is to get this capability into the mainstream of the Agency where the real dividends will come in achieving the exploration mission." ♦

## NASA Glenn Research Center salutes our namesake and American hero John Glenn



# Exercise options abound at Fitness Center

BY DOREEN ZUDELL

Ever feel exercise is boring, difficult, or takes too much time to fit into your busy schedule? Perhaps you just need to know your options.

"Employees may not realize that there are many exercise choices available to them," explained Fitness Center Director Renee Barrett, SHS/Occupational Health Branch. "Our goal at the Fitness Center is to encourage employees to be active whenever it is convenient for them."

Maintaining an exercise schedule, such as a step aerobics class on Monday, Wednesday, and Friday at 11 a.m. or a weight training class on Tuesday and Thursday at 4 p.m., can help integrate fitness into your daily routine, said Barrett. The Fitness Center offers these classes, as well as Yoga, Pilates, kickboxing, and healthy back classes at various times throughout the week. Boot Camp, a challenging program that incorporates team camaraderie and daily encouragement, is growing in popularity as well.

If you find it difficult to exercise at the same time each day, or if you prefer to exercise outside a class setting, the Fit-

ness Center provides an array of cardiovascular and strength training equipment. The staff can set up an individual training routine for you to follow, based on your needs and time limitations.

Weather permitting, employees can utilize the outdoor track, walking paths, and volleyball court. The 1-mile cinder track is adjacent to the Fitness Center, and the walking paths throughout the Center range from .30 to 1.81 miles.

While onsite fitness can be a convenient option for employees, some prefer to exercise in the privacy of their own home or at other fitness facilities. "Don't let the fact that you would rather exercise offsite stop you from utilizing our services," said Barrett. "Our certified fitness experts help a number of employees set up safe and effective fitness routines that they can follow outside of our facility."

In addition to the scheduled classes and fitness equipment, the Fitness Center offers a number of special activities throughout the year such as the Slimathon and Sports Challenge. The annual



Photo by Doreen Zudell

*Barrett, left, helps Brett Bednarczyk, OAI/Materials and Structures Division, set up an exercise routine on an elliptical cross trainer.*

Employee Health and Fitness Day, featuring the Employee Stepout and health exposition, is scheduled for May 17.

For more information about fitness options, contact the Fitness Center at 3-6313 or visit the Web site at <http://ohb.grc.nasa.gov/fitness/activities.htm>. ♦

# Sender stresses a healthy mind and body in retirement years

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Two years later, Sender attended classes and became a certified "spinning" (indoor stationary cycling) instructor. Determined to further increase his knowledge relative to exercise kinesiology, he studied for and passed the International Sports Sciences Association test and became a certified personal trainer.

After spending numerous hours in the gym, he attended a bodybuilding contest in 2003. By May of 2004, Sender competed and placed third in his first competition—the Space Coast Bodybuilding Championship in Melbourne, FL—at the age of 59.

After winning his first medal, Sender caught the bodybuilding bug and pre-

pared to compete in the men's over-60 category in 2005. He went 4-for-4 in 2005—taking first-place in four championships across the state of Florida. An already exciting year got even better when a member of his gym referred him as a guest for a local health-related television program. A fellow trainer also invited Sender to appear on her fitness program that airs on the local PBS station.

With extra time on his hands, retirement has also enabled Sender to give back to his community as a volunteer with the Special Olympics. He has worked with people with mental and physical disabilities who compete in the weightlifting category.

If all goes well and Sender can stay

healthy and injury free, he plans to compete at the bodybuilding nationals that are held in Pittsburgh this year. A win will offer him the opportunity to get his pro card.

"Life after Glenn can be both exciting and fulfilling if you continually set goals and establish retirement plans," Sender affirmed. "In order to get the most out of a healthy, happy retirement you have to keep your body and mind active." ♦

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*AeroSpace Frontiers is looking for retirees to feature in this column. If you or someone you know has an interesting story to tell, call us at 216-433-5317 or 216-433-2888.*

## New tools developed for bioscience

Glenn researchers are making significant strides in developing technologies and techniques that will aid astronauts' ability to withstand an extended presence on the Moon, and ultimately venture to Mars and beyond.

Towards this effort, Glenn is partnering with Physical Sciences, Inc., (PSI) of Andover, MA, under a NASA Small Business Innovation Research Program project called "Low Power, Confocal Imaging of Protein Localization in Living Cells." The collaboration is aimed at creating a compact tool that will study and develop countermeasures for osteoporosis in astronauts living aboard the International Space Station (ISS).

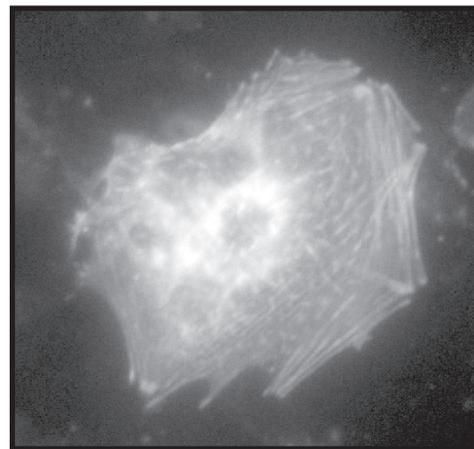
Currently in Phase II, the project unites the Glenn-developed Light Microscopy Module (LMM) computerized microscope with PSI's innovative fluorescent imagery to create a system that is capable of illuminating intracellular changes in osteoblasts. Osteoblasts are human cells responsible for bone growth and repair.

"In the absence of gravity, osteoblasts do not readily rebuild bone tissue," explained, Dr. DeVon Griffin, Human Health and Performance Systems Projects Office, contracting officer for the project. "Astronauts typically lose approximately 1 to 2 percent bone mass per month in the weight-bearing areas of their bodies. If this bone loss were to occur throughout a long-duration spaceflight to Mars, the astronauts would likely return to Earth with a severely damaged skeletal system."

It is expected that this "confocal imaging technology" will improve scientists' understanding of the effects of osteoporosis as it occurs in astronauts at accelerated rates. Fluorescent agents are added to a line of bone cells to enable researchers to monitor cellular activity and protein interaction. When a laser beam of light is sent to the bone cell, the fluorescent agent within the cell absorbs the light and re-emits the light in a different color.

Under Glenn's management, PSI has procured the compact laser and successfully established a stable cell line using DNA from protein fusion. They have been photographing and analyzing images of the cell activity after manipulating the genetic structures. PSI is also working on integrating and testing a second laser to be added to the imaging system.

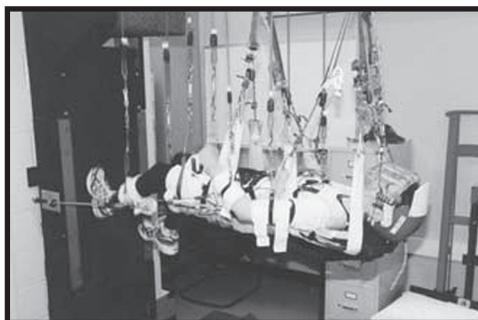
As this research continues, the increased knowledge of bone cell activity will result in more efficient countermeasures to protect astronaut health and may even help medical researchers prevent osteoporosis in those living on Earth. ♦



*Pictured are rat osteosarcoma cells injected with red fusion proteins.*

*This article was submitted by Emily Grob, ANLX, Exploration Systems Division.*

## NASA studies bone loss with floating treadmill



*eZLS testing with humans begins this spring.*

(eZLS), is part of Glenn's new Exercise Countermeasures Laboratory (ECL), located in Building 110. The eZLS mounts vertically in a free-standing frame, and a suspension system supports a runner under the head, torso, arms, and legs, such as they are oriented in a horizontal, or spine, position. In this orientation, there is no gravitational force between the runner and the machine.

The treadmill on the International Space Station (ISS) is detached and floats inside the vehicle. This lightens the load to the space station and reduces vibrations that might disturb other experiments. As a result, the treadmill moves a bit with the runner, which may impact the amount of exercise an astronaut needs to stay healthy.

To reproduce the floating effect, Glenn engineers added air bearings to the bottom of the treadmill. These devices, which look like hockey pucks, have tiny holes that emit a thin film of air, causing the machine to float much like the puck on an air hockey table. This hovering exercise machine can be made to simulate the "compliance" in the other exercise devices on the ISS as well.

This spring, Glenn will begin testing in the ECL using human participants. The information gathered will help NASA design better exercise equipment and develop exercise routines for astronauts to help keep their bodies fit and their bones strong. For more information on this research effort, visit <http://www.nasa.gov/missionpages/station/science/eZLS treadmill 01036.html>. ♦

## People

### Awards and Honors

Carlos Morrison and Eric Clark will be among this year's list of accomplished engineers and technologists honored at the 20<sup>th</sup> Annual Black Engineer of the Year Awards (BEYA) Conference, to be held February 16 to 18 in Baltimore, MD. Morrison, physicist-aerospace engineer in the Structural Mechanics and Dynamics Branch, is an Outstanding Technical Contribution in Government award winner. Clark, an electrical engineer in the Photovoltaic and Space Environments Branch, is a Modern Day Technology Leader award winner. The BEYA conference is produced by Career Communications Group, Inc., publishers of *US Black Engineer & IT* magazine. More information on the winners is available at [www.ccgmag.com](http://www.ccgmag.com).



Clark



Morrison



de Groh

Kim de Groh, Electro-Physics Branch, was selected to receive the 2006 Society of Automotive Engineers' (SAE) J. Cordell Breed Award for Women Leaders. The award was established in 1999 by the SAE Women Engineers Committee to recognize the role of women in the mobility industry by the contributions they make both professionally and personally. The award will be presented during the Honors Convocation of the SAE World Congress at the Cobo Center in Detroit on April 4.

### Patent



Dr. Landis

U.S. Patent 6,967,462, "Charging of Devices by Microwave Power Beaming," was issued to Dr. Geoffrey Landis, Photovoltaic and Space Environments Branch. This invention is a spinoff of NASA Glenn research on use of microwaves for beaming power in space. Landis proposed using the technologies developed for powering spacecraft for charging consumer electronics such as cell phones, personal digital assistants, or laptop computers. Landis currently serves as the Ronald E. McNair-NASA Visiting Professor of Astronautics at the Massachusetts Institute of Technology where he teaches a course on spacecraft design.

### In Appreciation

I sincerely appreciate all the cards, words, prayers, and thoughts from my many coworkers following the death of my husband, Leon. Your kindnesses helped support me during this difficult time. Your thoughtfulness will be fondly remembered.

—Sandy App

### In Memory

John Brasty, 74, who retired in 1988, after 32 years of NASA service, recently died. Brasty served 4 years in the military prior to his NASA career as an equipment specialist in the Logistics Management Division.

Thomas Jentner, 81, who retired in 1988, after 26 years of NASA service, recently died. Jentner served 10 years in the military prior to his NASA career as an electrical engineer in the Electronic and Control Systems Division.

## Retirements

November 26, 2005

Monetta Moffitt, Systems Analysis Division, retired with 20 ½ years of NASA service.

December 31, 2005

Samuel Alterovitz, Communications Division, retired with 22 years of NASA service.

Gloria O'Donnell, Materials and Structures Division, retired with 41 years of NASA service.

Dennis Fishbach, Research Testing Division, retired with 43 ½ years of NASA service.

Jesse Hall, Resources Analysis and Management Division, retired with 17 years of Federal service, including 13 with NASA.

Thomas Lawrence, Research Testing Division, retired with 23 ½ years of Federal service, including 21 ½ with NASA.

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DEADLINES: News items and brief announcements for publication in the March issue must be received by noon, February 10. The deadline for the April issue is noon, March 17. Submit contributions to the editor via e-mail, [doreen.zudell@grc.nasa.gov](mailto: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>.



# Retirements

Continued from page 10

Christopher Rognon, Facilities Division, retired with 35 ½ years of Federal service, including 32 ½ with NASA.

January 3, 2006

Alvin Buggele, Research Testing Division, retired with 41 ½ years of NASA service.

Dorothy "Dot" Carney, Computing Science Division, retired with 22 years of NASA service.

Daniel Chrulski, Research Testing Division, retired with 39 years of NASA service.

Linda Cognata, Safety, Health and Environmental Division, retired with 35 years of Federal service, including 26 ½ with NASA.

Stephen Cuglewski, Research Testing Division, retired with 30 years of Federal service, including 26 years with NASA.

John Gaff, Office of the Director, retired with 38 ½ years of NASA service.

Annie Hayes, Procurement Division, retired with 16 ½ years of NASA service.

Martin Jacob, Resources Analysis and Management Office, retired with 35 ½ years of Federal service, including 21 ½ with NASA.

Robert Kozar, Engineering and Technical Services Directorate, retired with 35 years of NASA service.

Linda Little, Educational Programs Office, retired with 32 years of Federal service, including 29 ½ with NASA.

Walter Merrill, Research and Technology Directorate, retired with 30 years of NASA service.

Richard Neubauer, Financial Management Division, retired with 35 ½ years of Federal service, including 17 ½ with NASA.

Steven O'Donnell, Research Testing Division, retired with 33 years of Federal service, including 11 with NASA.

Debra Ann Rak, Procurement Division, retired with 31 years of Federal service, including 25 with NASA.

Roger Scheman, Research Testing Division, retired with 38 ½ years of NASA service.

Gene Schwarze, Power and Electric Propulsion Division, retired with 46 years of Federal service, including 42 with NASA.

Timothy Shaltens, Research Testing Division, retired with 32 years of Federal service, including 25 with NASA.

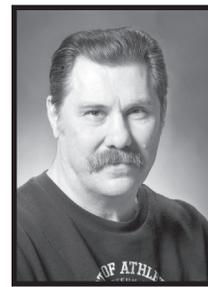
Sonia Shriver, Procurement Division, retired with 28 ½ years of Federal service, including 26 with NASA.

James Stachiw, Computing Science Division, retired with 34 ½ years of Federal service, including 28 ½ with NASA.

Theresa Zarrelli, Science Division, retired with 29 years of NASA service.



*Carney*



*Cuglewski*



*Gaff*



*Hayes*



*Kozar*



*Merrill*



*Zarrelli*



*O'Donnell*



*Buggele*



*Schwarze*



*Stachiw*



*Shriver*

# Local cable station provides forum for outreach

BY DOREEN ZUDELL

Move over "Dateline." Berea City Schools (BCS) "A Community of Learning" cable television program is going strong—with employees from NASA Glenn headlining the guest list.

BCS's "A Community of Learning" is a weekly, student-run talk show that provides them hands-on experience in all aspects of television production while offering residents of Berea, Brook Park, and Middleburg Heights news with a local flavor. Along with school district highlights, the show features guests from local organizations such as Glenn, Baldwin-Wallace College, Polaris Career Center, Cleveland Metroparks, and South-west General Health Center.

"We enjoy having NASA Glenn employees on our show," said BCS Director of Community Relations and BCS-TV Producer Nancy Braford. "Since 1998 Glenn has been providing outstanding guests who share information about NASA that is interesting, informative, and timely."

Glenn's News Chief, Lori Rachul, Community and Media Relations Office (CMRO), works with her staff to identify topics of interest and employees who have the knowledge and desire to share

information in a television interview format. Through the years, CMRO has coordinated guest appearances covering such topics as the Mars Rover, Breakthrough Propulsion Physics, Digital Learning Network, and more recently, Glenn's Return to Flight efforts.

"The show provides us with an avenue to reach more people and tell them what we do at Glenn," said Rachul. "It also strengthens our partnership with the local community."

BCS-TV students (middle school and high school students) meet after school to tape the shows biweekly during the school year (September through May). Each show features three guests in 9-minute segments, plus short features of school and community activities. Prior to taping, a Glenn public affairs specialist works with employees to help them prepare for the interview. A Glenn guest usually goes to the station once a month for taping. Shows are recorded and played 2 weeks later several times dur-

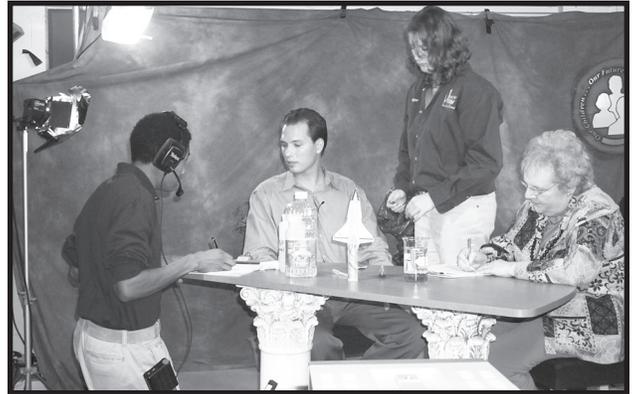


Photo by Sallie Keith

*Pictured, left to right, Terence Anderson, BCS student; guest Dr. Michael Lienbard, Sensors and Electronics Branch; Nicki Adkins, BCS student; and Rhonda Rosen, host; prepare for a taping of "A Community of Learning."*

ing the week. Shows can be viewed on Adelphia, Channel 22, and Wide Open West, Channel 18, networks for homes in the BCS district.

"We appreciate the willingness of NASA employees to share their time and expertise with us," Braford said. "The viewers on BCS-TV and students have learned a lot about Glenn from the many fascinating Glenn guests who have appeared on our programs. Glenn has been a big part of our success." ♦

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