



Glenn Offers Flexible Flight Research Capability

Glenn Aircraft Operations is offering customers an opportunity to easily transition their technology from the laboratory to an actual flight environment aboard NASA's S-3B Viking aircraft. Cargo pods, previously designed by the U.S. Navy for the aircraft carrier's logistical support, were modified into Highly Adaptable Multi-Mission Experimental Research (HAMMER) pods for use as a flexible research platform.

The S-3B Viking aircraft is a highly modified version of the Lockheed Martin S-3B aircraft that the Navy decommissioned after 30 years of service. Glenn transformed it from a carrier-based military aircraft to a state-of-the-art research aircraft capable of a wide variety of science and aeronautics missions.

The pod configuration allows for hardware integration and testing to be performed on the ground, thus decreasing aircraft-related tests and scheduling costs. Glenn's HAMMER pod can carry a maximum weight of 1,025 pounds of cargo. The existing standard aircraft cargo rails are used to mount internal research equipment, however, standard 19-inch equipment racks are also available for mounting research hardware inside the pods. Side and nadir port windows can be customized for each research mission.

"The large volume and payload capacity make the HAMMER pod ideal for testing lower technology readiness level (TRL) hardware that has not yet been optimized for flight in terms of size and weight," said Alan Micklewright, chief,

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Photo by Jeff Polack

One of two Highly Adaptable Multi-Mission Experimental Research (HAMMER) pods available for use as a research platform aboard NASA's S-3B aircraft.

Human Factor Focus of Safety and Health Day

NASA Glenn held its annual Safety and Health Awareness Day, June 22, in conjunction with the National Safety Counsel's Safety Month. The theme—SafeForLife—stressed the importance of the human factor of safety in all areas of our daily lives. Safety and Mission Assurance Director Anita Liang and staff offered an impressive line up of speakers, workshops, informa-

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Glenn Hangar Gets a Makeover



GRC-2016-C-05429

Photo by Bridget Caswell

NASA Glenn's hangar at Lewis Field recently received a new look. The center replaced the worn and faded NASA letters on the hangar roof with the more recognizable NASA logo, also known as the "meatball."

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Two Important Safety Reminders

Our center's policies on traffic and smoking—consistent with State of Ohio regulations and Federal Executive Orders—are in place to assure the safety and health of everyone at Lewis Field and Plum Brook Station. Speed limits are set to keep drivers and pedestrians safe. Designated smoking areas and receptacles are positioned to reduce exposure to smoke and safely collect cigarettes. In the last several months, our Security Office has issued citations for speeding and texting while driving. In addition, cigarette butts have been found near flammable materials, and multiple fires have broken out in dumpsters due to improper disposal of cigarettes. I ask that everyone be aware of our center policies to avoid these types of hazards and keep us out of harm's way.

Each one of us has the responsibility to keep our center and each other safe.
—Janet

Research Capability

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Aircraft Operations Office. "All experiments using Glenn pods are subject to a safety and airworthiness review process prior to approval for flight."

Research personnel who plan to fly on the S-3B Viking with their experiments must be in good health and provide certification of both a current flight physical and record of attendance at either a military or Federal Aviation Administration passenger/aircrew physiological training course. Glenn Aircraft Operations will work with personnel to ensure training and qualification requirements are tailored to specific projects and provide assistance in meeting requirements, if needed.

For more information, contact Micklewright, 216-433-2036, or Jeffrey Polack, 216-433-3013.

Center Signs Agreements, Recognizes First Startup License

NASA Glenn's Technology Transfer Office (TTO) hosted a ceremony to commemorate the signing of two commercial licenses and to celebrate the center's first startup license during Glenn's Technology Day in May.

Commercial Licenses

Glenn signed two new commercial license agreements for its state-of-the-art, highly flexible and durable polyimide and polyamide aerogel with Aerogel Technologies, LLC of Boston, Massachusetts. The company plans to manufacture and market the organic materials to the engineering materials, aviation and automotive industries. An attractive feature of aerogels is that they can be manufactured on a per-piece basis, for greater efficiency and accessibility to a broader audience.

The technology was invented and developed by Dr. Mary Ann Meador, Stephanie Vivod and Dr. Rocco Viggiano of Glenn; Dr. Heidi Guo and Dr. Baochau Nguyen with Ohio Aerospace Institute; and Dr. Jarrod Williams, a former NASA postdoctoral fellow.



GRC-2016-C-03310

Team for the AirFlare LLC license for the Portable Unit for Metabolic Analysis (PUMA) include: Front row: Daniel Lawbon (AirFlare), Janet Watkins; back row: Dave Petrarca, Dave Urban, Ankil Jain (AirFlare), Priscilla Diem, Russell Valentine, Kim Dalglish-Miller, Mike Lichter, Dan Dietrich, Amy Hiltabidel and Jeff Juergens. Not pictured: Dale Diedrick, Mike Lewis, Pete Struk, Rick Pettegrew, Mark Lewis, Marsba Nall and DeVon Griffin.



GRC-2016-C-03314

Photos by Marvin Smith

Team for the Aerogel Technologies, LLC licenses for the polyimide and polyamide aerogel: Front row: Dr. Stephen Steiner, Janet Watkins; back row: Bob Draper, Baochau Nguyen, Stephanie Vivod, Priscilla Diem, Mary Ann Meador, Rocco Viggiano, Justin Griffin, Ryan Nelson, Heidi Guo, Vadim Lvovich, Kim Dalglish-Miller and Amy Hiltabidel.

For more information, visit <http://technology.grc.nasa.gov/featurestory/tech-day-commercial-licenses>.

Startup License

To commemorate Glenn's first commercial startup license, TTO held an official

proclamation signing ceremony with AirFlare LLC of Nashville, Tennessee. Startup NASA is a new opportunity offered by NASA's TTO. Startup companies can apply to license patented NASA technology with no up-front payment.

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Call for Mentors and Tutors

Five Opportunities to Boost Students' Success

Glenn's Office of Education (OE) is partnering with several organizations in Cleveland to provide mentors and tutors for students who need extra help and encouragement to attain their full potential. Each of these programs is a little different in how they work and the time commitment required. With the exception of Federal Executive Board (FEB) tutoring, which is only available to federal employees, the other programs are available to Glenn civil servants, support service contractors and retirees.

Here are five ways you can help "boost students' success":

1 ONE

The Federal Executive Board (FEB) offers students in K-8 at several Cleveland Metropolitan School District (CMSD) schools tutoring in the areas of science, math, reading or writing. Volunteers are needed for one-on-one tutoring for a minimum of 4 hours a month.

2 TWO

Metropolitan Cleveland Consortium for Science, Technology, Engineering, and Mathematics (MC2 STEM) High School provides tutoring at the Great Lakes Science Center. This could be accomplished in one of three ways—Individual, Group (three to four students) or Classroom (tutors assist teachers in answering questions or providing aid). The minimum time commitment is 1 hour per week over a 3-month period.



Photo by Caleb Fisher

Caleb Fisher, Fluid and Cryogenic Systems Branch, takes a selfie with third graders at Clark Elementary School, under the FEB tutoring program. Fisher has been tutoring in the Cleveland City Schools for the past 11 years.

3 THREE

College Now Greater Cleveland provides Cleveland area students with college advising, financial aid counseling and scholarships. Mentoring is performed primarily online with a few face-to-face meetings throughout the year. Mentors commit to a 4-year relationship with a student, in which you exchange messages twice per month and meet in person three times per year.

4 FOUR

Big Brothers Big Sisters of Greater Cleveland provides one mentor per four students and uses an established curriculum to teach social and emotional skills development, problem solving, goal setting and other skills for students in the Richmond Heights School District. The time commitment is 4 hours per month.

5 FIVE

True2U is a mentoring and career awareness program that prepares CMSD eighth-grade students to transition from middle school to high school. Formal curriculum embraces technology and career exposure. Mentors partner with another mentor, the lead teacher and 10 students, 1 day per month for 3 hours in the morning during the school day over the 9-month school year.

The 2016-2017 school year begins soon, so please contact William "Tim" Dedula, 216-433-3668, for more information on these programs. Stay tuned to *Today@Glenn* for details on an upcoming website that provides complete details on OE's full range of mentoring and tutoring programs.

By Tim Dedula and Doreen B. Zudell

Transfer Technology

Continued from page 2

They can also choose from a diverse portfolio of more than 1,200 NASA technologies that range from materials and coatings to robotics as the basis for new products and services.

AirFlare plans to commercialize Glenn's patent-pending Portable Unit for Metabolic Analysis, or PUMA, for the fitness

market. AirFlare intends to create a wearable device that will allow elite athletes and dieters access to laboratory-grade information to quantify their fitness level and help them fine tune their routines.

Glenn's Dr. Daniel Dietrich led a team of engineers that initially devel-

oped PUMA, a lightweight monitoring system designed to monitor the oxygen consumption and carbon dioxide production rates of astronauts exercising during long missions.

For more information, visit <http://technology.grc.nasa.gov/featurestory/airflare>.

Strategizing for Future Collaborations



GRC-2016-C-04838

Photo by Marvin Smith

NASA Glenn hosted the first Ohio General Assembly's Ohio Aerospace and Aviation Technology Committee (OAATC) Field Meeting, chaired by State Representative Rick Perales, June 23. Dr. Janet Kavandi (pictured) was one of the panelists who provided remarks on the aerospace/aviation resources, operations and expertise available in Northeast Ohio to OAATC members and guests. A working lunch centered on future collaborations and strategies to enhance and grow Ohio's aerospace/aviation industry. Attendees also toured several Lewis Field facilities.

Respecting Civil Rights for All

In recognition of Lesbian, Gay, Bisexual and Transgender (LGBT) Pride Month, Glenn's Rainbow Alliance Advisory Group held its second annual Open House and Brown Bag Lunch, June 28. Keynote Speaker, David Chambers, senior civil rights analyst at NASA Headquarters, discussed the importance of civil rights for all employees and processes in place to address issues relating to equal opportunity in the workplace. Glenn's Rainbow Alliance assists and advises Glenn's Office of Diversity and Equal Opportunity and center management in promoting a safe and inclusive work environment, free from discrimination and harassment, regardless of sexual orientation or gender. Pictured: Chambers, front, right, joins members of Glenn's Rainbow Alliance Advisory Group in supporting civil rights.



GRC-2016-C-04645

Photo by Marvin Smith



GRC-2016-C-04937

Photo by Rami Daud

Glenn Showcases Competencies to Interns, Fellows

NASA Glenn's Office of Education hosted a summer Career Showcase in the MIC, June 30. Glenn organizations displayed their work in support of center core competencies, talked about various NASA missions and provided career information to summer program participants. Five contractor and 9 NASA organizations provided 24 tabletop displays to support approximately 220 interns, faculty fellows and Pathway students.

Employees Show CAVS Spirit

On the heels of our successful 75th Anniversary open houses at Lewis Field and Plum Brook Station, Glenn staff exhibited excitement and pride in the success of our hometown Cleveland Cavaliers. On the same day the city of Cleveland honored the 2016 NBA Champion Cleveland Cavaliers with a parade and rally, many employees wore their favorite Cavaliers gear—or wine and gold colors—to work. Pictured: A few employees gather to show their Cleveland Cavaliers pride.



GRC-2016-C-04708

Photo by Rami Daud

Celebrating a 75-Year Legacy

This is the seventh and final article in a monthly series of historical highlights commemorating Glenn's 75th anniversary and extraordinary technical accomplishments that reach across 7 decades.



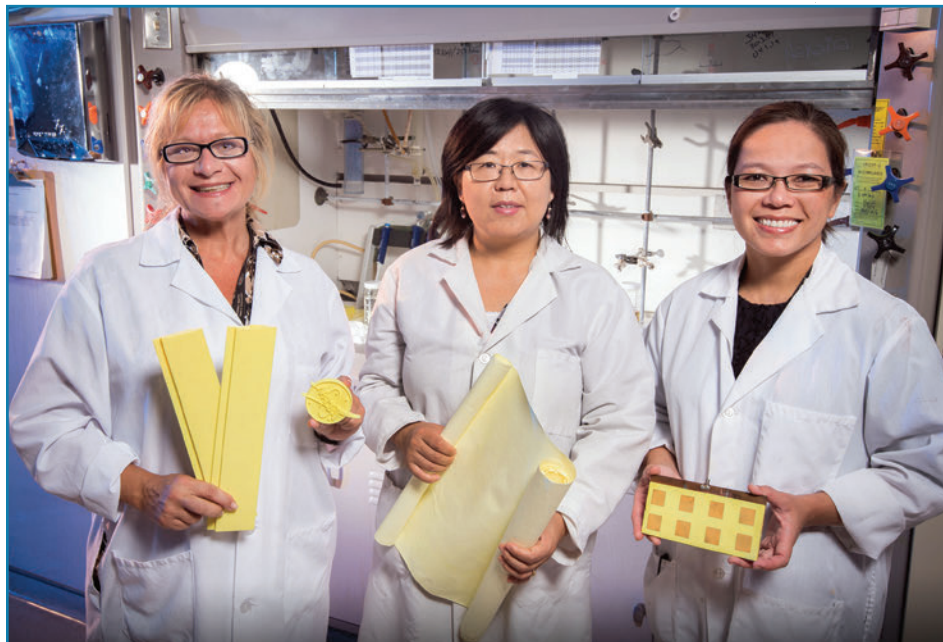
Looking Back: 2000s

Throughout the 2000 decade, NASA Glenn researchers made several breakthroughs in the creation of aerogels. The foam-like substance is the lightest weighing solid in existence and has exceptional insulating characteristics. Aerogels have a number of applications on Earth and in space.

The aerogel studies merge two of the center's legacy areas of research—materials and insulation systems. Glenn researchers have worked to develop materials that are stronger, lighter and more resistant to high temperatures since the 1940s. These new materials, which include steel alloys, ceramics and composite materials, were created primarily to improve turbomachinery for aircraft engines, but have been applied to other fields.

Engineers were quick to use aerogels, which emerged in the 1930s, as an insulating material. The porous solid is created by mixing a polymer with a solvent such as silica, extracting the liquid from it, and replacing it with air. The result is a porous, lightweight solid with excellent thermal properties. These lightweight materials, however, were fragile.

Glenn recently devised ways to manufacture new varieties of aerogels.



GRC-2015-C-05460

Photos by Bridget Caswell

Left to right: Stephanie Vivod, Dr. Haiquan Guo (OAI), and Dr. Baochau Nguyen, from Glenn's Materials, Chemistry and Physics Branch, Materials and Structures Division, display several forms that a polyimide aerogel might take depending on its application. Vivod holds aerogel parts molded as shiplap. Guo holds a roll of aerogel thin film. Nguyen holds an aerogel antenna.

This includes reinforcing silica aerogels with polymers to strengthen the fragile material, and also to create polymer aerogels that are stronger and more flexible. Possible applications for these aerogels are temporary shelters, clothing, refrigeration and cryogenic storage.

As NASA contemplates extended human missions to Mars and other

planets, long-term storage of cryogenics fluids used as propellant for rocket engines is a major issue. Glenn research focused on aerogels as insulation may contribute to future advancements that prevent extremely cold liquids from evaporating during a mission.

Courtesy of NASA Glenn History Office

Awards

Cleveland's NTA Recognizes Two Glenn Employees

The Cleveland Chapter of the National Technical Association (NTA) honored Glenn's Dr. Jerry Lang and Brandon White during the 14th annual Technical Symposium and Awards banquet at Ohio Aerospace Institute (OAI), June 3. Former Center Director Dr. Woodrow Whitlow Jr. delivered the keynote address.

Dr. Bilal Bomani, Fluid Physics and Transport Processes Branch, NTA Cleveland vice president and Technical Symposium chairman, presented the awards to Glenn honorees.

Lang, a materials research engineer, Ceramic and Polymer Composites Branch, received the Nsoroma Lifetime Achievement Award. He is cited for contributions during a 35-year-plus NASA career in research and development and over 20 years of support to NTA programs for underrepresented men and women in the STEM fields. White, an electrical engineer, Power Management and Distribution Branch, received the Nsoroma Prince Award. He is recognized as a "rising star" for contributions to advance NASA's Solar



Left: White gives his acceptance speech. Right: Dr. Lang accepts his award from Cleveland's NTA Vice President Dr. Bomani.

Photos courtesy of NTA Cleveland

Electric Propulsion technology and mentoring in NTA STEM and robotics programs.

By S. Jenise Veris

R & E Directorate Recognizes Talented Workforce

Glenn's Research and Engineering Director Dr. Rickey Shyne and Associate Director Maria Babula presided over a special awards ceremony, June 20, in the Administration Building Auditorium. The event was a celebration of several individual and team awards achieved across the Directorate over the past year.

Certificates of appreciation were presented commending the following achievements:

- Aviation Week's 2016 Laureate Award in Technology to NASA's Environmentally Responsible Aviation (ERA) Project Team.
- NASA's Office of the Chief Engineer's 2015 Systems Engineering Technical Excellence Award (Program/Project Category) presented to the Spacecraft Fire Safety Demonstration (SFSD) project, SAFFIRE, systems engineering team.
- NASA's Space Flight Awareness (SFA) Management Award to David J. Hoffman.
- NASA's SFA Trailblazer Award to James P. Winkel.
- NASA's SFA Team Award to the Orion eSTA Building Block Modal Test Team. (Photo unavailable)

- Two awards, previously announced in the *AeroSpace Frontiers*, were the Presidential Early Career Award to Vikram Shyam (see April 2016, p. 6) and the Rotary National Award for Space Achievement (RNASA) Stellar Award to Dr. Geoff Landis (see June 2016, p. 6).



GRC-2016-C-04759

Glenn members of the NASA Environmentally Responsible Aviation (ERA) Project Team.



GRC-2016-C-04764

Photos by Marvin Smith

Dr. Shyne, left, presents SFA Management Award to David Hoffman.



GRC-2016-C-04766

Dr. Shyne, left, presents the SFA Trailblazer Award to James Winkel.



GRC-2016-C-04763

Spacecraft Fire Safety Demonstration (SFSD) project, SAFFIRE, Systems Engineering Team.

Retirements



Rachul

Lori Rachul, Office of Communications & External Relations, retired on Aug. 1, 2016, with 37 years of service.

In Appreciation

Many thanks to all who attended my retirement party. Thank you also for the framed gold foil of NASA Glenn Research Center. It's a nice remembrance of my years with NASA and a keepsake to treasure. —Kay DeWillie

Promotions



Scheidegger

Robert Scheidegger has been named chief of the Power Management and Distribution Branch in the Power Division of the Research and Engineering Directorate, effective June 12. Scheidegger previously served as the Power lead for the Asteroid Redirect Robotic Mission. He now leads an organization that provides engineering for power management and distribution research, development, design, test and evaluation for use in space, aeronautical and terrestrial electric power systems applications. The organization is responsible for developing modular and autonomous power systems, power processing and hybrid electric power.

tion for use in space, aeronautical and terrestrial electric power systems applications. The organization is responsible for developing modular and autonomous power systems, power processing and hybrid electric power.

Agency Honor and Center Awards Ceremony

August 31, 2016

10:30 a.m. to 12:00 p.m.

Mission Integration Center Auditorium

Welcome to the NASA Family

Glenn welcomed 11 new employees who reported for orientation on April 18, 2016. They include Waldo Acosta, Aviation Environments Test Engineering Branch; Darren Benn, Structural Dynamics Branch; Yue Bruckner, Facility Project Management Branch; Thomas DeMichael, Manufacturing Engineering & Process Branch; Jason Keister, Planning and Integration Office; Jonathan Mackey, Electric Propulsion Systems Branch; Tysen Mulder, Rotating and Drive Systems Branch; J. Michael Newman, Propulsion Systems Analysis Branch; Evan Racine, Thermal Systems Branch; Lisa Ramsey, Energy and Environmental Management Office; and Seth Spiegel, Inlets and Nozzles Branch.



GRC-2016-C-03808

Photos by Bridget Caswell

Pictured, left to right, front: Bruckner, Acosta, Ramsey, Mulder and Mackey. Back, left to right: DeMichael, Benn, Newman, Racine, Spiegel and Keister.

Emergency and Inclement Weather Lines

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

Glenn welcomed seven new employees who reported for orientation on May 2. They include Amy Hiltabidel, Technology Transfer Office; Ian Jakupca, Photovoltaic and Electrochemical Systems Branch; Marla Kennedy, Workforce Planning and Strategic Solutions Division; Paul Nowak, Jr., Power Management and Distribution Branch; John Rice, Data Systems Branch; Stephen Robison, Technology Transfer Office; and Thomas Thompson, Aircraft Operations Office.



GRC-2016-C-02650

Photos by Bridget Caswell

Pictured, left to right, who reported for orientation, May 2: Jakupca, Nowak, Kennedy, Hiltabidel, Robison and Thompson. Not pictured: Rice.

Glenn's Upcoming 75th Anniversary Events

Chicago Air Show, Aug. 20 to 21
Cleveland National Air Show, Sept. 3 to 5
Glenn Hall of Fame Induction, Sept. 14

Connect With Glenn



More Than a Memory



Metzler

served in the Physics and Chemistry Division. The majority of his career centered on combustion research, where he did extensive work on supersonic combustor testing for ramjet engines. Metzler retired from the Combustion & Pollution Research Branch, Airbreathing Engines Division.



Reinmann

John J. "Jack" Reinmann, 83, a 1974 retiree with 33 years of service, died April 20. He joined the NACA/NASA workforce upon graduating the Case Institute of Technology and John Carroll University. Reinmann received a 1988 NASA Exceptional Service Medal for his pioneering research and management of NASA's Icing Research Program, which helped establish NASA Lewis as a center of excellence for aircraft icing research and flight safety technology. He retired as chief of the Icing and Cryogenic Technology Branch, Propulsion Systems Division.

Calendar

NASA RETIRED WOMEN'S LUNCHEON:

The NASA Retired Women's Luncheon is Thursday, August 18 at 1 p.m. at Nino's Italian Restaurant, 32652 Center Ridge Road, North Ridgeville. Please contact Gerry Ziemba at gto64gerry@yahoo.com or 330-273-4850 to reserve your place.

FARMERS MARKET: The Market will be returning to Glenn two more times this year! Mark your calendar for Tuesday, Aug. 30 and Tuesday, Sept. 27, from 10:30 a.m. to 1:30 p.m. Rain or shine... the market will go on! Stop by the Picnic Grounds to check out the new vendors and some of your favorite vendors from the past. POC: Bianca Gatto, 3-6313

CAS SHOWCASE 2016: The Convergent Aeronautics Solutions (CAS) Project Showcase will hold its second annual showcase in the MIC, Sept. 7-8, to give updates for its funded inter-center research projects. The showcase will provide NASA management and staff with a status update on the feasibility studies being conducted under CAS sponsorship. The showcase will feature poster sessions and tours on Sept. 7 and briefings on Sept. 8. POC: Peggy Cornell, 3-2748

SATURDAY TOURS AT LEWIS FIELD: Glenn's next Saturday tour is Sept. 10, featuring the Structural Dynamics Laboratory, where things get shaken to verify the survivability of a component.

For more information and a complete schedule, visit <http://www.nasa.gov/centers/glenn/events/tours.html>.

IFPTE LOCAL 28, LESA MEETING: LESA will hold its next membership meeting, Wednesday, Sep. 14, noon, in the Glenn Employee Center's Small Dining Room.

GLENN HALL OF FAME: The Second Class of Inductees will be inducted into Glenn Research Center's Hall of Fame during a ceremony on Wednesday, Sept. 14, from 1 to 3 p.m. in the MIC Auditorium. Retirees are welcome to attend but must register by Sept. 7. Please call the Anniversary Information line at 216-433-5555 or email anne.mills@nasa.gov to register.

National Aeronautics and Space Administration

John H. Glenn Research Center at Lewis Field

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September 2016 Calendar section deadline: Aug. 17, noon
News and feature stories require additional time

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Read *AeroSpace Frontiers* online at <http://www.nasa.gov/centers/glenn/news/AF/index.html>

Safety and Health Awareness Day

Continued from page 1

tion stations, mishap briefings and the Golden Shoe Health Walk.

Center Director Dr. Janet Kavandi welcomed employees and confirmed her commitment to safety during the kickoff held in the MIC Auditorium, which aired live to Plum Brook Station. Former astronaut, Jim Wetherbee, presented the keynote address, titled "Controlling Risk in a Dangerous World: From Challenger, Columbia to Deepwater Horizon Tragedies." Dr. Scott Shappell, professor, Embry-Riddle Aeronautical University, followed with a presentation on "Human Factors Related to Personnel Safety in the Workplace." Karen Meinert, deputy director, NASA Safety Center, shared the agency safety status, while Liang shared a video highlighting an interview with Kavandi emphasizing the importance of safety in our lives.

Many employees participated in the Golden Shoe Walk in the afternoon, and Shappell hosted a "Human Factors Workshop" at Lewis Field.

Glenn's Safety and Health Awareness Directorate Point of Contact Committee members will roll out the follow-on dialogue activity focusing on safety-related case studies.

By Doreen B. Zudell



Pictured clockwise:

Former astronaut, Jim Wetherbee, presented the keynote address.

Dr. Scott Shappell, talked about human factors related to personal safety in the workplace.

Employees participated in the annual Golden Shoe Walk.

Ergonomics was one of several topics featured through information stations.

Photos by Rami Daud

