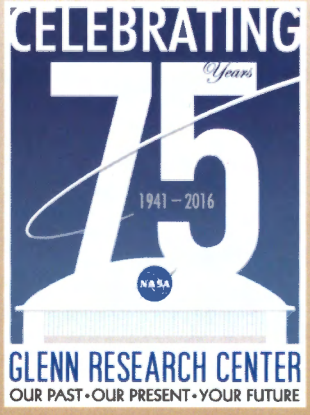
National Aeronautics and
Space Administration

GLENN
RESEARCH CENTER
HALL OF FAME

2016
INDUCTION CEREMONY

WEDNESDAY, SEPTEMBER 14, 2016



GREG DEE came to WKYC in February 2015. He is a native of Connecticut. Growing up in New England gave him exposure to all kinds of weather, beginning his love of all things storms.

Dee received his degree in meteorology from Florida State University as well as his master's degree in geography. His first job was as Chief Meteorologist in Dothan, Alabama. During his time there, Greg began to develop the skills necessary for covering severe weather. His coverage of an EF–3 tornado in Enterprise, Alabama, earned him the 2008 AMS Meteorologist of the Year award.

DR. MARLA PÉREZ-DAVIS serves as the deputy director of the National Aeronautics and Space Administration's John H. Glenn Research Center in Cleveland. In this capacity she shares with the center director responsibility for planning, organizing and managing the Agency level programs and projects assigned to the Center.

Immediately prior to her current assignment, Pérez-Davis served as deputy director of the Research and Engineering Directorate, a post she held since 2014. In this position, Pérez-Davis was responsible for leading, planning, coordinating, and managing all phases of Glenn's research and engineering activities to accomplish NASA missions.

Other key leadership positions Pérez-Davis held at Glenn include director of the Aeronautics Research Office from 2010 to 2014, where she served as the focal point for aeronautics research and provided project management, leadership, and oversight in support of the Agency's aeronautics research mission. Prior to that, she served as chief of the Project Liaison and Integration Office from 2007 to 2010 where her leadership resulted in streamlined business processes, improved contract management practices, and improved timeliness response to safety assurance activities. She also served as the chief of the Electrochemistry Branch, where her leadership resulted in strengthening the energy storage and power competencies as well as the establishment of new partnerships in support of NASA missions.

Pérez-Davis, a native of Puerto Rico, earned her bachelor's degree from the University of Puerto Rico; a Master of Science degree from the University of Toledo, and a Ph.D. from Case Western Reserve University in Chemical Engineering. In 2006, she completed NASA's Senior Executive Service Candidate Development Program and the Office of Personnel Management Program.

GLENN RESEARCH CENTER HALL OF FAME

AGENDA

Welcome

Star Spangled Banner
NASA Glenn Band

Master of Ceremonies
Mr. Greg Dee, WKYC Meteorologist

Remarks
Dr. Marla Pérez-Davis, Center Deputy Director

Video Remarks
Dr. Ellen Stofan, NASA Chief Scientist

Induction Presentations

Honorees
Sanford Gordon and **Bonnie McBride**
Represented by Joel and Sheldon Gordon and Molly Nesham

Dr. Harold R. Kaufman
Represented by Bruce Banks

Steven Szabo
Represented by Judy Szabo

Dr. R. Lynn Bondurant, Jr.

Dr. Julian M. Earls

Dr. Lonnie Reid

Dr. Eli Reshotko

Andrew J. Stofan

Cutting of the Cake
Honorees

Closing Remarks

Reception

SANFORD GORDON AND BONNIE MCBRIDE

Center scientists Sanford Gordon and Bonnie McBride worked side by side to develop and improve one of the most important and widely used computer programs in the aerospace industry. For over 45 years, the program and its upgraded versions have been used worldwide in designing and analyzing compressors, turbines, nozzles, engines, shock tubes, heat exchangers, and chemical processing equipment.

The program is now called Chemical Equilibrium with Applications (CEA), and over 2000 copies are in distribution. CEA calculates chemical equilibrium compositions and the properties of complex mixtures. Applications include assigned thermodynamic states, theoretical rocket performance, Chapman-Jouguet detonations, and shock-tube parameters for incident and reflected shocks. CEA is associated with independent databases of the transport and thermodynamic properties of over 2000 individual species.

Sanford Gordon pioneered the application of computers for calculating thermodynamic properties and for using these properties to model the behavior of reacting systems—beginning in 1950 to generate tables of thermodynamic functions and interpolation formulas for the Center. Bonnie McBride joined the Center in 1957, initially generating thermodynamic data for calculating chemical equilibrium composition and rocket performance. In the mid-1960s, she did a major rewrite of the code that Gordon had been working on, resulting in the Chemical Equilibrium Code for 1971 (CEC71). Then McBride and Gordon consolidated and documented the codes into a single FORTRAN IV code—Properties and Coefficients 1 (PAC1).

In 1993 McBride and Gordon were awarded a Space Act Monetary Award by NASA's Inventions and Contributions Board for their Chemical Equilibrium and Transport Properties Code (CET89)—proclaiming it one of NASA's exceptional scientific and technical contributions for the 1990s. The program was used worldwide in applications ranging from the Space Shuttle Main Engine design to testing nuclear propulsion concepts.

Gordon and McBride continued to improve the databases and codes until their deaths. Sanford Gordon died in 2001 after 37 years with NASA and several more with its contractors, and Bonnie J. McBride died in 2005 after 48 years with NASA. She was awarded the NASA Exceptional Service Award in 1991 for her work. Gordon and McBride's work continues to make an impact around the world as the Center continues to host a Web site for widespread use of the most recent version of the code.

DR. HAROLD R. KAUFMAN

Center researcher Harold Kaufman invented an electron bombardment ion thruster in 1959 that became the basis for all ensuing U.S. ion propulsion systems—including the one propelling the Dawn spacecraft currently exploring the asteroid belt. After retiring from NASA, Dr. Kaufman adapted the technology for Earth applications and developed a gridless thruster that became another industry standard. Glenn researchers continue to refine this technology for long-duration spaceflight.

Kaufman joined the NACA Lewis Research Center in 1951, initially working on afterburner cooling and the use of liquid hydrogen in jet engines. In 1958 he was assigned to the new Electromagnetic Propulsion Division, which was exploring electric propulsion for spaceflight. While working for the division, Kaufman developed his own ion thruster design.

Kaufman's engine vaporized liquid mercury, which was then bombarded by electrons to create more electrons and ions. A negatively charged electric field and a positively charged screen drew the ions rearward and out of the engine as thrust. In 1964 the thruster operated for over 30 minutes during the Space Electric Rocket Test (SERT I)—the first demonstration of electric propulsion in space. SERT II, which launched when Kaufman was the head of the Ion Physics Branch, did not meet its 6-month operation target in 1970. However, SERT II became a resounding success when engineers were able to restart the engines in 1973, operating the thrusters for 8 years and restarting them hundreds of times.

Kaufman became Assistant Chief of the Electromagnetic Propulsion Division in 1968 and earned a Ph.D. at Colorado State University (CSU) in 1971. The division not only improved Kaufman's thruster, but developed alternative electric thrusters. Dr. Kaufman and his thruster were awarded the American Institute of Aeronautics and Astronautics (AIAA) James H. Wyld Propulsion Award, an IR 100 award, and NASA's Exceptional Service Award.

After retiring from NASA in 1974, Dr. Kaufman served as Chair of CSU's Physics Department where he modified the electron beam for thin-film applications like etching and sputtering, and earned many patents. After retiring from CSU in 1984, Dr. Kaufman invented the end-Hall ion source, which is the basis of most gridless ion sources used in industry today. He is currently professor emeritus for CSU and runs Kaufman and Robinson, Inc..

STEVEN V. SZABO, JR.

Steven Szabo's nearly 30-year career was marked by sustained accomplishments and achievements in engineering, program management, and leadership. In addition to myriad technical abilities, he had natural leadership skills marked by his capacity to inspire others, build relationships, and invest in the success of others.

Szabo began his career at the NASA Lewis Research Center in 1963 as a systems engineer in the Centaur Project Office. In just a few years, he was promoted to project engineer for the Centaur full-scale engine firing tests at Lewis' Plum Brook Station. In 1973 and 1974, he served as project engineer for the Centaur Standard Shroud cryogenic unlatch tests and the Titan/Centaur missions.

Within the Launch Vehicles Directorate, he served as Chief of the Mechanical Engineering Branch, Chief of the Systems Engineering Office, and Chief of the Seasat Launch Vehicles Office. He was awarded the NASA Exceptional Service Medal in 1978 for exceptional project management skill and leadership in establishing and directing the launch vehicle system support for Project Seasat. In that same year, he was named Associate Division Chief of Lewis' Vehicles Engineering Division.

Szabo served as Deputy Chief of the Launch Vehicles Division until 1984 when he was named Chief of the Space Transportation Engineering Division, directing the engineering requirements of the design, testing, and operational phases of Lewis' Atlas/Centaur and Shuttle-Centaur programs.

In 1986, he was given the task of establishing the Engineering Directorate at Lewis, serving as its Director from 1986 until 1991. For organizing and managing the new directorate, he was awarded the NASA Outstanding Leadership Medal. Szabo also received the Presidential Rank of Meritorious Executive in 1988 for his distinguished achievements as an engineer and a leader, and NASA's Federal Engineer of the Year Award in 1989.

He was appointed head of Space Flight Systems in September 1991, but shortly after this appointment he was diagnosed with multiple myeloma, which he battled courageously until his death in March 1993. Szabo's untimely death of cancer at age 51 was a loss felt deeply at the Center. To celebrate his career and memory, the Center created the Steve Szabo Engineering Excellence Award, our most prestigious engineering award.

DR. R. LYNN BONDURANT, JR.

Lynn Bondurant began his career at the NASA Lewis Research Center in 1981 to direct the newly established Public Services Office. Before that, educational outreach had been spread out around the Center and lacked focus.

Dr. Bondurant's broad experience in science, technology, mathematics, and engineering (STEM) education equipped him with a unique perspective that enabled him to revitalize the Center's educational department and develop creative programming that paved the way for the robust outreach programs that we have today. His creative leadership and passion for science education brought a clear vision of the Center's successful STEM outreach program, enhancing the Center's visibility and prestige while inspiring a whole generation of youth to pursue careers in science.

Dr. Bondurant was a tireless educator who wrote numerous articles and books on STEM education topics. He also presented over 70 NASA television programs, as well as working with WVIZ to create and host the four-part interactive television series "Touching Tomorrow."

His enthusiasm and dedication went well beyond managing the program. He presented talks, designed and led workshops for students and educators, and developed innovative learning experiences. One of these was the "Sky as Your Classroom" workshop, which took two classrooms of students on a simulated "shuttle mission" that included months of mission planning followed by a 4-hour, 60-mile journey in a bus outfitted like a shuttle, where the students executed their mission plan. Another was the Mobile Aeronautics Education Lab traveling exhibits trailer, with the first trailer being completed in 1996 in partnership with Cuyahoga Community College (Tri-C).

Dr. Bondurant met constantly with local officials and educational partners on how the Center could best serve the region's students. He was also a strong ally of special needs students in STEM, advocating for the first group of these students to attend Space Camp, the first captioning of a NASA film for the hearing impaired, and the translation of several NASA publications into braille.

Dr. Bondurant's exceptional leadership resulted in numerous awards including the NASA Exceptional Service Medal and NASA Outstanding Leadership Medal. Retiring in 1999 after over 20 years of Government service, he continued to be involved in many educational initiatives, including serving as the director of Education for the X Prize Foundation.

DR. JULIAN M. EARLS

Julian Earls began his career at the Center as a physicist, and he rose through the ranks to become the ninth center director of the NASA Glenn Research Center. Along the way he authored numerous technical papers, was awarded 10 university degrees, mentored students and colleagues, championed equal opportunity, and was often recognized for his exceptional leadership and unparalleled public speaking abilities.

Early on he established himself as a leader in the field of health physics. In 1968 he became head of the Health Physics and Licensing section of the Nuclear Systems Division as well as the Radiological Safety Officer, authoring numerous technical papers and NASA's first health-physics guides. In 1972 he earned both a doctorate in public health in radiation physics and the equivalent of a master's of public health in environmental health while he served as the Chief of the Center's Environmental Health Office.

Dr. Earls was a trailblazer for diversity: He was the Center's first African American section head, office chief, division chief, and deputy director. In addition to serving as a role model, Dr. Earls was committed to empowering others to prepare, seek, and excel in new opportunities by generously mentoring employees and students. He was recognized by being elected into the inaugural class of the National Black College Alumni Hall of Fame with such distinguished individuals as Dr. Martin Luther King, Jr., and Justice Thurgood Marshall.

After serving as the Chief of the Health, Safety, and Security Division; Director of the Office of Health Services; and Center Deputy Director, Dr. Earls was appointed Center Director in 2003 by Administrator Sean O'Keefe. In his nearly 2 years as Center Director, he brought a style of leadership that combined enthusiasm, humility, and humor. He helped to elevate Glenn's presence in the region and the Center to navigate difficult times. His numerous awards include the NASA Exceptional Achievement Medal, the NASA Outstanding Leadership Medal, and the Presidential Rank Award for Meritorious Service (twice).

Dr. Earls ended his 40-year NASA career with his retirement in 2005. Since that time, he has served as the Cleveland State University Executive in Residence—continuing to mentor and inspire students.

DR. LONNIE REID

Dr. Lonnie Reid is nationally recognized for his knowledge of internal flow in advanced aerospace propulsion systems. His long, distinguished career includes integrating the theoretical and experimental elements of fluid dynamics to expand the database of compressor and fan design, serving as Chief of the Center's Internal Fluid Mechanics Division, and recruiting and mentoring the next generation of scientists and engineers.

Reid joined the Center as a research engineer in 1961 and spent the next 20 years as a researcher and manager in the Compressor Section of the Fluid Systems Components Division. In the early 1960s the group improved pump designs and showed that hydrogen could be pumped in the difficult cavitating conditions on the Centaur and Saturn upper-stage rockets.

In 1966 he was appointed to the U.S. Supersonic Transport Source Selection Evaluation Group. The group increased aircraft engine efficiency and performance and expanded the important experimental database on compressor blades. Reid then served as head of the Fan and Compressor Branch's Multi-Stage Compressor Section, head of the Aerodynamics Section in the Altitude Wind Tunnel Project Office, Chief of the Computational Applications Branch, and head of the Turbomachinery Technology Branch, which developed the first supersonic through-flow fan design for turbofan engines.

In 1989 Reid earned his Ph.D. from the University of Toledo, was promoted to Chief of the Internal Fluids Mechanics Division, and was appointed to the Senior Executive Service–becoming the first African-American employee at the Center to achieve either position. He worked closely with industry to facilitate technology transfer, identify areas that required research, and ensure that the division addressed those concerns. He retired in October 1993 with 32 years of NASA service. In 1998, after working as a contractor for 5 years, Dr. Reid founded AP Solutions, Inc., which supported the Ultra Efficient Engine Technology program, the General Aviation Program, and the development of the Joint Strike Fighter.

Dr. Reid's many accolades include receiving NASA's Exceptional Service Medal, entering the Senior Executive Service, and being inducted into the Ohio Science, Technology and Industry Hall of Fame. He has left an enduring legacy in the field of turbomachinery and a generation of engineers who have benefited from his technical knowledge and his personal interest in their success.

DR. ELI RESHOTKO

Eli Reshotko has made seminal contributions in aerodynamics and fluid mechanics and is internationally renowned for his pioneering fundamental research on compressible boundary layers, their stability, and transition. He is also known for his deep understanding of flow physics and his ability to apply his understanding to practical applications.

Reshotko joined the Lewis laboratory in 1951 as research engineer in the Supersonic Propulsion Division's Propulsion Aerodynamics Section. Although most of the Lab's research was applied, Reshotko and a small cadre of others focused on basic research. Reshotko explored the aerodynamics of high-speed inlets and nozzles, not only providing understanding of compressible boundary-layer theory but introducing (pre-computer-era) methods for calculating high-speed flows and heat transfer. In 1956 he was named head of the division's Fluid Mechanics Section, where he continued to study boundary-layer transition and the high-speed aerodynamic heating of objects of different shapes.

In 1957, Reshotko was selected as one of only four scientists nationally to receive a Guggenheim Fellowship for doctoral aeronautical research. He further studied compressible boundary layers and laminar and turbulent boundary layers at the California Institute of Technology. After earning a Ph.D. in aeronautics and physics in 1960, he became the head of the Center's new Electromagnetic Propulsion Division's High Temperature Plasma Section. In 1962 He was promoted to Chief of Plasma Physics Branch. He and his staff advanced the state of the art in magnetohydrodynamic power generation, ion heating, and nuclear reactor safety.

In 1964 Dr. Reshotko left the Center to work at Case Western Reserve University (CWRU), where he continued his research of boundary layers and stability theory while teaching numerous engineering and fluid mechanics courses. Since 1970 he has served as the Chairman of the U.S. Boundary Layer Transition Study Group and is currently CWRU's Kent H. Smith Professor Emeritus of Engineering.

At CWRU, Dr. Reshotko has continued to work closely with the Center, including in seal dynamics for space power systems, fluid transfer in propellant tanks, flow transition for the National Aerospace Plane, and icing research. He has authored or co-authored over 90 technical publications for NASA and over 200 journal articles, review papers, conference papers, and technical reports. He was elected to the National Academy of Engineering in 1984 and has received numerous awards.

ANDREW J. STOFAN

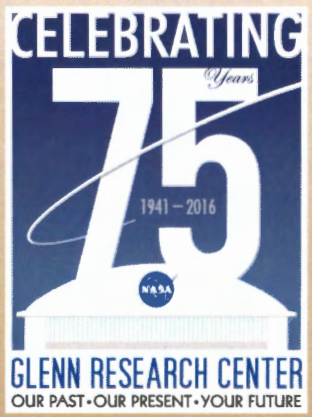
Andrew "Andy" Stofan's management in the 1960s helped to make the Centaur rocket successful, and his management of the Titan/Centaur Program and the Launch Vehicles Division produced some of NASA's biggest successes of the 1970s. His biggest success, however, may have been as Center Director in the early 1980s, when he revitalized the Center through strategic planning, acquiring several major programs and implementing participative management.

Stofan joined the Lewis lab in 1958 as a research engineer and worked in the 1960s to improve the handling of propellants in the Centaur and Saturn upper stages. Stofan managed the update of Centaur and its integration with Titan in 1969, becoming the head of the Titan/Centaur Program Office in 1970. In 1974 he was promoted to Director of the Launch Vehicles Directorate, where he managed 10 successful launches of Atlas/Centaur and 6 of Titan/Centaur, including the Viking and Voyager missions.

Stofan went to NASA Headquarters in 1978, becoming Deputy Associate Administrator for the Office of Space Science in 1982 and Acting Associate Administrator for Space Science in 1980. He returned to Lewis in 1982 to serve as Center Director. Lewis had suffered budget cuts, facility closures, downsizing, and threatened closure. Stofan rebuilt Lewis through long-term strategic planning that included as many of the Center's managers as possible. This resulted in Lewis' first strategic plan, the acquisition of four high-profile programs—including the Shuttle-Centaur and the Space Station power system, the restoration of Center morale, and the first new hires in years.

Stofan returned to Headquarters in 1986 as Associate Administrator for the Space Station Office. He retired from NASA in 1988 with 30 years of service. Afterward, he worked as a vice president for Martin Marietta Astronautics, the President of Analex Corporation, and a director at Lockheed Missiles and Space Company. His many awards include the NASA Exceptional Service Medal, NASA Distinguished Service Award, Presidential Rank of Meritorious Executive, and Presidential Rank Award of Distinguished Executive.

Stofan's work led to major NASA successes, but he considers his 4 years as Center Director to be his most important. He not only provided the hope that was needed to carry on, but empowered staff with the confidence needed to create their own successful destiny.



www.nasa.gov

PS–01997–3–0916