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Langley Research Center

News Researcher

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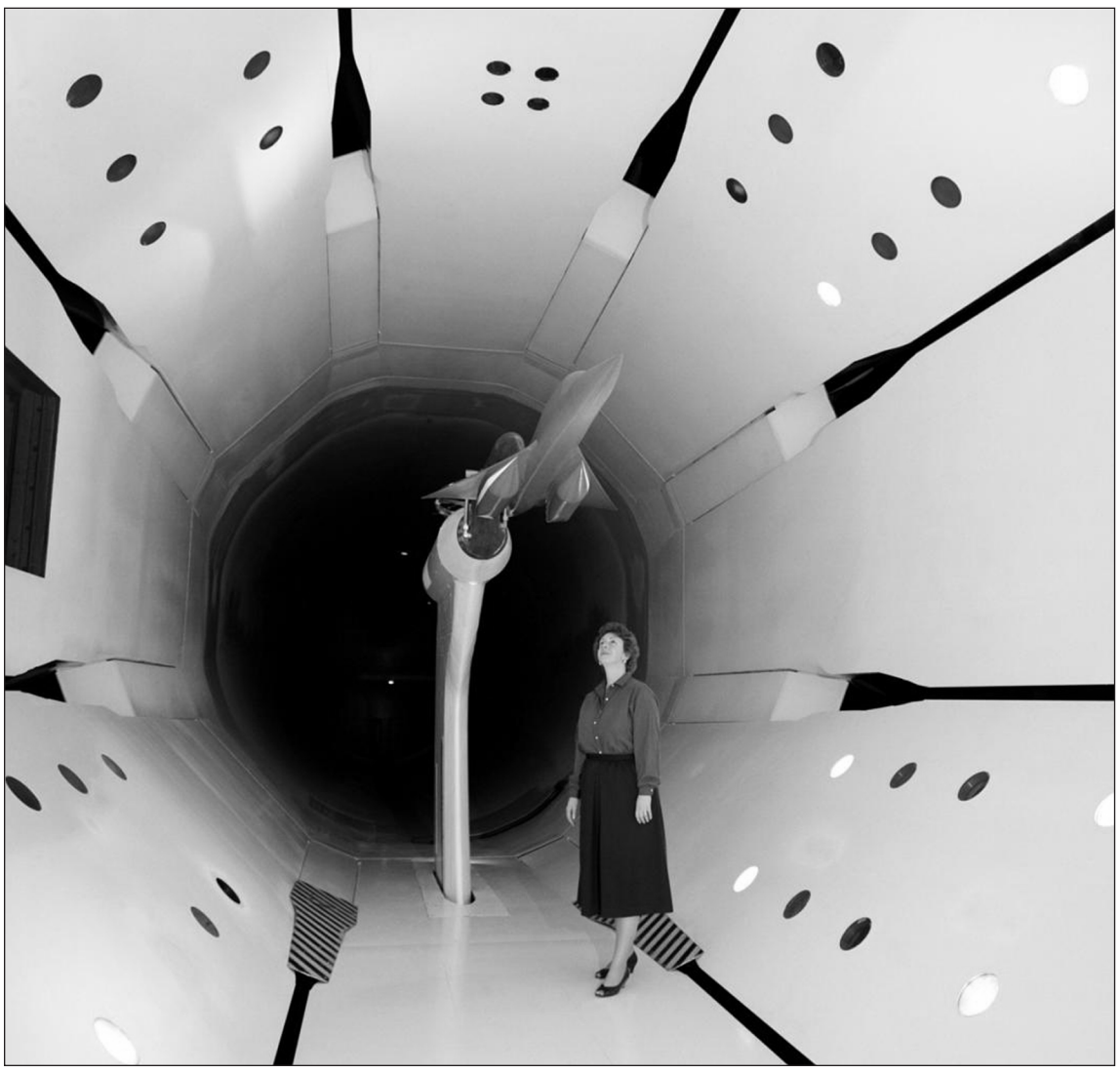
‘Propellers To Scramjets’

16-Foot Tunnel Leaves Powerful Legacy



Langley Research Center employee Linda Bangert examines a Boeing Super Cruiser Fighter model in the test section of the 16- Foot Transonic Tunnel in 1990. Bangert is currently assigned to the Quiet Aircraft Technology Project.

NASA file photo

By MARNY SKORA
Langley Research Center

Langley Research Center’s 16-Foot Transonic Tunnel will retire at the end of the month, one month shy of 63 years of service.

Retiring the tunnel is part of a national initiative to optimize government-owned wind tunnels. A NASA-Department of Defense alliance studying investment planning in wind tunnel assets recommended the shutdown in 2002. Since that time, the tunnel and its staff of scientists, engineers and technicians have worked to complete research commitments.

Much of the staff has already disbursed — other tunnels on Center are clamoring for experienced workers. The employees who remain are completing the final test. They will then begin an orderly closeout of the historic tunnel, inventorying hardware and removing equipment that can be used elsewhere.

■ Langley employees are invited to tour the 16-Foot Transonic Tunnel at 10 a.m. and 11 a.m. Oct. 1. Employees can register by e-mailing Pam Verniel at <pamela.j.verniel@nasa.gov> and indicating which time is preferable. Tours will be offered on a first-come, first-served basis.

The last test — a NASA-Air Force-Boeing cooperative study of a single-engine test demonstrator launch configuration — underscores the tunnel’s legacy: aerospace research across the entire flight range.

The 16-Foot tunnel began operation in November 1941. Since that time, it has supported Agency initiatives, all major aircraft companies and most major military programs in their development stages and in ongoing propulsion integration research.

Its heritage reads like a “Who’s Who” of famous aircraft and spacecraft: Corsair, Bell X-1, Buffalo, Thunderbolt, Hustler, Aardvark, Eagle, Hornet, Harrier, Galaxy, X-15, Apollo, RLV, Shuttle, Tomcat, B-1, B-2, X-43, to name just a few. In addition, many fundamental aviation advances were made at the tunnel that

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O’Keefe: ‘We Will Find Out What Happened To Genesis’

NASA Administrator Sean O’Keefe offered the following statement on Sept. 8 about the Genesis Sample Return Mission, which crash-landed at the U.S. Air Force Test and Training Range in Utah after its drogue chute failed to open.

“We’re encouraged by the news out of Utah, despite the hard impact landing of the Genesis Sample Return capsule. The spacecraft was designed in a way to give us the best chance at salvaging the valuable science payload should we suffer a landing like the one we witnessed today.

“Our re-entry plan was based on safety, and the choice of Dugway was intentional. While today’s developments may be disappointing to some, I know the entire NASA family is thankful no one was injured.

“Exploration of the heavens is not an easy task. Our ability to travel throughout our solar system is limited, whether by human tended or robotic craft. Genesis was an experiment to journey far from home and return with new clues and possible answers to some of the fundamental questions regarding the origin of our universe.

“With each new mission, we push the frontiers of our knowledge and technology, and we’re hopeful that what appears to be a setback, will eventually return some impressive results. After all, this isn’t an Olympic event where we’re awarded a medal for a perfect landing. Our final achievement will be measured by what we’ve learned over the entire three-year mission.

“Our scientists and engineers across NASA and our Jet Propulsion Laboratory are the best in the world. We will find out what happened to Genesis, and we’ll continue our quest to accomplish the goals spelled out in our Vision for Space Exploration.”

For information about the Genesis Sample Return Mission on the Internet, visit: <http://www.nasa.gov/genesis>.

Inside This Issue:

NASA Vision: *To improve life here, To extend life to there, To find life beyond*
NASA Mission: *To understand and protect our home planet ● To explore the Universe and search for life*
To inspire the next generation of explorers … as only NASA can

Briefs

Around the Agency

NASA DEVELOPS TOOLS FOR CO2 MANAGEMENT

NASA scientists have unveiled Internet software tools that will aid in the removal of carbon dioxide from the atmosphere.

Researchers at Ames Research Center developed the CQUEST science information visualization and modeling software. It enables government agencies, land managers and farm cooperatives to display, predict and analyze carbon dioxide (CO2) fluxes in U.S. ecosystems.

The application uses "what if" scenarios, so land managers can decide where and when planting trees, mixing agriculture with trees or restoring native grasslands are effective for "sponging up" CO2 emitted into the atmosphere by industrial activities.

The CQUEST science information visualization tool differs from most Web-based tools, because it uses data and images from a new generation of NASA Earth-observing satellites and sensors. Spacecraft, such as the Terra satellite, provide data and information down to a granular level of several square miles of land.

"Carbon recycling is critical to the health of the global environment," said Christopher Potter, the application's lead developer. "It helps scientists understand the linkages among the land, atmosphere and oceans, and either directly or indirectly affects the climate by regulating the concentrations of greenhouse gases in the atmosphere."

The NASA CQUEST application is available on the Internet at: <http://geo.arc.nasa.gov/website/cquestwebsite/>. NASA HQ RELEASE: 04-284

GRACE MISSION WEIGHS IN ON EARTH'S CLIMATE

For the first time, scientists have demonstrated precise measurements of Earth's changing gravity field can effectively monitor changes in the planet's climate and weather.

This finding comes from more than a year's worth of data from the Gravity Recovery and Climate Experiment (GRACE). GRACE is a two-spacecraft, joint partnership of NASA and the German Aerospace Center.

Results published in the journal Science show monthly changes in the distribution of water and ice masses could be estimated by measuring changes in Earth's gravity field. The GRACE data measured the weight of up to 10 centimeters (four inches) of groundwater accumulations from heavy tropical rains, particularly in the Amazon basin and Southeast Asia. Smaller signals caused by changes in ocean circulation were also visible.

Launched in March 2002, GRACE tracks changes in Earth's gravity field. GRACE senses minute variations in gravitational pull from local changes in Earth's mass.

For more information about GRACE on the Internet, visit: <http://www.csr.utexas.edu/GRACE>. NASA HQ RELEASE: 04-286

Researcher News

The Researcher News is an official publication of Langley Research Center, National Aeronautics and Space Administration, Hampton, Va., 23681-2199. It is published every other Friday in the interest of all Langley employees, contractors and retirees and has a circulation of approximately 7,200. It is distributed to all Langley employees, contractors, retirees and on-site university personnel, with limited distribution to NASA Headquarters, other NASA centers and, by special request, to other non-NASA individuals and organizations. Questions related to the content and distribution of the Researcher News should be addressed to Keith Henry, Mail Stop 115, (757) 864-6120. Submit contributions and off-site address changes to the editor via e-mail <j.r.roberts@larc.nasa.gov>, fax (757) 864-6477, telephone (757) 864-8150 or Mail Stop 147. Articles, photos and announcements are due by 5 p.m. the Monday following the date of this issue.

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The privilege of listing announcements in this publication is restricted to the employees, contractors and retirees of the Langley Research Center. Articles must be offered without regard to race, color, religion, sex or national origin. All materials are subject to editing.

The Researcher News accepts signed letters to the editor from Langley Research Center employees, on-site contractors and retirees. Letters are limited to 250 words and will be edited only for grammar. When necessary, letters may be edited for space, but only with the author's approval. Letter-writers are limited to one submission on a topic every six months. Questions regarding this policy should be directed to Keith Henry, managing editor, at 864-6120 or <h.k.henry@nasa.gov>.

Read the Researcher News online at <http://researchernews.larc.nasa.gov>.

Governors Conference

Martin Frederick (left), deputy director of NASA's Science Mission Directorate, poses with graduate students (left to right) Amanda Harris, Samuel Miller and Jonathan Gleason on Sept. 13 at the Governor's Mansion in Richmond. The three students, representing Langley Research Center's DEVELOP National Program, attended the 70th annual Southern Governors Conference and gave a presentation on student research in disaster management and how Langley's research will revolutionize weather forecasting. Gleason and Miller are graduate students at Old Dominion University; Harris is an MBA candidate at King College.

Photo by Michael Ruiz

Langley Recognized Twice At Minority Business Awards

Langley Research Center was honored twice at NASA's 13th annual Minority Business and Advocates Awards ceremony.

Crewestone Technologies, which provides video services at Langley, was named Minority Subcontractor of the Year, and Langley was cited for meeting or exceeding all negotiated socio-economic small business goals.

Other centers recognized were Glenn Research Center, Marshall Space Flight Center and NASA Headquarters. It was the fourth consecutive year Langley received the recognition.

Science Systems and Applications, Inc. (SSAI) was named Minority Contractor of the Year, and Cimarron, Inc. was named the Women Owned Business of the Year.

NASA also recognized outstanding advocates within the agency for their contributions and innovative approaches to using minority and women owned businesses. These NASA's Exceptional Achievement Medals were given in three categories, Technical, Procurement, and Small Business.

The winner in the Technical category was Joseph Conley from Ames Research Center. In Procurement, Carlos Torres, also from Ames, was recognized. In the Small Business category, Mary Helen Ruiz of Jet Propulsion Laboratory was recognized.

Winners of the NASA Office of Small and Disadvantaged Business Utilization (OSDBU) Special Recognition Awards for lifetime achievement or a single outstanding act were: The Minority Business and Professionals Network, Innovative Technologies, Inc., and Frontier Electronic Systems.

For information and list of winners on the Web, visit: <http://www.hq.nasa.gov/office/codek/>.

In Memoriam

Robert MacLachlan

Robert MacLachlan died on Aug. 23 at the age of 84. MacLachlan, a native of Calgary, Canada, worked for NACA and NASA, retiring in 1970 after 29 years of service.

Donald Dean Resner Sr.

Donald Dean Resner Sr. died on Sept. 11 at the age of 71. Resner served in the U.S. Air Force for 20 years and was a veteran of the Vietnam War. He went on to work for 12 years as a security officer at Langley Research Center.

'Wednesday Forums' Continue Through December

Langley Research Center's Kick Start Teams will continue to host "Wednesday Forums" at 11 a.m. every Wednesday through December in the Hampton Room of the H.J.E. Reid Conference Center. Each forum includes four Kick Start Team representatives — two from institutional teams and two from technical teams — and an opportunity for employees to ask questions about NASA's Transformation.

For more information, visit the Kick Start web site at: <http://kickstart/>.

Langley Instrument Goes 'Gonzo'

WINDEX Hardware Installed On NOAA's Hurricane Hunter

Langley Research Center recently delivered a new instrument to aid in studying the genesis and evolution of hurricanes and put it to the test during Hurricane Charley.

Based on the GPS reflection technique pioneered at Langley, WINDEX produces real-time wind speed retrievals and displays the data on a moving map.

The instrument has been installed on one of NOAA's Hurricane Hunters, a Gulfstream IV nicknamed "Gonzo." Based at MacDill Air Force Base in Florida, Gonzo is one of NOAA's three major research Hurricane Hunters. The other two, "Miss Piggy" and "Kermit," are the more familiar P-3s, which penetrate into the "eye" of the storms. Gonzo flies around the periphery of a storm, deploying GPS-based dropsondes.

The dropsondes are the "gold-standard" for determining surface winds but can only be deployed sparingly. The WINDEX system allows for a continuous map between dropsonde releases and monitors the ocean surface for suspicious areas. The GPS technique is insensitive to clouds or rain and can give information concerning surface conditions not available to the flight crew.

The WINDEX instrument consists of a GPS reflection receiver and a wind speed server processor. The server receives the GPS reflection data produced by the integral receiver, performs processing to estimate the surface wind speed, then makes the wind speed data available as a moving map display to requesting client processors on the aircraft network.

Langley Research Center employees (left to right) Sandy Hartraft, George Ganoe, Martin Press (SHARP student), Steve Katzberg, Larry Cowen and Rick Walker pose with the WINDEX the instrument test unit.

Photo by Jeff Caplan

Information associated with the reflection point includes the estimated wind speed, and a confidence factor that gives the researcher an idea of how reliable the wind speed measurement is.

Already in use, the first data sets obtained by WINDEX were from Hurricane Charley, which devastated Florida's west coast near Punta Gorda. Comparisons with dropsonde data will be done as soon as these data sets become available to trim the calibration of the WINDEX retrievals.

Langley's research interest is in obtaining reflectivity data from the 41,000-foot altitude and high speed of the Gulfstream IV. As altitude and flight platform speed increase, effects of Doppler shift on the reflected signal become apparent. Doppler shift can affect the calibration of WINDEX, while quantifying these effects can help determine the suitability of the GPS technique for satellite application.

The GPS reflection technique for ocean winds was developed in 1998 by Stephen J. Katzberg of Langley's Airborne Systems Competency and Bing Lin of Langley's Atmospheric Sciences Competency and is now a well-established method for remote sensing of ocean surface winds.

The technique is based on the increased ocean roughness resulting from surface winds. The wind establishes a surface "mean square slope" of the ocean waves proportional to wind speed, which in turn modifies the properties of the GPS reflected signal. Measurements are made by specially modified GPS receivers, also produced at Langley. Algorithms developed at Langley convert the data to geo-referenced surface wind speeds.

Additional processing can generate wind direction as well, making it possible to remotely sense surface wind vectors for a complete characterization of ocean wind fields.

Langley has installed other GPS reflection systems on the Hurricane Hunter P-3s, which are purely research in nature and are meant to acquire data sets from extreme wind speed conditions. The WINDEX system is unique in that it represents the first version of the GPS reflection technique to be tested in a quasi-operational mode.

Langley Supports Annual AMS Conference

By KATHERINE E. LORENTZ
SAIC

The American Meteorological Society (AMS) held its 13th Conference on Satellite Meteorology and Oceanography from Sept. 20-23 at the Norfolk Waterside Marriott. Atmospheric scientists, engineers, computer scientists and others interested in satellite meteorology and oceanography convened on Hampton Roads for the conference.

Langley Research Center showed strong support for the conference, with four invited presentations and approximately 30 poster presentations.

"Langley's enthusiastic participation represents more than 10 percent of all of the presentations," said program chair Elaine Prins.

In addition to presenters from three other NASA centers — Goddard Space Flight Center, Marshall Space Flight Center and Stennis Space Center — there were presentations from the Joint Center for Satellite Data Assimilation in Camp Springs, Md.; NOAA; and the World Meteorological Organization. Participating academic institutions included Colorado State University; Florida State University; Hofstra University; Macquarie University in Sydney, Australia; National Taiwan University; the University of Alabama; the University of Bern in Switzerland; the University of Leicester in the United Kingdom; the University of Maryland; the University of Valencia in Spain; the University of Virginia; and the University of Wisconsin.

The AMS Satellite Meteorology and Oceanography conference is unique in that it brings together work relating to both research satellites and operational satellites. This year's conference theme reflects such a synthesis: "The next generation of environmental sensors and emerging applications in satellite meteorology and oceanography."

Below are the Langley presenters, starting with the invited presentations where the four presentations are listed by session title and presentation title. The poster sessions are listed by the session title only. Following some of the poster author's names within that section is a number indicating how many posters they are presenting within the session.

Invited Presentations

Environmental Applications

■ "A Good IDEA (Infusing satellite Data into Environmental Applications)," D. Neil, J. Fishman, R.B. Pierce, and J. Al-Saadi (NASA); J. Szykman (EPA); and C. Kittaka (SAIC).

■ "Renewable Energy Applications from NASA Satellite Analysis and Modeling," C.H. Whitlock, W.S. Chandler, and J.M. Hoell, Jr. (SAIC); P.W. Stackhouse, Jr. (NASA); and T. Zhang (AS&M).

Retrievals and Cloud Products

■ "Students as Ground Observers for Satellite Cloud Retrieval Validation," L.H. Chambers, P.K. Costulis, and D. Young (NASA); and T.M. Rogerson (SAIC).

■ "Shortwave and Longwave Top-of-Atmosphere Radiative Flux Estimation From the Clouds and the Earth's Radiant Energy System Instrument," N.G. Loeb and S. Kato (Hampton University); K. Loukachine (SAIC); and N. Manalo-Smith (AS&M).

Poster Sessions

■ **New and Future Sensors and Applications:** M.A. Avery, T. Charlock, A.M. Larar, John J. Murray, W.L. Smith, Jr., W.L. Smith, Sr., and D.K. Zhou (NASA); N. Manalo-Smith, F.G. Rose, and D.A. Rutan (AS&M); R. Knudsen (William & Mary); N.G. Loeb (Hampton University); and K. Loukachine (SAIC).

■ **Operational Products:** E.V. Browell, T.D. Fairlie, J.J. Murray, and R.B. Pierce (NASA).

■ **Climatology and Long-Term Studies:** L.H. Chambers, T. Charlock, Y. Hu, D.P. Kratz, R.B. Lee, III (2), P. Minnis (5), K.J. Priestley, P.W. Stackhouse, Jr., B.A. Wielicki (5), T. Wong (2), and D.F. Young (3) (NASA); R.F. Arduini, R.R. Brown, Y. Chen (2), S.L. Gibson, W.F. Miller, S. Sun-Mack (3), S. Thomas, Q. Trepte, and R.S. Wilson, III (SAIC); J.K. Ayers, S.J. Cox, D.R. Doelling (2), S.K. Gupta, J. Huang, D.F. Keyes, M.M. Khaiyer, J.C. Mikovitz, and M.L. Nordeen (AS&M); and N.G. Loeb (Hampton University).

■ **Retrievals and Cloud Products:** J.K. Ayers (2), V. Chakrapani, D.R. Doelling (3), A.V. Gambheer, J. Huang (2), Z. Jin, M.M. Khaiyer (5), M.L. Nordeen (2), G.D. Nowicki, R. Palikondra (2), D. Phan, F. Rose, D.A. Rutan, D.A. Spangenberg (4), and Y.H. Yi (AS&M); J. Al-Saadi, T.P. Charlock, J.H. Crawford, B. Lin (2), P. Minnis (7), L. Nguyen (3), R.B. Pierce, W.L. Smith, Jr. (3), K.-M. Xu, and D.F. Young (2) (NASA); and R.F. Arduini, Y.Chen, A. Fan (2), C. Kittaka, S. Sun-Mack (2), and Q. Trepte (SAIC).

Katherine E. Lorentz works for SAIC in support of Langley's Atmospheric Sciences Competency.

Renowned Women To Speak At Langley

Langley Research Center will host presentations by two nationally and internationally renowned women in the upcoming weeks: Deborah Tabart will present "Can You See Koalas From Space?" at 2 p.m. Sept. 28 in the Pearl Young Theater, and Johnnetta Betsch Cole will speak during the Center's Diversity Day activities from 11 a.m. to 1 p.m. Oct. 8 in the H.J.E. Reid Conference Center.

Deborah Tabart

Tabart, the executive director of the Australian Koala Foundation (AKF), is known internationally as "the koala woman." Her presentation outlines her vision for how technology can save not only koalas but many other species of the world.

"What I love is for the scientists to then think of projects that can prove or not prove that we can do it," Tabart said. "What I know we can offer is lots of data and expertise over most of the koala's range, including ground-based radiometric data at Koala Beach (one of our test sites). We have also dabbled into remote sensing."


Tabart


Cole

Tabart's commitment to the AKF and environmental campaigning is unwavering.

Under her guidance, the AKF has grown into an internationally recognized scientific organization, winning a Computerworld Smithsonian Medal for excellence in mapping koala habitats. Additionally she has bought the central message of "save the koalas" to the forefront via innovative and creative education programs. The AKF has an eco-tour business and has contributed $5 million to research and conservation.

Johnnetta Betsch Cole

Cole, president of Bennett College for Women in Greensboro, N.C., made history in 1987 by becoming the first African-American woman to serve as president of Spelman College. In May of this year, she became the first African-American to serve as chair of the board of United Way of America.

Cole is president emerita of Spelman College and Professor emerita of Emory University from which she retired as Presidential Distinguished Professor of Anthropology, Women's Studies and African American Studies.

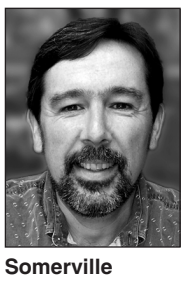
Cole is an active participant in numerous community and civic organizations, including The Carter Center, the National Visionary Leadership Project, The TransAfrica Forum and the United Way of Greater Greensboro. She is a member of Delta Sigma Theta Sorority, The Links, Inc., and the National Council of Negro Women.

Cole is the guest speaker for Langley's Diversity Day. The event, sponsored by the Diversity Awareness Committee, features a variety of cultural displays and demonstrations, a special presentation by Langley's Child Development Center and an assortment of ethnic food samplings.

Colloquium and Sigma Series Lectures

Somerville On 'A Century Of Innovation'

Bob Somerville will present a Colloquium lecture titled "A Century of Innovation That Transformed Our Lives" at 2 p.m. Oct. 5 in Langley Research Center's Pearl Young Theatre. A Sigma Series lecture will follow at 7:30 p.m. at the Virginia Air & Space Center in Hampton.


Somerville

The Lecture

From 1900 to 2000, the world changed more than in any previous span of 100 years, perhaps more than it ever will again. Humans flew for the first time and even ventured into space. They talked across oceans, drove across continents and built calculating machines that worked miracles simply by processing zeros and ones. They reinvented farming, learned how to supply clean and safe drinking water and harnessed the very power of the atom. It was a century of firsts, and engineering was a part of it all.

Somerville, co-author of "A Century of Innovation: Twenty Engineering Achievements That Transformed Our Lives," reviews the 20 greatest engineering achievements of the 20th century, from electrification and health technologies to household appliances, the Internet, lasers, fiber optics and more. He describes the details, processes and serendipitous discoveries behind these achievements and tells the fascinating stories of the men and women — some well known, many unheralded — whose hard work and innovative thinking made it all possible. In little more than a lifetime, they transformed the world as never before, improved the lives of billions and launched the modern age.

The Speaker

Somerville graduated from Princeton University and later attended graduate school at Yale and the University of Virginia. He worked for 20 years at Time-Life, beginning as a proofreader and eventually becoming executive editor of the trade books division. He has written and edited books on a wide variety of subjects, including archaeology, astronomy, computers, flight, human physiology and psychology, American and world history and health. Now a freelance writer and editor based in Forest Heights, Md., Somerville is currently editing a history of a Trappist monastery, a how-to book on film editing and a legal thriller.

Future Lectures

■ **Nov. 2:** Neil deGrasse Tyson on "America's Future in Space and PBS NOVA Series 'Origins'"

■ **Dec. 7:** Robert Rose on "Fuel Cells: Hope or Hype?"

For more information about the lecture series, visit <http://shemesh.larc.nasa.gov/Lectures/> on the Internet.

16-Foot

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applied generally to a broad range of subsonic transports and military concepts.

The road to greatness

Wind tunnel testing played a major role in the resounding success of American aircraft during the World War I. With few exceptions, most U.S. fighters and bombers in the air and in development in the 1940s depended on air-cooled engines. Entering service as the 16-Foot High-Speed Tunnel, the Langley facility was perfect for solving the cooling problems being encountered with air-cooled engines.

The tunnel could duplicate subsonic, high-speed flight quickly and cheaply. Full-size engines were mounted in its test section and operated at various power levels while hundreds of thermocouples measured temperatures at crucial spots. When hot spots were discovered, the cowling and internal baffling could be modified on the spot. New tests could be run immediately, in contrast to lengthy and expensive flight tests. In addition, researchers improved the aerodynamic performance of high-speed propellers by using an electric dynamometer.

A noted historian and author once wrote that the wind tunnel dominated aeronautical research just as the microscope dominated biology, the telescope astronomy, and the particle accelerator nuclear physics. The legacy of the 16-Foot Transonic Tunnel upholds that concept.

After a decade, Langley was in the process of repowering the huge high-speed wind tunnel to boost airspeeds into the low-supersonic range. Since all supersonic aircraft would have to fly through the transonic range — at least briefly — knowing what happened in this transition zone was critical to fighters and bombers being planned in the post-war era. The opportunity to convert it into a transonic tunnel was seized immediately and the 16-Foot Transonic Tunnel was born. This major modification in 1950 increased tunnel capability to Mach 1.1 and added an octagonal slotted test section with a 60,000-hp drive system.

Yet another modification in 1961 added a compressor driven by a 36,000-hp motor and increased the Mach number to about 1.3. In 1990, new fan blades were installed and a new control room was added.

With each upgrade, the tunnel helped change the face of aviation and push the boundaries of space exploration. Breakthrough nozzle and thrust vectoring technologies were developed. In fact, the 16-Foot tunnel tested everything from high-speed propellers to the shapes of the first atomic weapons to today's scramjet-powered vehicles.

A noted historian and author once wrote that the wind tunnel dominated aeronautical research just as the microscope dominated biology, the telescope astronomy, and the particle accelerator nuclear physics. The legacy of the 16-Foot Transonic Tunnel upholds that concept.

Marny Skora is head of Langley's Public Affairs Office.

Day Of Caring

Charlene S. Farquharson of Langley's Personnel Operations Branch works at the Boy Scouts' Colonial Virginia Council.

200 Langley Employees Volunteer For Annual Event

Langley Research Center employees (left to right) Ava T. Bardusch, Lana P. Hicks-Olson and Kimberly L. Sheffler make the most of a painting assignment at the Mariners Museum in Newport News. Bardusch works in Langley's Dynamics and Control Branch; Hicks-Olson works in the Advanced Prototype Development Section; and Sheffler works in the Langley's Office of Procurement.

Photos by Jeff Caplan

John E. Lamar of Langley's Configuration Aerodynamics Branch works at the Menchville House.

Clifford J. Obara of Langley's Research Facilities Services Competency socializes with some volunteers from Wachovia at the Day Of Caring "after party" at Newport News City Center.

AdVentures

CLASSIFIED

FOR RENT: Waterfront apartment at the "Big House" in Wythe section of Hampton, at least four roommates needed, includes hot tub, pool, water, sewer, cable, Internet and view. Call 722-8083.

FOR SALE: 1996 18-foot Searay bowrider with 135-hp Mercruiser Alpha One I/O, galvanized Shorelander trailer, depth-finder, top, 40-plus mph but easy on gas, Never stored in water, all in excellent condition, $7,800. Call 599-4359.

FOR SALE: 1998 Saturn SL2, four door, five-speed manual, 58,000 miles, A/C, excellent condition, $4,400. Call 245-3214.

FOR SALE: 1994 Plymouth Grand Voyager conversion van, blue, 124,000 miles, 3.3L V6, 9-inch TV/VCP, quad seats, $2,750 or best offer. Call 224-3886.

FOR SALE: 1979 Ford F100 pick-up, all original, 300 ci. six cylinder, automatic, power steering, Alpine AM/FM/CD stereo, short bed with toolbox, 143,000 miles, $1,500 or best offer. Call 247-3060.

FOR SALE: Women's 14-ct. yellow gold, cluster diamond band, 1 ct. total weight, Size 9. Call 722-4525 or 652-8235.

FOR SALE: Wood table and four spindle-back chairs, 3x5 feet, natural finish, suitable for kitchen or informal dining room, $200. Call 816-4469.

FOR SALE: Two large metal footlockers, ideal for storage in flood-prone areas or for shipping, $25 each. Call 596-3897.

TO GIVE AWAY: Beautiful little one year old cat, black with a little white mixed in, large golden eyes. Call 865-0586.

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The deadline for the Oct. 8 edition is Sept. 27. Send submissions to <j.r.roberts@larc.nasa.gov>.

J-Lab Announces Fall Science Series

Jefferson Lab will host the following Fall Science Series events:

■ Kristine Larsen, professor of astronomy and physics at Central Connecticut State University, will present "The Astronomy of J.R.R. Tolkien's Middle-Earth" on **Oct. 4**.

■ Kristen Kulp, cancer research scientist with the Biology and Biotechnology Research Program at Lawrence Livermore National Laboratory, will present "What's for Dinner? Avoiding Toxins Lurking in Your Food" on **Nov. 23**.

Both presentations will take place at 7 p.m. in Jefferson Lab's CEBAF Center auditorium, located at 12000 Jefferson Ave. in Newport News. The presentations are free and open to the public. For security purposes, attendees are asked to enter at Jefferson Lab's main entrance on Onnes Drive.

For more information, call 269-5102 or visit: <http://education.jlab.org/scienceseries/currentseries.html>.

VASC Hosts 'NASA Days' Oct. 8-10

The Virginia Air & Space Center will host "NASA Appreciation Days" from **Oct. 8-10**. NASA employees and retirees will receive free admission to the museum and other benefits, including $10 off the purchase of a membership, a 20 percent discount in the Museum Store, and $20 off the price of a paver.

The VASC is Langley Research Center's official visitor center.

For more information, contact Jessica Wharton, Membership Coordinator, 727-0900, ext. 718.

Find Out 'Who Moved The Cheese' Oct. 14

Langley Research Center's Federal Women's Program (FWP) will host a "Strategies for Your Future" conference from 7:30 a.m. to 4:30 p.m. **Oct. 14** in the H.J.E. Reid Conference Center. The theme for the conference is "Reinvigorate, Refocus and Revolutionize!" Two learning tracks will be offered: professional development and personal effectiveness.

The guest speaker will be Patrick Grady, author of "Who Moved My Cheese?"

For more information or to register, visit: <http://oeop-r.larc.nasa.gov/fwp_conference/index.html>.

Blood Drive On Nov. 24

The American Red Cross will host its final Langley Research Center blood drive of the year on **Nov. 24** in the H.J.E. Reid Conference Center. Langley employees, contractors and retirees are invited to participate. Civil servants should charge their time to "Excused Leave."

For more information, contact Connie Small at 864-2564 or <Connie.J.Small@nasa.gov>.

New IMAX Film Opens At VASC

"Forces of Nature," a new IMAX film documenting earthquakes, tornadoes, volcanoes and other destructive natural forces, opened at the Virginia Air and Space Center in August. "Forces of Nature" is a National Geographic film, funded in part by the National Science Foundation.

For showtimes and advance tickets, call 727-0900, ext. 703 or visit the VASC web site at: <http:www.vasc.org>.

The VASC is Langley Research Center's official visitor center.

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