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Langley Research Center

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Center Hosts HQ Visits

Code T And Culture Change Staff Drop In On Consecutive Days



Michael DiFulvio (left), an employee in Langley Research Center's Aerothermodynamics Branch, shows a wind tunnel model to NASA Associate Administrator Craig Steidle (right) during a tour of the Center's space-related labs on May 25. Looking on are (left to right): Michael Lembeck, Director of the Office of Space Exploration's Requirements Division; Bobby Watkins, Assistant Associate Administrator for Exploration Systems; Mark Saunders, director of Langley's Space Access and Exploration Program Office; Roy D. Bridges Jr., Langley's Director; Cynthia Lee, Langley's Associate Director for Program Integration; and Jim Nehman, head of the Office of Space Exploration's Development Programs Division.

Photo by Jeff Caplan

Langley Touts Space Capabilities On May 25

By **JIM ROBERTS**
Researcher News editor

The managers of NASA's newly formed Office of Exploration Systems (Code T) visited Langley Research Center on May 25 to learn about the Center's past successes and the role it could play in the Vision for Space Exploration. There was, of course, talk of planned milestones — robotic and manned missions to the Moon, Mars and beyond extending to the year 2020 — but a simple question in the morning put it all in perspective.

"What if we found life?" asked Pat Troutman, a presenter from Langley's Spacecraft and Sensors Branch.

Craig Steidle offered an energetic response: "Wouldn't it be wonderful?"

Steidle, NASA's Associate Administrator (AA) for Exploration Systems, joined the Agency shortly before President George W. Bush outlined the Vision for Space Exploration on

■ **O'Keefe Applauds Congressional Support.** *Story on page 3.*

Jan. 14. Steidle's charge: to extend human presence across the solar system and beyond, but to do so in a way that is "sustainable and affordable." Although the search for life is not specifically laid out in the Vision for Space Exploration, it is a major tenet of NASA's Vision and Mission. To find life would be wonderful — to say the very least.

Steidle visited Langley with key members of his staff: Bobby Watkins, Assistant AA for Exploration Systems; Michael Lembeck, head of the Requirements Division; Jim Nehman, head of the Development Programs Division; and Dan Mabey, head of Business Operations Division. Douglas Cooke, Deputy AA for Exploration Systems, was at Johnson Space Center and could not attend.

The visit included presentations on Langley's capabilities in systems analysis; entry systems, including aerothermodynamics;

Continued on Page 3

Culture Change Topic Of May 26 Workshop

By **JIM ROBERTS**
Researcher News editor

Langley Research Center hosted a "Culture Change" workshop on May 26 in the H.J.E. Reid Conference Center.

Speakers at the two-hour workshop included Center Director Roy D. Bridges Jr.; James Jennings, NASA's Associate Deputy Administrator for Institutions and Asset Management; and Victor Lebacqz, NASA's Associate Administrator of the Office of Aeronautics; and NASA retiree Ed Kilgore.

Bridges opened the workshop by talking about the Agency's "wake-up call" following the Space Shuttle Columbia accident and investigation, the results of Safety and Mission Success Week and the creation of Langley's Kick Start Teams, notably the Culture Change Team.

He said small changes are already taking place at Langley. He cited the "lost time" signs, which now include contractors, and the Researcher News, which announced it will accept letters to the editor beginning in the May 21 edition. He also mentioned a new policy which allows employees to take a government car home the night before travelling.

Bridges said the small changes are symbolic of big changes on the horizon.

"We do have people up there [at Headquarters] who are aware, and we are working on these things,"

■ **Lebacqz Names Shin Deputy AA For Aeronautics.** *Story on page 3.*

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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

Around the Agency

MOON MAY SHED LIGHT ON EARTH'S CLIMATE

According to a new NASA-funded study, insights into Earth's climate may come from an unlikely place: the moon. Scientists looked at the ghostly glow of light reflected from Earth onto the moon's dark side. During the 1980s and 1990s, Earth bounced less sunlight out to space. The trend reversed during the past three years, as the Earth appears to reflect more light toward space.

Though not fully understood, the shifts may indicate a natural variability of clouds, which can reflect the sun's heat and light away from Earth. The apparent change in the amount of sunlight reaching Earth in the 1980s and 1990s is comparable to taking the effects of greenhouse gas warming since 1850 and doubling them. Increased reflectance since 2001 suggests change of a similar magnitude in the opposite direction.

For information about this research on the Internet, visit: <http://www.gsfc.nasa.gov/topstory/2004/0528earthshine.html>.
RELEASE: 04-170

FIRST COLUMBIA DEBRIS LOANED FOR RESEARCH

The first pieces of Space Shuttle Columbia debris loaned to a non-governmental agency for testing and research are on their way to The Aerospace Corp. in El Segundo, Calif.

The Aerospace Corp. requested and will receive graphite/epoxy honeycomb skins from an Orbital Maneuvering System pod, Main Propulsion System Helium tanks, a Reaction Control System Helium tank and a Power Reactant Storage Distribution system tank. The company will use the parts to study re-entry effects on composite materials. NASA notified the Columbia crew's families about the loan before releasing the items for study. RELEASE: 04-165

NASA PLANS TO PUT AURA AROUND THE EARTH

On June 19, NASA will launch Aura, a next generation Earth-observing satellite. Aura will supply the best information yet about the health of Earth's atmosphere.

Aura will help scientists understand how atmospheric composition affects and responds to Earth's changing climate. The satellite will help reveal the processes that connect local and global air quality. It will also track the extent Earth's protective ozone layer is recovering.

Aura will carry four instruments, each designed to survey different aspects of Earth's atmosphere. The instruments will provide an unprecedented and complete picture of the composition of the atmosphere. Aura will survey the atmosphere from the troposphere, where mankind lives, through the stratosphere, where the ozone layer resides and protects life on Earth.

For Aura information on the Internet, visit: <http://www.gsfc.nasa.gov/topstory/2004/0517aura.html>.
RELEASE: 04-158

News Researcher

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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 200 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>>.



Attendees at Langley Research Center's Speakers Bureau recognition ceremony included (left to right) Yolanda Hinton, Karen Credeur, Michael Uenking, Donner Grigsby, Larry Cooper, Tom Yager, Jane Hogge, Keith Henry, Center Director Roy D. Bridges Jr., Dick Davis, Myra Walton-Basnigh, Grayson Williams, Joan Lehman and Elaine Gause.

Photo by Sandie Gibbs

Speakers Bureau Honors Volunteers

Langley Research Center's Speakers Bureau hosted its annual volunteer recognition ceremony on May 20 in the H.J.E. Conference Center. Center Director **Roy D. Bridges Jr.** was on-hand to present awards.

Speakers Bureau volunteers play a critical role in communicating NASA's Vision and Mission to community, state, national, academic and professional groups. In 2003, 72 speakers gave 200 talks to more than 15,800 stakeholders. **Michael D.**

Uenking was named 2003 Speaker of the Year for presenting 22 talks to an audience of 1,040 stakeholders.

The keynote speaker for the ceremony was Grayson Williams, retired executive of Sears, Roebuck and Co. and vice president of the Peninsula Toastmasters and Oyster Point Speakers. Williams' humorous address, "I Was Almost A Speaker That Never Was," offered employees tips on using body language in their speech.

Trippe Earns Superior Accomplishment Award

Langley Research Center employee **Barbara S. Trippe** received a Superior Accomplishment Award on May 10. Center Director Roy D. Bridges Jr. presented the award for her "selfless response



Trippe

in giving assistance to a co-worker in need without regard to her own safety or well-being."

On April 7, a 14-inch water main ruptured outside Bldg. 1244, Langley's hangar complex. Trippe, an employee in Langley's Flight Research Services Competency, noticed a construction worker trapped and immediately ran to render assistance as another worker pulled the worker from the hole. She helped to carry him to safety from the danger zone, which included possible electrocution hazard.

"Trippe acted instinctively without thought to her own safety or well-being," **Steve Reznick**, head of the Flight Research Services Competency, wrote in Trippe's award justification. "Her immediate and selfless response to give assistance to a co-worker speaks very highly of her and of her dedication to the NASA Langley community."

been tremendous and the contributions to Kristin's cause, the Women's Resource Center to End Domestic Violence, has been most generous. We are grateful to you all. May God bless you and your loved ones."

Lisa and Jim Yu

In Memoriam

Louis M. Cannon

Louis Mann Cannon died on May 19 at the age of 78. Cannon, a native of Newberry, S.C., worked as a carpenter for Klate Holt Construction Co. on contract to NASA for more than 20 years.

Horace W. Jones

Horace W. Jones died on May 23 at the age of 81. Jones, a native of Richmond, served in the U.S. Navy and was a veteran of World War II. He went on to graduate from the Newport News Shipyard Apprentice School and worked as a machinist at NASA until his retirement.

Joseph S. Stodghill

Joseph Stanley Stodghill died on May 22 at the age of 87. Stodghill, a native of Aurora, Ind., served in the U.S. Navy and was a veteran of World War II. He went on to work for NASA, retiring from Langley Research Center after 26 years of service.

Ralph L. Wingrove Sr.

Ralph L. Wingrove Sr. died on May 23 at the age of 81. Wingrove served in the U.S. Army Air Corps and flew numerous combat missions as a B-24 pilot during World War II. He went on to work for NASA, retiring from Langley Research Center after 30 years of service.

Letter

"We want to thank our Langley family for your expressions of sympathy and encouragement after the tragic passing of our beloved daughter, Kristin, on May 1, 2004. The outpouring of support has

Space

Continued from Page 1

remote-sensing and lidar/laser instruments; and space structural systems. The visit also included tours of Langley facilities, including the Collaborative Engineering Center, the 31-Inch Mach 10 Wind Tunnel and the Large Space Structures Lab. The theme was consistent: Langley has been successful in the past, and Langley can help the Office of Exploration Systems succeed in the future.

During an all-hands meeting in the afternoon, Steidle said he was already well aware of Langley's capabilities, thanks to his career in the U.S. Navy — notably as leader of the F-18 and Joint Strike Fighter programs — and his master's work at Virginia Tech. But he admitted there was a lot he didn't know.

"I needed to get down here to see," Steidle told employees. "We're depending on you all."

In a question-and-answer session, Steidle also told employees that Congressional support for the Vision for

Space Exploration is growing. "Two months ago, the response was very cynical," he said. "About a month ago, I saw a turnaround. Two weeks ago, it started to change. I've seen a change in attitude that I see as positive."

The visit ended with a presentation about the NASA Engineering and Safety Center (NESC), which has been running at Langley since October 2003. Ralph

Roe described the NESC as a robust organization that can provide "value added" independent assessment where it is needed most.

"We think we have a great resource for you to use," Roe said. He also told Steidle he would like to incorporate a chief engineer from the Office of Exploration Systems into his staff.

Roe's presentation ended with another theme that was consistent throughout the day: "We stand ready to help."

Langley Center Director Roy D. Bridges Jr. echoed the thought at the conclusion of the all-hands meeting. "I can tell them you will deliver," he said. "This is an exciting time to be alive. Just be thankful you have an opportunity to participate."

adoption by the House of Representatives, on May 19, of the Conference Report.

"The funding level for Function 250 will accommodate the President's FY 2005 budget request for NASA and funding of the Vision for Space Exploration in forthcoming action by the Committees on Appropriations.

"House and Senate managers for the Budget Resolution recognized the criticality of funding for NASA in the Joint Explanatory Statement of the Committee of Conference: 'The conferees support the President's Vision for Space Exploration and believe the fiscal year 2005 funding for Function 250 should provide sufficient funding to initiate the process.

Additionally, the bulk of the requested

Change

Continued from Page 1

Bridges said. "Leadership is really working for you, doing everything they can to try to make things better."

Jennings talked about implementing culture change based on results of the Agency's Behavioral Science Technology (BST) survey. He quieted skeptics, saying change will take place because individuals have been assigned to each action in the plan, and they will be accountable to a review headed by NASA Deputy Administrator Fred Gregory.

"If we look back years from now, we actually will see things got done," he said.

Lebacqz highlighted the values presentation from his March visit and said NASA Administrator Sean O'Keefe will unveil a set of Agency-wide values on June 3. He also said a key to change is acknowledging that "we" are the problem, not "them."

"It's all of us," Lebacqz said. "Not 'them.' You're a part of us; we're a part

of you. Problems won't get solved if it's always 'them.'"

Kilgore, who worked for NASA for 44 years, many at Langley, drew laughs from the Reid Center crowd with his historical perspective, most notably a story about how the National Advisory Committee for Aeronautics used to be run by a committee that met once a year.

"Can you imagine today if you had a Headquarters that met once and went away?" he asked. "The other thing we had was very little bureaucracy."

Kilgore expressed excitement about NASA's Vision for Space Exploration but suggested that the Agency focus on developing new technologies, not mission-specific objectives.

"If you really want to change the culture, this is the way to do it," he said. "Our

major concern is research and technology."

The session ended with questions from employees. Topics ranged from Center competition in a One NASA environment to a reorganization at Headquarters.

In one answer, Lebacqz offered a call to action: "There's a lot of talking the talk; we're not walking the walk."

"We do have people up there who are aware, and we are working on these things. Leadership is really working for you, doing everything they can to try to make things better."

Roy D. Bridges Jr.

O'Keefe Applauds Congressional Support

By **MICHAEL BRAUKUS**
NASA Headquarters

NASA Administrator Sean O'Keefe applauded a May 25 Congressional Conference Agreement that supported the President's Vision for Space Exploration. The Conference Agreement for General Science, Space and Technology announced support for the Vision and committed to providing sufficient funding during fiscal year 2005 to initiate it.

"I am extremely pleased by the achievement last week of a House/Senate Conference Agreement on the FY 2005 Budget Resolution," O'Keefe said. "It provides a total of \$23.9 billion in budget authority for Function 250, General Science, Technology and Space, and the

increase for fiscal year 2005 is for Return to Flight of the Space Shuttle and continued assembly and operations for the International Space Station. The conferees hope that these two must-fund requirements will be taken into account during the consideration of the NASA appropriation."

"This FY 2005 Conference Agreement is the culmination of hard work in Committee, House and Senate floor action, and, finally, weeks of Conference effort, led by Senate Chairman Don Nickles (R-OK) and House Chairman Jim Nussle (R-IA). The Chairmen were supported, in particular, by the efforts of Senators Jeff Sessions (R-Ala.) and Bill Nelson (D-Fla.)

"I look forward to the Senate taking up

the Agreement following the current Congressional work period. The Conference Agreement on the Budget Resolution represents the critical first step in establishing an overall budget plan to guide subsequent action by the Committees on Appropriations, and now permits the setting of 302(b) allocations for Appropriations Subcommittees within which FY 2005 appropriations bills will be constructed."

The president requested a budget increase for 2005 that begins the stepping-stone approach to space exploration he announced in January. The bulk of the increase in the coming fiscal year will support Space Shuttle return to flight efforts and continued assembly and operations of the International Space Station.

receiving a doctorate in mechanical engineering from Virginia Tech. He received a bachelor's degree from Yonsei University, Korea, and a master's in mechanical engineering is from California State University, Long Beach. He is also a graduate of Harvard University's Senior Executive Fellowship Program.

He has received a NASA Exceptional Service Medal, a NASA Group Achievement Award, the Air Force Team Award and four individual and group awards from Lewis (now Glenn) Research Center.

Lebacqz Names Shin Deputy AA For Aeronautics

By **MICHAEL BRAUKUS**
NASA Headquarters

Victor Lebacqz, NASA's Associate Administrator of the Office of Aeronautics, has selected Jaiwon Shin as his Deputy Associate Administrator (DAA).

The Office of Aeronautics was created in January to reflect NASA's commitment to aviation research and aeronautics technologies for the nation's civil and defense interests. Shin will assist with technical, programmatic and personnel management

of NASA's aeronautics research and development.

"I am very excited about the addition of Dr. Shin to the Office of Aeronautics team," Lebacqz said. "His experience and skills will be critical as we begin designing aircraft to fly on other planets, explore the boundaries of supersonic and hypersonic flight, and transform the national air transportation system in partnership with other government agencies, industry and universities."



Shin

Shin was chief of the Aeronautics Projects Office at Glenn Research Center prior to his selection. Shin served as chief of Glenn's Aviation Safety Program Office and was deputy program manager for NASA's Aviation Safety Program and Airspace Systems Program. He assisted managers at Ames Research Center and Langley Research Center with program-wide aeronautics advocacy, planning and research.

Shin joined NASA in 1989 after

receiving a doctorate in mechanical engineering from Virginia Tech. He received a bachelor's degree from Yonsei University, Korea, and a master's in mechanical engineering is from California State University, Long Beach. He is also a graduate of Harvard University's Senior Executive Fellowship Program.

He has received a NASA Exceptional Service Medal, a NASA Group Achievement Award, the Air Force Team Award and four individual and group awards from Lewis (now Glenn) Research Center.

Bridges Leads Explorer School Visit

By **KIMBERLY LAND**
Planners Collaborative, Inc.

Langley Research Center Director Roy D. Bridges Jr. visited Mount View Middle School in Welch, W.Va., on May 21 to share NASA's Vision for Space Exploration with the next generation of explorers. Bridges was accompanied by NASA Astronaut Steven Swanson and NASA's White House Liaison, J.T. Jezierski.

The visit was part of NASA's Explorer School Program. Bridges spoke with the Mount View students about America's heritage as explorers. But his visit was more than a glamorous show-and-tell session — it was a recruitment effort.

Bridges shared his belief that anything is possible. "If you can dream it," he said, "you can achieve it." He told the students they will be the ones to take NASA to plateaus never seen by humankind.

"I grew up in a small town like you all," he said, "but I was inspired by the enormous dream of going up to space. I was excited by our nation's discovery of space."

Bridges, a former Air Force test pilot and NASA Astronaut, was named



Langley Research Center Director Roy D. Bridges Jr. signs posters at Mount View Middle School in Welch, W.Va., on May 21. Bridges has visited four schools this year and will visit five more as part of the NASA Explorer School Program.

Photo by Jeff Caplan

Director of Langley in August 2003. He is responsible for the Center's aeronautical and space research programs, as well as facilities, personnel and administration. He is also an advisor to the NASA

Administrator on Agency programs.

"You all will have to carry on NASA's legacy of space exploration," Bridges told students after outlining NASA's plans to return to the moon and send humans to

Mars. "NASA is serious about encouraging our future explorers."

Over the past few years, NASA has partnered with more than 100 schools throughout the country to form "Explorer Schools." Schools in the program are designed to cultivate the next generation of space travelers. Teachers at the schools meet regularly and attend training at NASA facilities, and NASA personnel keep in close contact with the Explorer Schools.

Mount View Middle School is the first school in West Virginia to be chosen as an Explorer School. The school is participating in a three-year partnership with NASA. Stimulating student imaginations and creativity via NASA discoveries, the partnership hopes to inspire young people in West Virginia and other rural areas across the country by helping them pursue careers in science, technology and engineering.

For information about the Explorer Schools Program, visit: <http://explorerschools.nasa.gov>.

Kimberly Land works for Planners Collaborative, Inc. in support of Langley's Office of External Affairs.

GWU Continues Winning Tradition

Students Win AIAA Awards

By **JESSIE COATES**
George Washington University

Christopher Brunner, a student at George Washington University (GWU) at Langley Research Center, placed first in the graduate paper and presentation competition at the American Institute for Aeronautics and Astronautics (AIAA) 2004 Mid-Atlantic Region I Student Conference.

It is the ninth time in the last 17 conferences that a GWU student has claimed first place in the graduate division.

Brunner's paper and presentation were titled "Conceptual Design of a Communications Relay Satellite for a Lunar Sample Return Mission." Brunner will advance to the national competition in Reno, Nev., in January 2005.

The annual conference, held this year in April at Virginia Tech, provides a venue for AIAA student members to present their research. Participants submit technical papers in advance and give formal presentations to the conference attendees.

Participating schools, in addition to GWU and Virginia Tech, included Old Dominion University, Penn State University, the University of Maryland, the University of Pittsburgh, the University of Virginia and West Virginia University. More than 100 students, faculty and AIAA professional members attended the conference.

In addition to Brunner's award, GWU's AIAA student branch was awarded the title of "Best Student Branch" for the previous academic year.



George Washington University (GWU) professor Andrew Cutler (right) poses with members of the award-winning GWU student branch of the American Institute for Aeronautics and Astronautics (AIAA): Dulnath Wijayratne, Michael Theriot and Christopher Brunner.

Photo by Jeff Caplan

O'Keefe Featured On 'NASA CONNECT'

By **CHRIS GIERSCH**
Langley Research Center

NASA Administrator Sean O'Keefe was featured on a "NASA CONNECT" program that aired May 20 on PBS stations throughout the country.

The episode, titled "The 'A' Train Express," explains how weather affects people's daily lives and features two NASA missions: CloudSat and CALIPSO. In the introduction, O'Keefe emphasizes the importance of parental involve-

ment in a child's education.

"NASA CONNECT" lets viewers experience the exciting and important work that engineers, scientists and technicians do every day — work that's about the future and for which you, our next generation, will have the opportunity to pick up and carry to new heights and possibly to other planets," O'Keefe said in the program. "There are many hands-on and web-based activities from 'NASA CONNECT' that the family can do together at home. I encourage you to

learn more about those activities in today's program."

The program features students at Belmont Ridge Middle School in Leesburg, Va., including O'Keefe's two sons.

"NASA CONNECT" is a research-, inquiry- and standards-based, Emmy Award-winning instructional education program for grades 6-8 that integrates mathematics, science and technology. "NASA CONNECT" is produced by Langley Research Center's Center for

Distance Learning.

By conducting inquiry-based and web activities, students will make connections between NASA research and the mathematics, science and technology they learn in their classrooms.

■ For more information, visit the "NASA CONNECT" web site: <http://connect.larc.nasa.gov>.

Chris Giersch works in Langley's Office of Education.

'Hallmarks of Success'

Looking Into A Crystal Ball

Montana Company Uses SBIR Funding To Support Laser Research

By SHERI BEAM
Langley Research Center

Editor's note: How does a small, high-tech business become a success? It's not an exact science, because success comes in many different forms. This is the third in a series of articles about small, high-tech, high-risk companies that have partnered with NASA through the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs. Each one is different — different sizes, different locations, different technologies — yet all have become successful and are considered to be "Hallmarks of Success."

A small company that develops experimental crystals appears to have its own crystal ball. Since the 1980s, Scientific Materials Corporation (SMC) in Bozeman, Mont., has been in the business of growing crystals. Because developing the crystals actually leads the device development by roughly seven years, the company has to peer into the future at potential destinations for their crystals.

The firm's crystals are being used in many areas of research and development to create new high-performance, solid-state devices in the field of optoelectronics.

Why would a crystal-growing company locate in Montana? It so happens that the climate is ideal, and crystal-growing relies on stability.

"What you're trying to create is an atmosphere around your pot that is extremely stable, that has no outside interference, and you just let the thing essentially cook," said Ralph Hutcheson, company founder. "You want Mother Nature to work with you, not against you."

During the growing process, it is also much easier to work with cold temperatures than hot temperatures.

Early in the company's history, Hutcheson attended a presentation given by a NASA expert who discussed the need for lasers in space. As he sat in the audience, he thought, "I can do



Langley Research Center uses experimental crystals developed by Scientific Materials Corporation in Bozeman, Mont., for various laser applications.

NASA photo

that." And he did. With funding from Langley Research Center through a Small Business Innovation Research (SBIR) contract, the firm developed some crystal samples that have been used as optoelectronic components in space-based lasers.

In the early 1990s, a resurgence in the field of solid-state laser technology occurred, as people realized that lasers could be the solutions for many approaching technology needs.

There was a renewed focus on high-energy programs, growth in military applications, such as target identification and target illumination, and an explosion in the use of medical lasers for surgery and treatment.

Langley was part of that resurgence, particularly in the area of remote-sensing applications for the space-based lasers,

such as ozone and water vapor measurements.

All of those applications pushed the technology development to new and higher levels, and because SMC had been looking ahead, they were ready.

"In the last 10 years, solid-state lasers have been moving from infancy to adolescence, as far as their applications are concerned," Hutcheson said. "Not at adulthood yet, but slowly getting there."

Using that "crystal ball" to see the future needs for their crystals, SMC knew two things had to happen: "Their quality had to be improved, and the prices had to become lower."

The company has done both. The net result is what Hutcheson calls the "Experimental Crystals Supermarket" at Scientific Materials. For any study requiring a crystal sample, there are

numerous concentration variations of the required samples for the experiments—as many as 20 to 40 samples at far lower costs than 10 years ago. Today, a researcher can go "shopping" to find just right crystal to meet project needs.

Not too long ago, Keith E. Murray, a researcher in Langley's Laser and Electro-Optics Branch wanted to develop a two-wavelength laser system for dental and medical applications. However, he had a very limited budget and needed to have the best candidate materials for true proof-of-principle demonstrations. SMC took an interest in Murray's project and provided his required crystals at a fraction of what they might have otherwise cost.

Early on, SMC developed a close working relationship with Montana State University, also

located in Bozeman. The firm is able to tap into the university community as it develops new products, and at the same time, it provides the professors and students with quality crystals for university research and development projects.

Hutcheson considers the relationship to be mutually beneficial. "The university found in the process of doing this, it actually broadened their education capabilities, and they brought a whole new level of activities to the students," he said.

The company is recognized worldwide for the fine, high-quality crystal samples it produces. Its largest commercial product, Nd:YAG, is the result of their research efforts under the SBIR program with Langley. Because of the intense beam it helps to produce in lasers, Nd:YAG is the workhorse of the crystals and is used in all types of machining processes.

SMC also has developed laser media and switches that are currently in the Geoscience Laser Altimeter System (GLAS). GLAS is on-board the Ice Cloud and Elevation Satellite (ICESat) spacecraft, where it is measuring ice-sheet topography, cloud and atmospheric properties, and the height and thickness of radiatively important cloud layers needed for accurate short term climate and weather prediction. GLAS is the first laser-ranging (lidar) instrument for continuous global observations of Earth.

SMC crystal samples are being developed for several other major applications, including a monoblock laser for U. S. Army range finder applications; a memory processor chip that will be capable of reducing huge amounts of data and then collating it very rapidly; and new high energy optics for high energy lasers.

While these and other projects are in development today, SMC continues to look into that crystal ball to see what will be needed tomorrow.

Sheri Beam is in charge of marketing and media relations for Langley's Small Business Partnership Team.

"In the last 10 years, solid-state lasers have been moving from infancy to adolescence, as far as their applications are concerned. Not at adulthood yet, but slowly getting there."

Ralph Hutcheson

CLASSIFIED

FOR SALE: 1993 Buick LeSabre, 6 cylinder, four-door, 102,000 miles, grey, one owner, excellent condition, \$4,000. Call 826-3684.

FOR SALE: 29-inch television, \$125; vacuum cleaner, \$60; office desk and hutch, \$30; microwave oven, \$25; three chests of drawers, \$20 each; other small appliances and kitchenware; most items less than 2 years old. Call 593-0723.

FOR SALE: Twin-size bed frame, \$20; brand-new terry cloth robe, still in package, \$10. Call (407) 252-5368 (cell).

CLASS OFFERED: Algebra course offered for middle- and high-school students during the evenings this summer. Call 826-2377.



The deadline for the June 18 edition is June 7. Send submissions to <j.r.roberts@larc.nasa.gov>.

J-Lab Hosting Summer Physics Fests

Jefferson Lab will host "Summer Physics Fests" from 10 a.m. to noon **June 9, June 30, July 28, Aug. 11** and **Aug. 25** in the CEBAF Center auditorium in Newport News.

The "Physics Fests," designed for families and student groups, include an interactive summary of the research conducted at the Jefferson Lab followed by the popular "Deep Freeze" and "Hot Stuff" presentations.

The presentations are free and open to the public, but reservations are required.

For reservations or more information, contact Stacy Ring at 269-7560 or <ring@jlab.org>.

Special Activities Planned At VAM

The Virginia Aviation Museum (VAM) will host the following activities in June:

■ "Air Fair," a day of special activities for the family, will take place from 9:30 a.m. to 5 p.m. **June 19**.

■ "Aviation Mondays," a series of discussions and activities for elementary school students, will be offered from 9:30 to 10:30 a.m. and from 11 a.m. to noon on **June 21** and **28**.

■ "Introduction to Aviation," a two-day study of aerodynamics, navigation, instrumentation and the basics of flight for children between the ages 10 and 17, will be offered from 9:30 a.m. to 12:30 p.m. on **June 30** and **July 1**. There is a fee for this activity, and pre-registration is required.

The VAM, located at Richmond International Airport, is open from 9:30 a.m. to 5 p.m. Monday through Saturday and from noon to 5 p.m. Sunday.

Researcher Now Available In PDF

The Researcher News is now available in portable document format (pdf) format on the Researcher News web site: <<http://researchernews.larc.nasa.gov>>. The pdf file, like the hard copy, is tabloid-size (11 inches wide by 17 inches tall) but can be scaled to fit on a standard printer. Adobe Reader is required to view the file. It can be downloaded for free at: <<http://www.adobe.com/products/acrobat/readstep2.html>>.



For more information, call 804-236-3622 or visit <<http://vam.smv.org>> on the Internet.

Space Camp Offered At Wallops

The Virginia Space Flight Academy will host nine Space Flight Adventure Camp sessions this summer. The weeklong camps for boys and girls between the ages 12 and 15 will be offered from **June 20** through **Aug. 15** at NASA's Wallops Flight Facility on the Eastern Shore of Virginia.

Tuition is \$595, which includes double-

occupancy housing, meals, transportation while at camp, a workbook, a T-shirt and all instructional materials.

For more information, call 866-757-7223, e-mail <spaceacademy@intercom.net> or visit the Virginia Space Flight Academy web site: <<http://www.VaSpaceFlightAcademy.org>>.

Blood Drive On July 14

The American Red Cross will host a blood drive on **July 14** in Langley Research Center's H.J.E. Reid Conference Center. Langley employees, contractors and retirees are invited to participate. Civil servants should charge their time to "Excused Leave."

Future blood drives are scheduled on **Sept. 15** and **Nov. 24**.

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

'Aero' Art Show Moves To D.C.

The "Aerospace Design" art show that was featured last year at the Art Institute of Chicago has moved to the Octagon Museum in Washington, D.C., and will remain on display through **Dec. 5**.

The exhibit, subtitled "The Art of Engineering from NASA's Aeronautical Research," explores the power and beauty of aerospace design, from early wind tunnel models to modern aeronautical engineering. It features 65 NASA artifacts, including many from Langley Research Center.

The Octagon Museum is open from 10 a.m. to 4 p.m. Tuesday through Sunday. For more information, visit: <<http://www.archfoundation.org/octagon/>>.

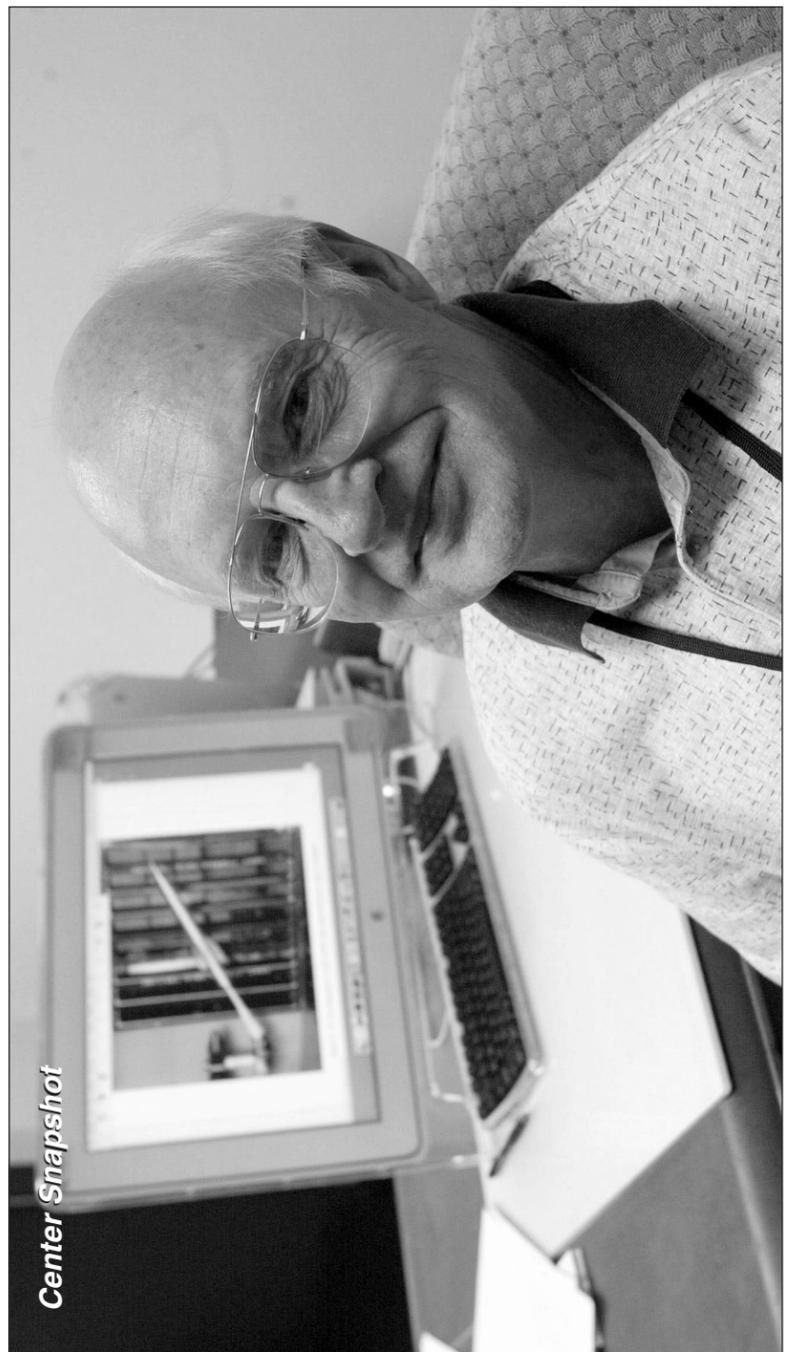
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Center Snapshot

Jerry Allen, an employee in Langley Research Center's Configuration Aerodynamics Branch, will retire on July 2 after more than 41 years of service. Most of his career was dedicated to researching the aerodynamics of missiles in Langley's Unitary Tunnel. One of the tests he worked on was the development of the Patriot missile. Born in Forest City, N.C., Allen now resides in Newport News with his wife. They plan to buy a vacation home at Lake Caroline. What has he liked about working at Langley? "I like doing research work," he says. Photo by Jeff Caplan