

National Aeronautics and  
Space Administration  
Langley Research Center

# News Researcher

Biweekly Employee and Contractor Publication

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# Making History X-43A Soars to Success

By **KEITH HENRY**  
Langley Research Center

EDWARDS, Calif.—Even though NASA's Hyper-X team had made it look easy in March, no one at Langley Research Center or Dryden Flight Research Center was taking the third and final flight of the X-43A for granted Nov. 16.

As the clock ticked toward launch, dozens of Langley team members were huddled with heightened intensity in Hampton, Va., while a smaller Langley contingent watched nervously from a control room with their colleagues at Dryden.

After all, flying a scramjet-powered airplane at nearly Mach 10 — or 10 times the speed of sound — was even more challenging than the record-breaking Mach 7 flight earlier in the year. At Mach 10, more was being asked of the scramjet engine. At Mach 10, a clean separation of the X-43A research vehicle from the nose of the booster rocket was even more challenging. At Mach 10, peak surface heating would be almost double.

"5, 4, 3, 2, 1— launch, launch, launch!" commanded Brad Neal aboard the B-52B carrier aircraft.

This was it. The culmination of the eight-year, \$230 million Hyper-X program would either end ignominiously or demonstrate, for the first time ever, the promise of scramjet flight on an airplane

## Langley's Contributions

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### News Release & Flight Details

<http://researchernews.larc.nasa.gov>

flying almost 7,000 mph.

The launch "stack" dropped from the right wing of the much-larger B-52B, the booster fired and shot itself and the unpiloted X-43A research vehicle from the 40,000-foot altitude of the B-52B to test altitude of about 110,000 feet in about 90 seconds. Moments later, the 12-foot-long research vehicle was pushed forward, clear of the booster rocket, by two small explosively charged pistons.

"Cowl door open," observed a highly professional voice from the main control room. Grins all around. The scramjet— or supersonic combustion ramjet — was working. Only seconds later, "Cowl door closed." The grins became uncontrollable smiles. The scramjet had fired and apparently worked perfectly for a full 10 seconds, as planned.

Ten seconds? Yes, all of this for 10 glorious seconds of Mach 10 scramjet flight. Wind-tunnel tests had been instrumental in proving the scramjet concept and instrumental in making the flight possible. At the same time, because of limited tunnel capacity at Mach 10, the total



NASA PHOTO

For the first few moments following its release from the B-52B, the Pegasus rocket, with X-43A attached, drop and glide before igniting the engine to accelerate.

See **SCRAMJET** on Page 3

## O'Keefe Applauds Multi-Center Accomplishment

The NASA Family was made particularly proud Nov. 16 as we watched our Hyper-X Program team's X-43A research vehicle scream into the sky to break its own record, successfully demonstrating that its air-breathing scramjet engine can fly at nearly 10 times the speed of sound.

Led by Associate Administrator for Aeronautics Research Vic Lebacqz, the Vehicle Systems team from Langley Research Center, Dryden Flight Research

Center and our industry partners deserve high praise for accomplishing a major success for our agency. This historic achievement in hypersonic airbreathing propulsion opens a completely new chapter in aerospace with applications to commercial aviation and, ultimately, space access in the years to come.

The flight promises more airplane-like operations for affordable, flexible and safer ultra high-speed flight in the atmosphere and for the first stage to Earth orbit.

These developments will also advance the Vision for Space Exploration, while helping to advance commercial aviation technology.

Please join me in celebrating this successful flight and the work of the Hyper-X Program team, and let it remind us of the extraordinary work that the men and women of this agency do every day, as only NASA can.

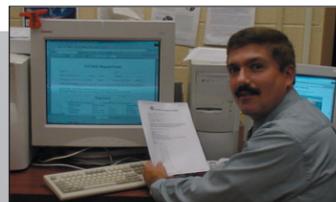
—Sean O'Keefe, NASA Administrator

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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

### SWIFT SATELLITE SUCCESSFULLY LAUNCHED

NASA's Swift satellite was successfully launched Nov. 20 from the Cape Canaveral Air Force Station, Fla. The satellite will pinpoint the location of distant yet fleeting explosions that appear to signal the births of black holes.

"It's a thrill that Swift is in orbit. We expect to detect and analyze more than 100 gamma-ray bursts a year. These are the most powerful explosions in the universe, and I can't wait to learn more about them," said Swift Principal Investigator Dr. Neil Gehrels, at Goddard Space Flight Center.

Each gamma-ray burst is a short-lived event, lasting only a few milliseconds to a few minutes, never to appear again. They occur several times daily somewhere in the universe, and Swift should detect several weekly. For more information, visit: <http://www.nasa.gov/swift&http://swift.gsfc.nasa.gov>.

RELEASE: 04-382

### HUMAN, ROBOTIC PROGRAMS SUPPORT VISION

Members of NASA's human and robotic programs are cooperating in new ways to support the Vision for Space Exploration. The Vision calls for a "building block" strategy of human and robotic missions to reach new exploration goals. The first step in the Vision is returning the Space Shuttle safely to flight.

To that end, managers from the Jet Propulsion Laboratory (JPL), who directed the Mars Exploration Rover missions, are sharing their experience and insight with managers from the Space Shuttle Program. In November, those JPL managers took part in a four-day practice session, their longest simulation thus far, by Shuttle mission managers at Johnson Space Center. The practice exercised the team's capability to provide timely and appropriate evaluation and input on issues that arose throughout the simulation. For more information, visit:

<http://www.nasa.gov/returntoflight>. RELEASE: 04-381

### SBIR AND TECHNOLOGY PROJECTS SELECTED

NASA has selected 290 Small Business Innovation Research (SBIR) and 40 Small Business Technology Transfer (STTR) research proposals for Phase 1 contract negotiations. The selected SBIR projects have a total value of approximately \$20.2 million and the STTR projects have a total value of approximately \$4 million.

The SBIR contracts will be awarded to 219 small high-technology firms in 36 states. The STTR contracts will be awarded to 39 small high-technology firms in 17 states.

NASA evaluated 2,149 SBIR proposals and 119 STTR proposals submitted by U.S.-owned small business concerns. Selected proposals may receive up to \$70,000 for an SBIR contract and up to \$100,000 for an STTR contract. For more information, visit: <http://sbir.nasa.gov>. RELEASE: 04-379

## NESC Award Recognition



PHOTO BY JEFF CAPLAN

For substantial contributions made to accomplish the mission of NASA's Engineering and Safety Center (NESC), (from left) Scott Willard (Research & Technology Directorate), Thomas Howard (Research & Technology Directorate) and John Newman (Research & Technology Directorate) received the NESC Group Achievement Award. They were "honored for their exemplary contributions developing an edge replication method to inspect slots for surface defects and fatigue cracks in the main propulsion system of the Space Shuttle Orbiter." Along with Willard, Howard and Newman, 110 other Langley Research Center employees received recognition awards for their contributions to the NESC.

## Be an "Angel" this Winter

By PAM VERNIEL  
Langley Research Center

The 2004 Angel Tree Program is ready for your help!

Langley Research Center employees are invited to participate in The Salvation Army program, which delivers donated gifts of new clothing—shoes, dresses, pants, shirts, sweaters, coats, toys and other gifts—to needy children. Last year, 4,631 Peninsula children were helped.

Here's how to participate:

1. Choose one or more of the 40 "Angel Tags" from the Angel Tree located in the Reid Conference Center. Each tag carries information about what is needed and the first name, age and size of a needy child.

2. Write your name and phone number on the sign-up sheets by the tree.

3. Purchase the items shown on the tag.

4. Do not remove price tags and do not wrap the items. Place all the items for each child in a bag by the tree. Attach the Angel Tag to the bag.

5. Place the gift under the Angel Tree by Dec. 14.

6. Gifts will be delivered to The Salvation Army on Dec. 15. These easy steps will bring much joy to children in need of new clothing and toys.

If you have any questions, call 864-2449.

*Pam Verniel works in the Public Outreach Office at Langley Research Center.*

## IN MEMORIAM

### Willie Kearney Jr.

Willie Kearney Jr., 83, died Nov. 7. He retired with 45 years of service as a civil service worker at Fort Monroe. He also retired as a part-time worker from Langley Research Center. Kearney was a WWII veteran where he served in Europe and the South Pacific.

### Phyllis A. Fautleroy Owens

Phyllis A. Fautleroy Owens, 57, died Nov. 3. A native of Newport News, she worked for ARC, a NASA contractor, as an administrative assistant for 25 years.

### Paul Calvin Stainback

Paul Calvin Stainback, 78, died Nov. 2. A retired scientist from NASA, Stainback also served in the U.S. Navy in WWII.

### Robert Jeffrey Wallis

Robert "Bobby" Jeffrey Wallis, 49, died Nov. 14. A native of Newport News, Wallis graduated with a degree in civil engineering from Virginia Tech in 1977.

Wallis was a professional engineer at Langley Research Center for 24 years. He worked for most of his career in the Langley Facilities Engineering Division. In 2001, he transferred to the 8-ft High Temperature Tunnel where he served as the Facility Safety Head. During his tenure at the 8-ft High Temperature Tunnel, the facility successfully completed two entries of the Office of Naval Research HyFly program's Dual Combustor Ramjet Engine, two entries of the Joint DOD / JDA separable missile nose cone test, several Thermal Protection System Tests, and numerous facility enhancement tests.

"Even among NASA engineers, Bobby's ability to fix anything was special," said Steve Harvin (Experiment Research Service Leadership), a co-worker of Wallis. "Bobby always offered a calm, patient ear for the facility staff. He provided sound engineering judgment, a genuine concern for the safety and well-being of others, and a great attitude. Bobby will be sorely missed at NASA."

## LETTERS

In official pronouncements our Agency is eager to give itself a credit for introducing a "true" cost accounting. However, I put "true" in quote/unquote because it is not entirely so. There are no charge accounts for a variety of overhead functions that we all have to do, especially in this reorganization period. These costs which I suspect are very substantial get hidden in the cost of the programs because the program accounts are the only ones available to charge time.

Notably, the cost of the current massive moving operation, all that packing-moving-unpacking, will never be known under the present accounting system. Undoubtedly, the savings from the moving operation will be emphatically reported. By how much will they be reduced by the hidden costs nobody seems interested to know.

**Jaroslav Sobieski**  
Research & Technology  
Directorate

## News Researcher

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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](mailto:h.k.henry@nasa.gov)>.

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

# Making History: X-43A



NASA PHOTO

The B-52B soars over the Pacific Ocean on Nov. 16 with the Pegasus rocket and X-43A under its wing, ready for their release and flight.

## Scramjet Approaches Mach 10



NASA PHOTO

NASA Dryden's Brad Neal performs pre-flight checks on the B-52B.



PHOTO BY JEFF CAPLAN

Before the X-43A flight test, engineers in a control room at Langley Research Center monitor pre-flight data. Monitors around the room displayed the B-52B and computer-generated graphics showing the actual positioning of the aircraft over land.



PHOTO BY JEFF CAPLAN

The Pearl Young Theater provided Langley employees and their families the chance to watch the flight together. (From left) Scott Faatz (Hyper-X Office), Sara Faatz, Jim Penland (Hyper-X Office) and Lawrence Taylor (Systems Analysis Directorate) watch as the X-43A reaches its peak speed over the Pacific Ocean.

*Continued from Page 1*

amount of Hyper-X wind tunnel test data at Mach 10 — gathered a few milliseconds at a time — totaled no more than 1-2 seconds.

Now, data telemetered from this X-43A flight returned almost 10 times the total amount of Mach 10 wind-tunnel data. As a bonus for future hypersonic aircraft designers, several minutes of hypersonic aerodynamic data (greater than Mach 5) was also relayed to support aircraft and ground receivers before the X-43A plunged to its preprogrammed splashdown in the Pacific Ocean.

For historical perspective, the X-43A flight was the fastest ever by a jet-powered vehicle, even faster than the legendary rocket-powered X-15 series (reaching Mach 6.7 in 1969) of the 1960s and early 70s.

Evening newscasts, morning newspapers and Web sites trumpeted the accomplishment around the world: "NASA's X-43A research vehicle has screamed into the record books again."

The historic event even made the Letterman Show — twice. The first night, a deadpan Letterman announced the achievement while viewers watched an obvious homemade X-43A model cross the screen supported by strings. The second

night, in a fake current events contest with an audience member, the question was, "What went 7,000 mph earlier this week?" A picture of a mission control room was on the screen. The answer: "Colin Powell leaving the White House."

Poking fun at NASA or a NASA accomplishment? No.

Paying homage to a modern-day example of the Right Stuff? Yes.

NASA Administrator Sean O'Keefe praised the flight in a NASA news release by calling it a key milestone that will "... help advance the Vision for Space Exploration ... and advance commercial aviation technology."

So, the last planned hypersonic scramjet flight was history. Fortunately, it was also a stunning technological achievement that future planners will find hard to forget.

For more information on the X-43A program, visit: <http://www.nasa.gov/missions/research/x43-main.html>.

*Keith Henry is Deputy of the News Media Office at Langley Research Center and has helped represent NASA hypersonics research for 25 years. Henry co-anchored the flight coverage from Dryden on NASA TV.*



NASA PHOTO

The Pegasus rocket ignites after release from the B-52B, beginning the acceleration of the X-43A.

# Making History: X-43A

## Enthusiasm Propels, Sustains Voland's Interest

By **ASHLEY DOW**  
Langley Research Center

If not for Randy Voland's hard work ethic as a co-op student, he might not have had a career at Langley Research Center. Voland enjoyed his time at Langley as a co-op starting in 1981, yet he did not find his work with space-structure applications and aircraft noise reduction interesting. Not wanting to continue the same work he did as a co-op, he searched for jobs outside of NASA.

Shortly after his graduation from North Carolina State, Voland received a call from a Langley propulsion researcher who had heard of his hard work and effort during his co-op experience. Though the young engineer knew nothing about propulsion, he excitedly accepted a job in the Hypersonic Propulsion Branch. He served as the propulsion team-lead for X-43A.

Voland has been involved in the X-43A project since 1996. The same excitement he felt the day he was offered a position in the Propulsion Branch is evident today. "X-43A is exciting because it is a

flight project," he said. "It is a big deal to prove something in flight that actually works."

Researchers like Voland wanted to prove the capabilities of the scramjet engine in flight. Since the problem in the first flight occurred early, the scramjet engine experiment was never reached. To ensure a successful second flight and experiment, Voland's team worked hard to re-evaluate everything. "We had to re-look at everything," he said.

With the second flight behind them, Voland and his team adjusted to the changes of the third flight. One difference to overcome was the jump to Mach 10 from Mach 7. "The engine operates quite differently at Mach 10. So we had a lot of preliminary calculations and tests that were used to finalize a propulsion database," he said.

X-43A was designed to prove that a scramjet engine could power a real plane and accelerate. "We could prove the engine on the ground and in calculations, but we needed to prove it in the air," he said. "The success of the second flight answered a lot of questions for us."

According to Voland, X-43A is only a small

step in proving the success of the scramjet engine:

"To me, the next big step after X-43A would be making these vehicles reusable and discovering how we transition from a low-speed propulsion system to a high-speed propulsion system in flight." He thinks if the transition can be made successfully and the aircraft can take off from the ground, the engine system will be proven for practical purposes, such as the first stage of a two stage space launch vehicle, or potentially for commercial air travel.

Voland's involvement with X-43A and the resources available to him through NASA, have kept him working at Langley. "I have worked with a lot of companies and universities, but the facilities and people here at Langley have the potential to do and create amazing things," he said. "It is still one of the best places to work."

Aside from his involvement with X-43A, Voland is working on his master's degree in bio-engineering from Arizona State. In his small amount of spare time, he enjoys camping and outdoor activities.

It is a  
big deal  
to prove  
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actually  
works.



Randy Voland was the propulsion team-lead for the X-43A program.

PHOTO BY TOM TSCHIDA



Zane Pinckney worked with the Hyper-X Program since the beginning.

PHOTO BY JEFF CAPLAN

## Pinckney Sticks with Program Since its Start

By **ASHLEY DOW**  
Langley Research Center

When the X-43A went through Mach 1..., the operations room ... was so quiet you could have heard a pin drop.

Tall in stature and thin in build, Zane Pinckney resembles a former one-time basketball player or track and field star. Eager to share his knowledge with others, Pinckney's kind-hearted demeanor is that of a man molded by his experiences.

Pinckney has been a researcher at Langley Research Center for 47 years. He was first offered a job at Langley the summer between his junior and senior year at Florida State. He did not accept the position since he was busy working in his family's electrical contracting business. After graduation in 1957, he decided to work for the National Advisory Committee for Aeronautics and joined the researchers at Langley. A year later, NACA became NASA, thanks to the National Aeronautics and Space Act.

While at Langley, Pinckney worked on many projects. However, the makings of X-43A have been

with him since the beginning. "I started working with the Hyper-X Program (X-43A) at its inception," said Pinckney. The X-43A is a scaled version of a 200-foot Mach 10 cruise airplane. After helping the contractor design the vehicle, Pinckney's first assignment was to modify and optimize the engine design to operate efficiently at the small scale of the X-43A.

Within the X-43A Propulsion Technology Team, Pinckney's specialty was designing the engine flowpath - the basic internal shape of the engine. Working with the fuel injector designers and lessons learned by the test engineers, Pinckney designed the initial flowpath for the X-43A in 1996. This engine design proved to be the most efficient engine that NASA ever tested at Mach 7. The best not being good enough, Pinckney continued to work with the test engineers to further improve engine performance.

Pinckney has a special connection

to the scramjet engine in the X-43A. He developed the SRGULL computer code to provide a method to predict ramjet and scramjet engine performance. He had been working on the code since the 1960s.

A scramjet, short for supersonic combustion ramjet, is a promising alternative to a rocket for high-speed flight within the atmosphere.

For his contributions to ramjet and scramjet engine performance, Pinckney won a NASA Space Act Award in May 2003, honoring his work with the SRGULL code. He received second place and a cash prize of \$19,000, which he shared with two X-43A task members who helped publish his work.

In March 2004, a week after the X-43A flight, Pinckney received the data gathered from the flight. He was pleased to discover that his SRGULL code prediction was within two percent of actual flight acceleration. Pinckney remembers the X-43A flight as his most memorable

moment at Langley. "When the X-43A went through Mach 1 and had separation, the operations room at Langley was so quiet you could have heard a pin drop," said Pinckney.

"When I came to Langley, I could work on anything I wanted as long as it was in the framework of what my branch did. That is what has kept me working here."

Pinckney retired as a NASA employee after 32 years but has continued contributing as a contractor and works for Swales Aerospace.

Aside from pursuing his interests at NASA, Pinckney is actively involved in little league softball. He once coached a girl's softball team and currently serves as a district representative for the league.

Ashley Dow worked in Langley's News Media Office through the Langley Aerospace Research Summer Scholars' Program (LARSS).

## Colloquium and Sigma Series Lectures

# Hydrogen Fuel: Hope or Hype?

Robert Rose will present a Colloquium lecture, titled "Hydrogen Fuel: Hope or Hype?," at 2 p.m. Dec. 7 in Langley Research Center's H.J.E. Reid Conference Center. A Sigma Series lecture will follow at 7:30 p.m. at the Virginia Air and Space Center in Hampton.



Rose

which rely on hydrogen chemistry instead of combustion. Some nations have even begun to develop commercialization time lines. Hydrogen offers enormous potential as a clean, carbon-free, domestically available energy option. But as the idea has taken hold, some critics have suggested hydrogen is more about hype than about hope. Rose is an internationally known fuel cell and hydrogen advocate.

### The Speaker

Robert Rose is founding executive director of the Breakthrough Technologies Institute (BTI) and the U.S. Fuel Cell Council (USFCC). BTI is an independent non-profit organization dedicated to promoting advanced environmental and energy technologies from the perspective of the public interest. BTI's fuel cell education program, Fuel Cells 2000, was launched in 1993 and is internationally recognized. USFCC is the business asso-

ciation for the fuel cell industry. Founded in 1998, the council has more than 115 members.

Rose is the author of Fuel Cells and Hydrogen: The Path Forward, which proposes a public-private partnership to develop and commercialize fuel cells and a supporting hydrogen infrastructure. He is the 2004 recipient of the Fuel Cell Seminar Award, the most prestigious of its kind in the U.S. Prior to founding BTI, Rose was a private consultant, specializing in policy analysis and public relations. He also served as Senior Special Assistant to Secretary of State Edmund Muskie. Rose received his Bachelor's degree in English and Philosophy from the University of Nebraska in 1968.

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

### The Lecture

NASA uses hydrogen to power its rockets. Can rocket fuel really offer an alternative to oil here on Earth? The Bush Administration and governments around the globe are beginning to think so and have begun to plan a transition to a "hydrogen economy." Spending for research and demonstrations is on the increase. Every major automobile company is experimenting with hydrogen in internal combustion engines or testing fuel cell vehicles,

## Runners' Club Members Sprint to Fall Finish Line

The Langley Runners' Club recently held three 2-mile races and two 10K (6.2 miles) races as part of the NASA Fall Intercenter Competition. Each individual participant's best time from the 2-mile races and the 10K races will be submitted for a competition, comparing the best times, between the NASA centers.

The three 2-mile races were held on Oct. 7, Oct. 19 and Nov. 3. The 10K races were held on Oct. 13 and Oct. 28. All of the races were held at Langley Research Center, starting and finishing near the Reid Center.

There were a total of 52 participants in the 2-mile races and 23 participants in the 10K races. Attached are the best times for each individual in each event. The results are listed in order of time.

There is more information about the intercenter competition on the Runners' Club Web site at: <http://larc-exchange.larc.nasa.gov/lea/runners/>.

Gale Harvey	16:33	65
Tory Scola	16:42	22
Shawn Gallagher	16:55	50
Dennis Dicus	16:58	62
M. Ryan Lowrie	16:58	26
Phil Bogert	16:59	51
Gus Dovi	18:05	62
S. Paul Pao	18:10	64
Victor Carreno	18:20	47
Brian Mason	19:05	20
Rob Calloway	21:36	53
Charles Jenkins	23:25	50
Richard Shearer	24:23	58
Jim Kennedy	25:30	66
Charles Poupard	26:53	50
Tom Noll	26:53	60

### Best Times - Women

Name	Time	Age
Jan Spangler	15:02	49
Michelle Calloway	16:54	43
Martha Cloudsley	17:00	36
Courtney Spells	17:08	24
Kathleen Morris	19:33	30
Odilyn Santa Maria	20:43	38
Carol Fowler	21:58	38
Dana Dunham	22:18	58
Tomeka Watkinson	34:27	54
Nancy Ritchey	34:27	43
Patricia Quigley	34:27	46

### Fall 2004 Intercenter 10-K

#### Best Times - Men

Name	Time	Age
David Witte	39:49	39
Andrew Cutler	40:12	47
Scott Bartram	40:28	43
Walt Bruce	40:40	43
Gabe Merrill	41:08	26
David Lockard	41:09	35
Tom Weih	43:00	35
Michael Smart	44:58	40
Chris Rumsey	45:29	43
Bob Fairbairn	46:23	52
Don Brown	47:14	51
Arthur Johnson	54:40	57
Steve Stalos	54:47	54
Shawn Gallagher	58:39	50
Gale Harvey	59:21	65
Ray Comstock	59:44	50
Paul Pao	65:40	64
Bob Hall	65:40	55
Richard Shearer	85:43	58

#### Best Times - Women

Name	Time	Age
Carol Bartram	46:59	40
Jan Spangler	51:50	49
Kathleen Morris	68:57	30
Dana Dunham	82:16	58

### Fall 2004 Intercenter 2-Mile

#### Best Times - Men

Name	Time	Age
David Witte	11:38	39
Lee Pike	11:42	26
Gabe Merrill	11:44	26
Walt Bruce	11:48	43
Scott Bartram	11:52	43
Andrew Cutler	12:00	47
David Lockard	12:07	35
Bill Fredericks	12:47	22
Michael Smart	12:57	40
Donnie Kham	13:16	24
Ralph Buehrle	13:23	42
Chris Rumsey	13:26	43
Bob Fairbairn	13:50	52
Don Brown	13:55	51
Yong Hu	14:12	39
Mike Wusk	15:07	43
Chris Savinell	15:21	51
Matt Brzowski	15:25	26
Steve Stalos	15:38	54
Dave Shelden	15:52	42
Arthur Johnson	16:17	57
Kuanman Xu	16:25	42
Mike Chambers	16:25	51
Ray Comstock	16:26	50
Tom Popernack Jr.	16:33	41

## Pennsylvania Teacher Shines in S'COOL

By KATHERINE LORENTZ  
SAIC

Since 1998, about 1,700 students have submitted more than 33,000 cloud observations to the Students' Cloud Observations On-Line (S'COOL) project. Of these observations, there have been 9,172 ground-to-satellite matches, with 479 matches (or 5 percent) coming from one teacher's students. This teacher is Todd Toth from Waynesboro High School (Pa.).

"As a student I always liked doing research—labs and field courses always inspired me. S'COOL is one way I can share this enthusiasm with my students," said Toth, a 28-year teaching veteran.

S'COOL is a hands-on project based at Langley Research Center supporting NASA research on the Earth's climate. Students make basic weather and cloud observations at the exact time that a satellite passes over their location—these observations are called ground truth observations. The students' observations are then compared to the satellite data to help evaluate how well the satellite instrument and the scientific analysis methods are performing.

Toth first learned about S'COOL after being introduced to GLOBE by his Waynesboro principal who wanted to start a weather station at the school. With a lot of community support, the weather station became a reality and Toth began using GLOBE protocols to teach students about the weather station. "I have been really lucky. The community is really behind us," said Toth, whose students were able to compile weather forecasts using instruments supplied by local businesses. The local newspaper began running the students' daily weather report on the front page.

With the success of the weather station, Toth developed an Environmental Research course for juniors and seniors.

The extra time and specialized subject matter of this course allowed him to employ S'COOL observations in addition to the GLOBE protocols.

The GLOBE program, managed as a partnership between the University Corporation for Atmospheric Research (UCAR) and Colorado State in Fort Collins, Colo., is an international student observation campaign. GLOBE brings together students, teachers, and scientists to support achievement in science, technology, engineering and mathematics and to gather important data for the global Earth science community. NASA works with GLOBE to help achieve its mission of inspiring the next generation of Earth explorers.

Toth now uses S'COOL and GLOBE in all of his classes, including his ninth grade Earth and space science course. Using S'COOL in the classroom has been very rewarding for Toth. He has seen the students become very technologically savvy and very enthusiastic to learn about Earth's atmosphere and climate.

"They teach each other how to use the instruments and encourage the younger students to take my classes," Toth said. "There is almost always a waiting list to get into Environmental Research."

One of the biggest rewards is seeing his students go on to use what he has taught them, Toth said. "A number of my students have gone on to study meteorology at Penn State. I even have one student who is serving in Iraq. She uses GPS technology and does the weather for her unit. She told me that she learned it all in my class. It is so great to see my kids achieving so much."

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

## CLASSIFIED

**FOR SALE:** 1999 Ford E150 7 Passenger Van. Chateau Style — white with silver trim. 4.6 Liter V8, automatic transmission, power steering, power windows, power locks, tilt wheel, cruise control, am/fm radio, privacy glass, allow wheels, 16 inch tires, 4 captain's chairs, one bench seat. 78,000 miles. Includes Yakima canoe rack - (4) raingutter brackets, (2) 78 inch crossbars, boatloader, gunwale brackets, and straps. Very good condition. \$9,500. Call 864-1411.

**FOR SALE:** 1994 Mercury Villager LS, V6, black/gold body w/beige interior, many features including powered seats, digital trip/fuel computer, ABS, 89K miles, new timing belt, original owner, EC, \$2,900. Call 864-4342 or 867-8249.

**WANTED:** A couple of small farm animals for a church's living nativity scene. Dec. 17 & 18 7 p.m. to 9 p.m. Northampton Presbyterian Church EPC, 1217 Todds Lane Hampton. Call 826-1305 or 838-2322.

### LAA to Meet Dec. 14

The Langley Alumni Association Holiday Luncheon will be held from 11 a.m. to 1 p.m. **Dec. 14** at the Point Plaza Hotel & Suites (formerly the Ramada Inn) on J. Clyde Morris Blvd. Cost is \$15 per person, and guests are welcome. Please make your reservations by calling the Langley Alumni Association (864-7330) and leaving a message. Call the Program Chair, Bruce Conway, at 877-0474 to reserve a spot. Payment can be made at the luncheon on Dec. 14.

The LAA will hold its January 2005 meeting at 11:30 a.m. **Jan. 11** in the Langley Research Center Cafeteria's Langley Room. Charlie Brinley, President of Dominion Terminal Associates will talk about the Newport News port activities related to coal, how it works and what drives the business.

### Polar Express IMAX

The IMAX Theater at the Virginia Air & Space Center opened *The Polar Express* on Nov. 10, and will continue showing through December.

The Riverside 3D IMAX Theater at the Virginia Air & Space Center is located at 600 Settlers Landing Road in Hampton. For information on

tickets and showtimes, call 727-0900, ext. 703 or visit: <[www.vasc.org](http://www.vasc.org)>.

VASC is Langley Research Center's official visitor center.

### LFCU Offers \$20,000 In Scholarships

Langley Federal Credit Union announced it will award four \$5,000 scholarships in 2005. "Providing a scholarship opportunity to multiple graduating high school seniors was an easy decision for LFCU. It is important to recognize the hard work of our Constellation Club members who stand out both academically and within the community," stated Jean M. Yokum, LFCU President/CEO.

■ The Constellation Club is an award-winning program which provides hands-on financial experience for the youth of LFCU. Designed for young members through age 18, the club helps teach the importance of being financially responsible and the rewards of saving. The "Galaxy Graduate Scholarships" are just one example of the many valuable benefits available to young members.

■ Scholarship applications will be placed in all branch locations and available on-line in **January 2005**. Scholarships are awarded at LFCU's Annual

Happy Holidays from the Virginia Air & Space Center!

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Meeting in April. For more information on the Constellation Club and award criteria, visit: <[www.langleyfcu.org](http://www.langleyfcu.org)> and click the "Just for Kids" tab.

Research Center, Mail Stop 207-1, Moffett Field, CA 94035-1000.



### 2005 NACA Reunion Hosted By Ames Research Center

Ames Research Center will host the 11th National Advisory Committee for Aeronautics (NACA) reunion from **Sept. 30** through **Oct. 2, 2005**. For information, contact the NACA Reunion XI organizing committee at (650) 604-1032, <[nacareunion11@mac.com](mailto:nacareunion11@mac.com)> or NACA Reunion XI, NASA Ames

The deadline for the Dec. 17 edition is Dec. 6. Send submissions to <[researcher-news@larc.nasa.gov](mailto:researcher-news@larc.nasa.gov)>.

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In celebration of the holiday season,  
the Director of Langley Research Center,

**Roy D. Bridges, Jr.**

cordially invites all NASA civil service and contractor  
employees and retirees to attend  
a reception  
at the  
**H.J.E. Reid Conference Center**  
**Friday, December 17, 2004**  
**2:30 - 4:00 p.m.**

Sponsored by the  
NASA Langley Exchange

Refreshments and free raffle tickets will be available.  
Drawings will be held at 3:00, 3:30, and 4:00 p.m.