

1995 Ames Lab Group Photo



Group Photo Available – If you'd like an 8x10 print of the Ames Lab group photo, call Public Affairs at 4-1856. The cost is \$2.

INSIDER

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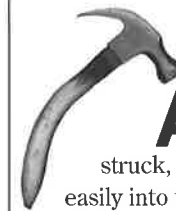
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INSIDER

Newsletter for the Employees of Ames Laboratory ■ Volume 6, Number 10 ■ November 1995

SPELLBOUND IN THE GRIP OF SCIENCE



As the hammer struck, the nail sank easily into the block of wood. The students in the Spedding Hall auditorium leaned forward in their seats, fascinated, as the scientist on stage delivered a few more blows to the nail before the hammer shattered from the impact.

In less than a heartbeat, the students in the front row scrambled to retrieve pieces of the broken tool for closer examination. After all, they had never seen a hammer like this one. Crescent-shaped and yellow, it was nothing more than an ordinary banana—except for one thing. It had been immersed in a liquid nitrogen bath, changing its properties and making it hard enough to drive the nail into the wood.

This scene is a familiar one at Ames Lab. It's repeated several times a year when the Office of Public Affairs and Information coordinates presentations of "The Properties of Materials," a unique show put on by scientist volunteers for visiting student groups.

Offering a variety of opportu-



Cool Science – During a *Properties of Materials* show, these Russian visitors discovered that even a mushy banana can make a good hammer when dipped in liquid nitrogen.

Science Surprise – The Bernoulli effect is what allows aircraft (and ping-pong balls) to fly and is also what amazed these visitors during a science activity night at the Ames Public Library. The Lab staged the special evening of science for Children's Services of Central Iowa, a local child care agency, in celebration of their 25th anniversary.



Story continued on page 4

Something to Shout About

Ames Lab Receives Three Materials Sciences Awards

Ames Lab scientists won three of DOE's nine 1995 Materials Sciences Awards. The purpose of the annual competition is "to identify individual laboratory scientists who have conducted outstanding research and to provide recognition of the accomplishment." Entries are judged by knowledgeable personnel from DOE laboratories as well as the Materials Sciences staff.

"It's a great testimony to the quality of the scientific work done at Ames Lab that three of the nine Materials Sciences Awards were won in competition with 13 much larger laboratories," says Bruce Thompson, associate director for Science and Technology. "This outstanding accomplishment springs from a tradition of academic

excellence and the interdisciplinary teamwork that is an essential element of work done at national laboratories."

Solid State Physics

A team of 11 Ames Lab researchers won the award for "outstanding scientific accomplishment in solid state physics." The team includes Paul Canfield, Alan Goldman, Constantine Stassis, David Johnston, Bruce Harmon, Ferdinando Borsa, David Lynch, Lance Miller, Clifford Olson, David Torgeson and Jerel Zarestky. They have been investigating the electronic and magnetic properties of single-crystal rare-earth nickel-borocarbide superconductors. These materials are among a small group of compounds that are both superconducting and strongly

magnetic at low temperatures. In most materials, superconductivity and magnetism are mutually exclusive; if a material is superconducting, it is usually not magnetic, and vice versa. The coexistence of these states in the rare-earth superconductors has allowed the physicists to learn more about them and their interplay.

"It is no accident that there are many members on this team," says Paul Canfield, associate physicist. "Collaborative effort is needed to define

and solve major problems in physics today. The presence of a DOE lab fosters precisely this type of collaboration."

Solid State Physics

Another team of scientists that includes Alan Goldman, Bill McCallum, Matt Kramer and Tom Lograsso, won the award for "sustained outstanding research in solid state physics." They won for studies of the structure and properties of quasicrystals, a new class of solids discovered in 1984. Unlike crystals, their periodic cousins, quasicrystals cannot be described by a simple stacking of basic building blocks, although they possess their own kind of order.

The existence of quasicrystals raises fundamental questions about the formation, growth and stability of complex materials, since it is not obvious why atoms would favor a complex, aperiodic arrangement. In addition, these materials have commercial promise. Quasicrystalline coatings might be used, for example, as lightweight, low-friction coatings for industrial applications. "The effort that resulted in this award is characteristic of the outstanding collaborations that can develop at a small national laboratory," says Goldman.



John Corbett

Materials Chemistry

John Corbett, senior chemist, won for "sustained outstanding research in materials chemistry." Corbett has devoted the past 15 years to exploratory synthesis and systematic study of broad classes of compounds made from two or more metals, of families of such compounds stabilized by common impurity atoms, and of naked clusters of metals in solids. He has also investigated bonding rules for certain types of mixed-metal compounds. His accomplishments include the creation of the first non-carbon examples of buckyballs. "Some very clever graduate students and postdocs deserve most of the credit," says Corbett. "I just keep pointing them in certain directions." ■



Left to right: Bill McCallum, Alan Goldman, Matt Kramer and Tom Lograsso.



Standing: Ferdinando Borsa and Alan Goldman. Seated: David Lynch and David Johnston.



Left to right: Bruce Harmon, Paul Canfield, David Torgeson, Lance Miller and Clifford Olson. Not pictured are: Jerel Zarestky and Constantine Stassis.

Inside Scoop

Always on a Rescue Mission

Bill Buttermore's grandmother used to hide the clocks when Bill came for a visit. She didn't do it to get her inquisitive grandson to stay longer, but rather to ensure that her various timepieces would last longer.

"I love mechanical things," says Bill, program director for Fossil Energy. "I've always been fascinated with gears and how they work. As a kid, I was constantly tearing clocks apart and putting them back together."

As Bill grew older, he began using his mechanical abilities to restore old stuff to working condition. Thanks to his careful maintenance, he and his wife, Judy, are still using the same washer they got when they were married — and they bought it used then. "I've been keeping it going since 1967," he says.

Bill repairs old stuff that most of us wouldn't dare attempt: plumbing, wiring, air conditioning and more. But his passion is cars, their engines, interiors and bodies. "There's nothing like walking through a junkyard on a crisp fall morning, searching for a part that will do the job, that can be retrieved and returned to service. It's like a rescue," he says solemnly. "Sometimes a car will cry out to you, 'Help me. You can save me from this fate.'"

And Bill has done exactly that, starting with his first car, a 1949 Plymouth four-door sedan that he got for \$25. "The seat fell through the floor on a test drive. I was literally hanging on to the steering wheel," Bill recalls. "I fixed a knock that was caused by a loose pressure plate, cleared an oil line that had sludged up, and got some steel and patched up the floor. I drove that car to college," he adds.

Bill estimates he's rescued over 100 cars in his lifetime. Some of his more memorable vehicles include a 1974 Pontiac Catalina with a V-8 engine. "I disabled four of



Bill Buttermore

the cylinders to make it more fuel efficient," he explains. "It worked well enough on the flats, but in Morgantown, West Virginia, the remaining four cylinders could barely pull that heavy car up the hills."

Bill also owned a 1970 Cadillac with a black lacquer exterior and a red leather interior. "I carried a chamois with me at all times," he says lovingly, the gleam of that long-ago car shining briefly in his eyes. "Every time it rained, I'd pull that chamois out."

But Bill's favorite car wasn't a car at all but a 1970 Chevy step-side pickup. "I painted it bright red, put in a black leather seat from a Cadillac, and installed a gun rack. It came out very nice," he says. "I ended up selling it, and was immediately sorry as the new owner drove away. But I bought it back two years later and restored it again," he adds, pleased with the storybook ending.

"I'm always looking to buy a car; it's a chronic illness that occasionally flares up. You can get such an incredible buy on a car if its engine is no good," Bill says with a smile. "And talk about satisfaction — there's nothing like turning the key on an engine you've resurrected." ■

A Real Joiner

My number one goal is to be happy," says Stacy Joiner, program assistant for Pat Thiel in Materials Chemistry. "I like variety and meeting people."

One of the ways Stacy meets people is by becoming involved with different organizations and groups. She currently serves on the city of Ames Planning and Zoning Commission, which meets twice a month. "I'm really learning a lot about various issues and the city of Ames," she says. "Each item on our agenda is different, and we have to know what the laws and policies are so we can vote appropriately."

Stacy is also the president of the Silver Satellite Chapter of the American Business Women's Association. "The main goal of our group is to raise money to send women to college," she says. "We have a big fundraiser each year during the Christmas holidays when we wrap gifts for shoppers at the North Grand Mall. The money goes to a good cause, and I enjoy the group."

An original member of Ames Lab's Community Advisory Group, Stacy represented the Lab last year, learning about the Lab's waste-site activities and advising the Lab's director. "It was a lot of work, but I'm glad I did it," she says.

Stacy's involvement in these activities should help her when she reaches her ultimate goal of working for a nonprofit group. "I'd like to be the executive director of a nonprofit organization," she says. "My job at Ames Lab, which I really like, is good experience because it allows me to build upon my budgeting skills. That, along with my education and experience in civic and community organizations, should give me a good, well-rounded background."

Stacy hopes to complete her master's degree in public administration from ISU in May. She



Stacy Joiner

has a bachelor's degree in family and consumer science journalism with an emphasis in public relations, and a minor in family services.

"I've finished all my classes, and I'm writing my thesis, but it's hard to do with all my outside activities. And we're expecting our first child in April, so I would like to get it done before the baby is born."

So far, our baby has been an 85-pound yellow lab," she says with a smile. "He's a very gentle and nice dog. He's supposed to be a hunting dog, but he's not very good at it. Last week my husband, John, took him hunting, and instead of jumping over or going under the fence like the other dogs were doing, he got to the fence and started crying, and John had to lift him over. Some hunting dog. I guess we baby him too much."

Stacy and John, who is a civil engineer with the city of Ames, will soon have a chance to baby their own child. This should definitely help Stacy meet her number one goal. ■

"High Risk" Property

The DOE has issued an interim policy for the control of "High Risk" property that could adversely affect U.S. nuclear nonproliferation objectives or national security. Ames Lab is implementing a policy regarding DOE transfer of unclassified equipment, materials and information. These transfers can occur through material and equipment sales, exports, CRADAs, patent assignments, exchange programs, presentations, visitors, and communications, such as telephones, faxes and e-mail.

Some of you will begin seeing a "High Risk" sticker placed on applicable property or an "Export Control Statement" sticker on applicable shipping orders for materials.

If you have any questions, call Jack Cummings at 4-1780 or Jim Brazelton at 4-4427.

New Form for Associates

The routing for signature authority on the associateship form has been changed. New forms are available in Human Resources, 105 TASF.



How many administrators does it take to ... ?

Group Photo Available

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TRAINING SCHEDULE

Call Paula Ellis (4-5634) to reserve

NEW EMPLOYEE TRAINING

December 5, 13 and 19
8:15-11:00 a.m.

December 7 and 11
1:15-4:00 p.m.

Held in 305 TASF

Customer Appreciation Coffee

ESG - Mechanical Section

December 5
9 - 11 a.m.

167 Metals Development

Come join us for refreshments.

When Duty Calls

These Boots Were Made for More than Walking

For Darren Huntley, facilities mechanic, it was a routine executive board meeting of the American Federation of State and County Municipal Employees (AFSCME) Union. Normal in every way — that is until the phone rang.

Ironically, the ordinary reverberation signaled the start of an extraordinary odyssey for Huntley, who suddenly found himself talking with the Secret Service.

"They wanted to know if anyone in our union local was interested in driving in the presidential motorcade during President Clinton's visit to Des Moines on October 20 and 21," explains Huntley. "It's fairly common for the Secret Service to recruit union members as motorcade drivers," he adds.

Not about to let the driving op-

portunity of a lifetime pass him by, Huntley, a veteran stock car driver, quickly took the Secret Service up on their offer. On the Thursday evening before the president's scheduled Friday arrival, Huntley met with Secret Service agents at the Savory Hotel in Des Moines for a personal interview. They let him know that he'd passed the security check, asked him a few more questions and told him to be back at the hotel at 2 p.m. on Friday. "I think the fact that I have a good driving record and hold a commercial driver's license helped my chances of being selected for the motorcade," says Huntley.

Dressed in his suit and his white snakeskin cowboy boots, of which his mother-in-law had strongly disapproved, Huntley joined the other drivers at the

Savory on Friday afternoon, where they were briefed on how to handle the job of being a motorcade driver. "We were told never to leave the motorcade once it started and advised that if anyone tried to break into the motorcade, the Secret Service agents would instruct us on what to do," he says.

From the Savory, it was straight to Charles Gabus Ford to pick up eight new 18-passenger vans, and then Huntley and the other drivers hustled off to the airport to await the president. "We lined up at the military gate with the other Secret



Steve Elbert is the first recipient of the Best of Iowa Award for one of the World Wide Web pages he developed. Sponsored by Iowa Online, the award was given to Elbert for building a list of Web servers throughout Iowa and places in Iowa that have Internet access, especially libraries. The winning Web page, Iowa Internet Sites, can be accessed at <http://www.scal.ameslab.gov/links>.

Service vehicles and the president's limousine, which had all been flown in," says Huntley. "While we were waiting for the president to arrive, bomb investigators and bomb dogs went through all the vans. The Secret Service agents checked all the drivers with metal detectors and then gave us lapel pins to wear that showed we had security clearance."

Huntley's van carried telephones, a fax machine, members of the president's personal staff, and some of the Secret Service agents. "The agents were just regular guys and easy to talk to," says Huntley. "They knew I raced cars and joked with me about watching my speed in the motorcade. But they take their jobs very seriously," he adds. "When the president's around, they're stone-faced and all business."

Once the president arrived at the airport, the motorcade escorted him to Veterans Auditorium. "We drove directly into the basement," says Huntley, who recalls that the Secret Service had SWAT team members on the roof and in the top balconies of the auditorium.

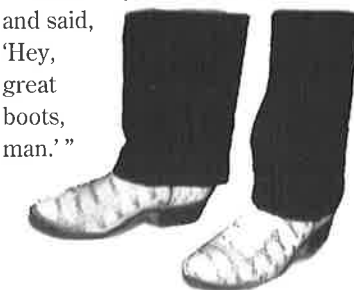
Huntley and the other drivers missed the president's speech because they were required to stay in the basement with the motorcade vehicles. On the other hand, they did get to witness the Secret Service agents in action. Making an interesting analogy, Huntley says, "The coordination of the Secret Service is almost like a ballet. Everyone knows

where everybody else is at all times. They use hand signs for a lot of their communication, and when they do talk, they use code words.

"When you're involved in something like this and you see all the security, precision and coordination that goes into protecting the president, it makes you respect the man's position. Driving in the motorcade was a fantastic experience," says Huntley. "I'd do it again in a heartbeat."

Although he couldn't be in the audience for the president's address, Huntley did finally get to hear Clinton speak. "Before he left Vets, the president asked to meet all the motorcade drivers," says Huntley. "The Secret Service agents told us he'd never done that before, but he wanted to thank us because we had donated our time."

Standing in line watching the president shake each driver's hand and exchange a few words, Huntley gazed at his white snakeskin boots with concern and remembered how his mother-in-law had frowned on him wearing them. But as Clinton came closer, Huntley relaxed, noticing that he, too, was wearing boots. "When the president reached me, he shook my hand, looked down and said, 'Hey, great boots, man.'"



President Clinton was impressed by Darren Huntley's white snakeskin boots. Huntley wore the striking footwear when he drove for the presidential motorcade during Clinton's visit to Des Moines in October.

Spellbound – In the Grip of Science

(Continued from page 1)



A Careful Eye – This student measures 25 milliliters of polyvinyl alcohol to make a slippery, green substance better known as "lime slime." She visited the Lab this summer with a group of students taking part in ISU's Educational Talent Search.



Polymer Fun – This little scientist was proud of the rubber ball he made from water, vinegar and liquid latex when he visited the Lab with other students enrolled in a summer school-age program located at the Department of Transportation.

nities for audience participation, the popular show focuses on materials and their thermal, mechanical, optical and conductive properties.

slime, silly putty, or even miniature rubber balls, activities that allow young scientists to observe chemical reactions and learn more about the properties of polymers. The Discovery Lab's two large magnet tables are always a big attraction, inviting students to investigate magnetism and the forces of attraction and repulsion. And brightly colored geometric shapes help young people test their skills of observation and comparison as they try to create tessellations, special repeating patterns made from multi-sided shapes.

In addition to coordinating Discovery Lab activities, Public Affairs arranges for scientists to visit local schools with information, demonstrations and hands-on science experiments for events such as career days, special science activity nights, Energy Awareness Month and National Engineers Week.

At Ames Lab, students have the opportunity to see science in action, the way it was always meant to be. They may look on, amazed, as a superabsorbent polymer powder



Super-absorbed – A superconductivity experiment holds the attention of these students attending a Properties of Materials show.

literally makes a glass of water disappear before their eyes. Or they may stand, transfixed, as a scientist uses a laser and its computer-controlled scanning head to demonstrate a method of rapid prototyping called stereolithography. But whatever the science students may encounter at Ames Lab, it almost always holds them spellbound. ■



Sweet Science – Metallurgist Scott Chumbley creates excitement during a Properties of Materials show when he demonstrates how miniature marshmallows change when immersed in liquid nitrogen.

The Ride of a Lifetime

John Homer Pedals Across America



And you thought Superman had extraordinary abilities! John Homer crossed deserts, climbed 6,000-foot mountains, endured 109-degree heat, trekked through snow flurries, and was chased by wild birds during a 5,400-mile transcontinental bike ride.

"The ride was the challenge of a lifetime," says Homer, describing the Iowa 150 Sesquicentennial Expedition, which began Memorial Day in Long Beach, California, with a celebration send-off and concluded Labor Day in Washington, D.C.

Homer was one of 300 cyclists, age 10 to 78, who cycled across the country inviting citizens from Washington state to Washington, D.C., to visit Iowa in 1996 when we celebrate our 150th statehood anniversary. "I handed out 5,400



Decked out from head-to-toe in bicycle wear, Homer sets out on his mountain bike for an exciting excursion across America.

invitations along the way, and I hope some of those people will make it to Iowa for our celebration," he says.

Homer notes that superhuman strength is not a prerequisite for crossing the country by bicycle. "It's not as difficult as one might think," he says.

Homer trained by riding 50 miles a day, usually six days a week. "Anyone can do it," he says. "You just have to be prepared."

America the Beautiful

To ensure the ride maintained an historical flavor, event organizers included famous trails, beautiful parks and rustic sites on the expedition route. The ride cut through national parks, prairies, the Gettysburg battleground and the Daniel Boone Trail. "Riding along the Daniel Boone Trail was like riding through a park. It was paved and lined with so many trees that you rarely saw the sun," Homer says.

Homer indicated his favorite stretch of road was the downhill portion of a geological park in Wyoming, where students and geologists from around the world conduct research. "After riding up 6,000 feet, we rode down, and the mountains and cliffs were just gorgeous," he says.

In addition to the colorful scenery throughout the ride, he encountered many colorful people as well. "I met people I will never forget," he says.

When Homer rode the RAGBRAI portion of the ride, he stopped in Homer, Iowa, and met every person in town. "All eight of them," he quips. Fellow cyclists also celebrated Homer's birthday in Cody, Wyoming, with cake, ice cream and root beer floats.

The ride ended in Washington, D.C., with a celebration and a Simon Estes concert, attended by



The "Maytag Repairman," Gordon Jump, questions Homer about carrying a troll during the ride. "The troll was wearing an 'I love biking t-shirt,'" Homer says. "I strap him to my bike, and he sparks a lot of conversation."



Six of Homer's 11 grandchildren show their grandfather support for his transcontinental journey by helping him load equipment.

1,000 people, including every senator and congressman from Iowa. "It really was a memorable trip, and one that I would take again," says Homer. ■

New Employees

Xiaohong Xu, Postdoctoral Fellow (Ed Yeung)

Promotions

John Hjortshoj from Electronics Technician II to Electronics Technician II Lead