Racing on Rays

Lab Hosts Junior Solar Sprint Competition

What's the best way to learn about solar energy? Some Iowa students have a ready answer. Build your own model solar race car from the motor and solar cell up. And then hope the sun is shining in full force on the day of the race.

On May 6, over 200 middle school students gathered at the parking lot behind WOI-TV for the Lab's Junior Solar Sprint Competition. Each team of students had its own stylish race car topped with a solar cell to catch a few rays of energy from the whim sical sun, which made only brief appearances on that cloudy day.

This is the first year the Lab has participated in the Junior Solar Sprint Competition, a national program that encourages students to use their math, science and engineering skills to design, construct and race model solar cars. An important program goal is to involve students and their parents and teachers in a team effort that creates enthusiasm for science. The Lab coordinates the Iowa competition and co-sponsors the event with the ISU College of Education and the Iowa Department of Natural Resources.

"The Junior Solar Sprint Com-



At last, the Junior Solar Sprint Competition begins. It's amazing what a little sun can do to improve the day.





Proud sixth-grade girls from Northwood School display their model solar car, the Sun Star.

petition is an opportunity for teams of sixth-, seventh- and eighth-grade students to direct their scientific know-how, creative thinking, experimentation and teamwork toward solving realworld problems," says Chris Ohana, acting coordinator for the Lab's Office of Educational Programs and a competition coordinator. "The Lab provides team members with a standard solar cell and a motor, but the rest of the car is their brainchild. Unlimited ingenuity and inventiveness can be used in car construction."



It's a long, old racetrack when you're waiting for the sun to show its face and bring life to your model solar car.

Bill Sternberg, a student assistant in the Office of Educational Programs and also a competition coordinator, notes that taking part in the competition challenges students to generate an original finished product. "From paper to payement, the construction of model solar cars allows students to employ principles of math and science in an enjoyable atmosphere," he says. "Each student walks away from this experience with a better understanding of the world of science and technology." ■

INSIDER

Volume 6 / Number 6 / June 1995

Ames Lab Insider is published 11 times a year for the employees of the Ames Laboratory by the Office of Public Affairs and Information. Ames Laboratory is operated by Iowa State University (ISU) for the U.S. Department of Energy (DOE) under Contract W-7405-Eng-82 and is part of the Institute for Physical Research and Technology (IPRT) consortium of fundamental and applied research centers.

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Address correction requested P-208-9

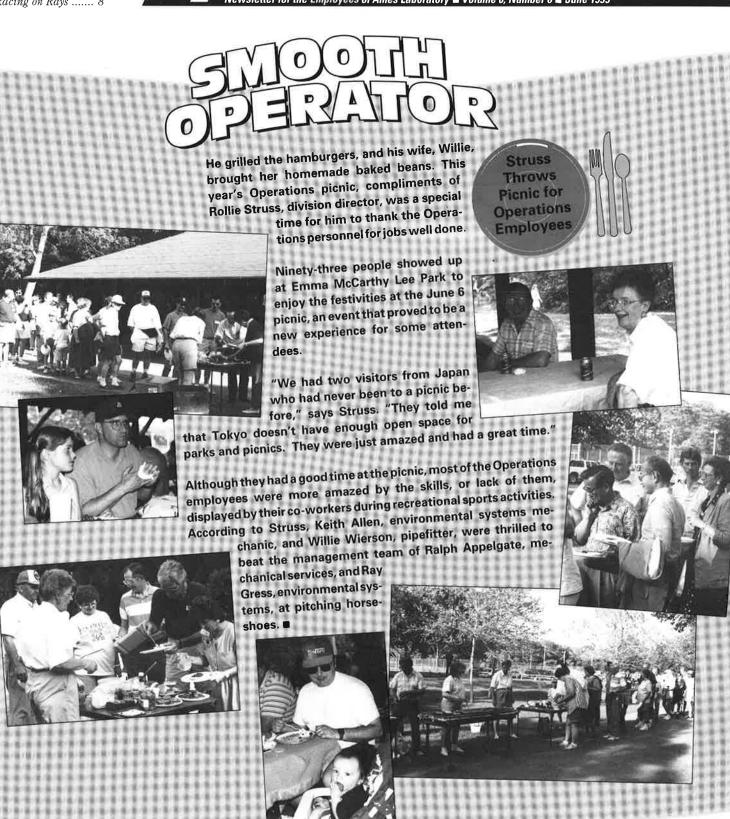
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Highlights



Out-of-This-World Metals Research

Ames Lab Manufactures Ingots for Space Shuttle Experiment

metal solidification experiment that Ames Lab A scientists helped design and assemble will get off the ground this summer—literally. When the space shuttle blasts off from Earth on July 30, it will carry into space four metal ingots that were manufactured

at Ames Lab. The ingots are the heart of an experiment designed in part by Ames Lab scientists Rohit Trivedi and Stephen Mashl.

The goal of the out-of-thisworld experiment, called the Iowa Joint Experiment in Microgravity Solidification (IJEMS), is to better understand how particles in a hot liquid metal redistribute themselves as the metal cools and solidifies.

Conducting this experiment in space eliminates many Earthspecific factors that are absent in space due to the lack of gravity. "This really is exciting," says Mashl, postdoctoral fellow. "We are very lucky to have our work aboard the space shuttle because the number of shuttle launches is so few."

NASA offers access to smart cans to scientists whose research and experiments demand microgravity environments. Mashl says researchers and inventors compete vigorously for the use of NASA's smart cans, and usually the process is long and tedious. "Many scientists request access

to the shuttle smart cans, but only a small number actually experience this opportunity," he says.

Fortunately, Trivedi and Mashl are among them. "I was notified in December about the possibility of Ames Lab being involved, and we had only months to help design the experiment," says Mashl. "We scrambled to prepare for a July launch, which is a very short time frame to put an experiment together."

Trivedi, senior metallurgist and one of the IJEMS designers, describes the project as "a unique opportunity to solve important problems related to materials science under the highly controlled conditions available in space. Scientists need to know how to control particles and their distribution in materials," he says. "Particles that are uniformly distributed in liquid often show nonuniform distribution when the liquid is frozen. Under some conditions, particles form bands that alter the properties of the solid."



Steve Mashl, left, holds a crucible identical to the ones to be launched aboard the shuttle. John Wheelock holds one of the tin-cadmium ingots with nickel particulates he prepared for the experiment.

Trivedi also cites the scientific significance this project has for Ames Lab. "Research breakthroughs in this area are important to the scientific community. If Ames Lab can take a leadership role in materials science, that's a great benefit for our institution," savs Trivedi.

Stronger and lighter metal matrix composites are important for the automobile and aerospace industries. Mashl says, "Even bicycle companies are interested in metal matrix composites."

Rohit Trivedi stands beside NASA's

smart can, which will house the metal

ingots produced at Ames Lab by John

centimeters (32 inches) high and 61

centimeters (24 inches) in diameter, is

where the ingot melting, cooling and

ence and teamwork allowed the

within a short time frame. "This

experiment was able to come

about because of the diverse

talents working on the project,"

Mashl says. "Without the talent

and teamwork of the Materials

Preparation Center (MPC), ISU's

Engineering Research Institute,

Iowa researchers Christoph

IJEMS students and University of

Beckermann and Richard Hardin,

the materials could not have been

prepared on such short notice."

John Wheelock, senior re-

search technician in the MPC,

prepared the metals for the shut-

tle experiment by melting, mixing

and solidifying them according to

"It's nice to know you've had a

hand in something that is going

Wheelock. "It was a great feeling

to find out that something I help-

ed make will be going into space."

up on the space shuttle," says

Additional support for the

project was provided by ISU's

Institute for Physical Research

Grant Consortium and the

University of Iowa. ■

and Technology, the Iowa Space

the scientists' specifications.

experiment to be organized

the Earth's atmosphere.

solidification will take place high above

Wheelock. The can, which measures 81

All Aboard

Once the space shuttle has flown far beyond the Earth's atmosphere and its gravitational forces, the experiment will begin inside the smart can.

The steps of the experiment are controlled by a computer program, which is activated during

> the shuttle's quiet time. Quiet time is optimal for conducting research because there is no activity aboard the shuttle that could disturb the cans.

"All it takes is an astronaut flipping a switch, and the process begins," says Mashl.

After the computer program is triggered by the astronaut, the metal crucibles containing the tincadmium ingots will be heated to 190 degrees C. The ingots will melt and then cool. After the shuttle returns from space, the distribution of particles within the resolidified ingots will be examined by means of ultrasound and optical and electron microscopy.

"I look forward to conducting the post-flight analysis," Mashl says. "I'm sure the findings will be interesting, and hopefully we will gain some insight into metal solidification, which will help to make stronger, lighter metals in the future."

A Group Effort

2

Mashl says talent, persever-



If you have a business to promote, you might consider advertising it on the hood of Darren Huntley's race car. It will cost from \$300 to \$500, but you can't beat the visibility.

Every Friday, Saturday and Sunday from April to September,

Darren climbs into his 1973 Gremlin thunder car and drives onto the racetrack in Marshalltown, Boone or Stuart. Stock car racing is his passion, but he says it wouldn't be possible without the support of his family.

"My entire family goes to the racetrack with me," says Darren, facilities mechanic. "My wife, Teresa, has become very mechanically inclined. She drives the pull truck and goes to the pits with me. Our daughters, Ashley and Whitney, love to work on the car."

When Darren says his entire family goes to the races, he's not kidding. He has two cousins who race, and their wives help Teresa with the T-shirt and hat sales that help finance the racing weekends. From his 80-year-old grandmother, who sits with Ashley and Whitney in the stands, to his cousin's three-year-old son, Darren knows his family will be there to cheer him on.

And they have a lot of cheering to do, because in addition to his thunder car, Darren often drives a street stock car for one of his friends. Street stock cars are bigger than the six-cylinder thunder cars. "They're usually Monte Carlos or Cutlass Supremes and must look pretty much like you drove them in off the street," explains Darren, who is part owner of an 1981 Cutlass Supreme street stock, but says driving his thunder car is more of a challenge.

"My Gremlin has a \$1,500 rac-



Darren Huntley stands beside his 1973 Gremlin thunder

ing motor," says Darren. "The car only cost \$3,000 when it was new. I like speed. I just grew up that way. I got involved in racing in the 1970s when I watched my dad and brother race in Boone and Jefferson. I'm a car nut. I work on my car every night."

Most of that work is done in Ogden at the race shop Darren and his cousins operate. "We do our own painting and lettering," he says. "And I do the welding for my Gremlin and our two street stocks. It's scary knowing our lives could depend on my welds."

However, Darren says they don't worry much about getting hurt because of the safety precautions they take. "We wear fire suits, steel-toed boots and helmets. We're securely strapped in, and the cars have complete roll cages. You must drive sensibly," he adds. "We're not bumper cars.

"To me, racing is no different than golf or softball is to someone else. It's fun and it's weatherpending," Darren says with a smile. It's also time-consuming. In addition to racing and working on his cars, Darren must round up sponsors to help provide financial support through the racing season. It's a way of life from spring to fall, but it's a way of life that works for him and his family.

"You need your family behind you," says Darren. "It's the team effort that makes it fun. I hope to be racing for many years, as long as I have the family support." ■

f variety is the spice of life, then Deb Covey and her daughter, Amber, have lives that are seasoned to perfection.

Two of a Kind

When Deb is not working as coordinator of Planning and Intellectual Property, she finds time to pursue her Ph.D. in Civil Engineering. "I hope to be

done by the year 2000," she says. "I've been taking one or two classes a semester. It's hard work, but it's enjoyable and well worth it."

In addition to her studies, Deb also plays the piano, belongs to three bridge clubs and creates stained-glass art. This summer she will work on remodeling her house and landscaping the backyard.

Crafts, woodworking and decorating cakes are additional items on Deb's long list of current interests. "This list just seems to grow longer," she says. "And as Amber matures, she's also developing many interests.

"This is definitely a trait my daughter and I have in common," says Deb. "We have always juggled many activities and are very similar in that respect. Amber's involvement gives me opportunities to participate with her in many school and community activities."

Deb says eleven-year-old Amber's busy schedule includes community theater, dance, softball, basketball, swimming and golf. "She even plays the French horn and piano," Deb says proudly.

After hearing about their bustling schedules, one would assume that Deb and Amber's time together consists of a few minutes at the breakfast table. Actually,



Deb Covey and daughter, Amber.

they spend a lot of time together. "Luckily, we like many of the same things and are often involved in activities together," Deb says. "Amber and I both do crafts, and we even took ice skating lessons together when she was younger. I really enjoyed helping backstage when she was in the Nutcracker ballet and for her dance recital production. Besides, we spend a lot of time in the car together because I'm always shuttling her to and from activities," quips Deb.

Deb and Amber both have busy summer schedules planned. "Amber will be involved in golf and dance and will also be on a swim team. I'll be landscaping the yard and playing bridge and golf," she says.

This determined duo also plans to take a couple of vacations and spend some quality time away from work and school this summer. "We're planning a trip to the Mall of America, and we'll be going away for the Fourth of July," says Deb. "We look forward to having a fun summer and doing a lot of things together." ■

Volunteers are needed to work shifts in the Lab's Iowa State Fair booth August 10-20. All volunteers will receive white polo shirts. The exhibit, "It's a Materials World," will be located in the Varied Industries Building. Please call Public Affairs at 4-1856 to volunteer.



ISU's new solar car, PrISUm Cynergy, was in Sunrayce '95, June 20-29. The 1,100-mile race began in Indianapo-



lis and ended in Denver. Pictured in front of the car just prior to the team's departure for Indianapolis is Rollie Struss, division director for Operations. 'This one has a better chance of winning than the previous cars," he said. "It has a more advanced design and is better built." Next month's *Insider* will feature Ames Lab employees who helped design and build the PrISUm Cynergy.

POLO SHIRTS FOR SALE

If you are interested in buying an Ames Lab polo shirt, you can place your order in the Public Affairs Office in 111 TASF. Several colors are available.



Ames Lab Polo Shirt Order Form

100% Cotton Jersey (preshrunk)

Name Office _____ Phone ____

Colors Available: White, Ash and Ivory

w/ Royal Blue ink

S, M, L, XL: \$15.50 ea.

Black, Navy, Red, Jade, Purple, Forest Green, Burgundy and Athletic Royal w/ White ink

1. Size ____ Color _____ Price _____ 2. Size ____ Color _____ Price ____

3. Size ____ Color _____ Price ____ 4. Size ____ Color _____ Price ____

CHECK or CASH (circle one)

TOTAL __

XXL: \$17.50 ea.

Make checks payable to Dianne Borgen.

CHICOMETRICS

Chicometrics, a muscletoning exercise class, is held at noon on Mondays and Thursdays in 205 TASF. Contact Vicki Hahn in Occupational Medicine if you have any questions.

SHIPPING ORDERS

Shipping orders are now accessible on the public drives and VAX drives. For more information, call Jim Brazelton at 4-4427.

In the Spotlight







Karl Gschneidner,

senior metallurgist

Moorman, senior

research technician

(left), Jack

Pecharsky, associate scientist, will receive the Russell B. Scott Award at the 1995 Cryogenic Engineering Conference in Columbus, Ohio, in July for the best research paper presented at the 1993 conference. The paper, on magnetic refrigeration materials for the liquefaction of hydrogen, was published in the proceedings, Advances in Cryogenic Engineering.

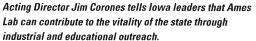


Jan Jensen, student associate, received the 1995 Zaffarano Prize for Graduate Student Research. which recognizes superior performance in publishable research. Jensen, who worked under the guidance of Mark Gordon, Lab associate and ISU professor of chemistry, has ten publications in print, one in press and one submitted. Several more are in preparation. Established in 1988, the \$1,000 prize is

funded by an endowment named for Daniel Zaffarano, former ISU vice president for research and dean of the Graduate College, at his retirement. Zaffarano was a researcher at Ames Lab from 1949 to 1971.

Ames Lab + Industry = Success

ow to best utilize Ames Lab's resources to benefit Iowa was the theme of a May 30 meeting between the Laboratory and industrial, labor, education and community leaders from across Iowa.



Jim Corones led the meeting and invited participants to help the Lab develop its industrial focus by identifying "thematic areas" in which the Lab can interact with Iowa's industrial sector. Using environmental technology development (ETD) as an example, he told participants that the Lab has the tools to work with industry to solve problems but needs outside input to locate industrial partners. "The ETD area is well defined at the Lab and could provide many outreach opportunities on the state level with state players," says Corones. "The Iowa Companies Assistance Program is another area that provides opportunities for greater outreach."

Acting Director

Already aware of the successful industrial outreach at Ames Lab through Cooperative Research and Development Agreements,

Myrt Levine from the Iowa Business Council encouraged the Lab to implement more consortia-type business arrangements. "Many companies are learning how to collaborate more, and you need to learn to do the same thing," Levine said.

"Identify all of your strengths and proceed down that road," said Ted Davidson from the Iowa School Boards Association, who expressed interest in the educational opportunities at the Lab for Iowa students through programs such as Adventures in Supercomputing.

"It's important that the Lab have flexible, dynamic partnerships in many areas," said Corones. "A consequence of our outreach, whether industrial or educational, should be a positive impact on the Iowa economy."

A High-Tech Reunion

omputers in tow, 30 Iowa high school teachers arrived at Ames Lab on June 12 for a week-long Adventures in Supercomputing (AiS) workshop. Representing 15 high schools that have joined the AiS program over the past four years, the teachers were anxious to take advantage of the unique reunion.

No longer novice travelers in the world of computer software, hardware and jargon, they had come to share their supercomputing exploits and skills. Some of them gave presentations on topics such as data analysis techniques; grant writing and planning; and using Mosaic to view graphics and information on the World Wide Web.

Barbara Helland, acting pro-



Barbara Helland points the way to another supercomputing adventure for AiS participants.

gram director for Applied Mathematical Sciences and coordinator of the AiS program, adds, "A highlight of this year's workshop was to involve the teachers in an effort to formalize AiS materials into an electronic textbook, tying in the math and science standards set by the National Council of Teachers of Mathematics." ■

New Employees

Kylie Brown, Postdoc Fellow (Andreja Bakac)

Tiangu Gu, Postdoc Fellow (Alan Goldman)

Jerry Sayre, Custodian I (Lvnn Runge)

Kris Sperfslage, Secretary I (Lynnette Witt)

Marija Vojnovic, Visiting Scientist (Robert McCarley)

Looking Forward to a Lighter Load

e began working at the Lab as a junior chemist in a metallurgy group on July 1, 1953. Forty-two years later to the day, Dan Williams, division director for Planning and Technology Application, will be enjoying his first day of retirement.

Williams is looking forward to a break from time demands. "Soon, I will not have to do things according to a particular schedule. There should be a noticeable change in the amount of stress I live with. I hope so," he adds with a chuckle.

Williams began his career when the Lab was involved in follow-up work to the Manhattan Project. "We were investigating reactor materials," he says. "I was working on alloys that potentially would be useful for nuclear applications."

After completing his masters degree in nuclear engineering, Williams made the jump from research to administration, working with Norm Carlson, the first director for the Lab's Metallurgy Program. Not long after that change, Williams added another

dimension to his career, which was starting to show signs of the variety it eventually entailed.

Dividing his time between scientific and academic administration, Williams helped Carlson and others spearhead the effort to establish the metallurgy department at the graduate level at Iowa State. Following that success, Williams became involved with the team that developed the undergraduate components of the metallurgy department. "Most of the people who were interested in and able to do work in metallurgy had some association with Ames Laboratory," he says. "So the Lab was a central force in getting the metallurgy curricula and metallurgy graduate and undergraduate programs established."

In the late 1970s, Williams redirected his talents, moving away from scientific and academic administration to become part of the Lab's management team. "I've had the benefit of doing a variety of creative, interesting and rewarding things," he says. "And I've been extremely fortunate in being able to work with many

very excellent people in all parts of the Laboratory, as well as outside of the Lab, especially in the areas of technology transfer and technology application. Helping to get the federal laboratory system involved with the national program to better use federally funded research to improve the economic security of the nation has been a highlight and one of the most important parts of my

Williams says he will miss being a part of efforts that are at the cutting edge, but he anticipates future interactions both within and outside the Lab will provide opportunities to remain involved.

"My wife, Dorothy, is a laboratory supervisor in Veterinary Clinical Pathology and will retire the same day I do," says Williams "We want to stay involved, doing meaningful things that are not just associated with personal activities, but we don't want those things to be so demanding that we can't tell we're retired."

Looking forward to a more relaxing schedule, Williams and his wife intend to do some trav-



Dan Williams

eling to visit children and grandchildren and then to spend time in parts of the country they especially enjoy.

Williams also plans to reactivate interests that have long been on hold. "I know I'll get back to golfing," he says with determination. "And I have a classic automobile, a 1950 MG TD, that needs some work." In a wistful voice he adds, "Also, I was a sailor once, and it might be fun to try sailing again." ■

New Writer on the Science Scene

Lutz Strives for Grace and Style in Science Writing

There are very few things that bore Diana Lutz. She's interested in just about everything, and science is high on the "just about everything" list.

"I grew up in a family of scientists," says Lutz, science writer for the Office of Public Affairs.
"It's intrinsically interesting to know what the world is made of and how it works. Children ask questions about this all the time," adds Lutz, who came to the Lab from Madison, Wisconsin, where she worked as a freelance science writer and editor for *American Scientist* and *The Sciences*.

Lutz's career as a science writer was unplanned; it developed out of the basic need to have a job. She had completed the coursework for her Ph.D. in English literature in 1978, a time when very few people were getting university jobs in the humanities, so she made a change. "I had to earn a living so I talked my way into a job with a corporate engineering magazine that was just getting started. Things just went from there," Lutz recalls.

"Science writing is very much an accidental profession," says Lutz. "I'm self-taught. I got my background by reading review science magazines from cover to

"A debate rages perpetually about whether it's better to have the science training and learn how to write, or start out being a writer and learn the science," Lutz continues. She explains that different organizations have distinct views on the answer to that argument and adds that when she worked as an editor for Scientific American, there was only one person on the staff who had a science background. "We were all liberal arts types who had made the transition the other way around. Scientists generally are astounded, amazed and appalled by this," says Lutz with a grin. "But what you learn if you get a really tough liberal arts education is how to

read and how to understand what you read. There's nothing more crucial than that when you're trying to report on somebody else's work. A good writer has done a lifetime's worth of reading."

The impulse to teach is what Lutz believes continues to spark her desire to be a science communicator. "There's a teacher in me somewhere," she says. "I'm astonished when people feel they can't understand something or think something is boring because they don't understand it. I will do amazing things to try to overcome that attitude. It helps to have this desire to teach and to

"I'm very impressed by the caliber of people here. They're world-class scientists, and that makes this a very attractive place to be." —Diana Lutz

communicate, to be just stricken when you say something the other person doesn't understand, to take that very seriously and come up with a way to talk about science gracefully and with style."

To accomplish that task, Lutz believes a writer must be genuinely interested in the science he or she is writing about. "If you don't have that enthusiasm, it's quite hopeless," she says.

As she puts it, Lutz has been "hanging around science for a long time." But there's something in addition to the drive to teach and communicate that keeps her on the science scene, something a little more personal.

"I've always been the typical 'A' student—someone who would stay a student forever if they could," she says poking fun at

herself. "One way of remaining perpetually a student and always having something challenging to learn is to go around and ask scientists what they're doing. Scientists are alive intellectually."

For Lutz, the up side of being a science writer is definitely the opportunity to interact with scientists. "I've always thought that people were truly blessed if they could say they like their work so much that even if no one paid them, they would still do it," she says. "Most of the people I know who have said that are scientists. I've never seen people so in love with their work as some of the scientists I have encountered. It's fun to go along for the ride."

Although the ride may be a thrilling one, Lutz finds there are always a few bumps in the road. "The down side of being a science writer is definitely that I'm always an apprentice; I'm never a master," Lutz says. "As a science writer, you're forever on trial."

Lutz, however, has had mostly favorable judgments in a sciencewriting career that has ranged from copyediting textbooks for doctors to writing for retirees about fish and game in Wisconsin, and has included everything in between. But what she's most proud of is a recent request from The Hornbook Magazine to write an article on children's science books. The Hornbook is a wellknown and respected publication that reviews current literature for children and recommends books for children and young adults.

"Since having a child of my own, I've been writing about children's science books," says Lutz. "As someone who has been doing science writing for adults, the thing that strikes me immediately is that very few children's science books show evidence that a scientist was consulted at any point in the process. To me, this is quite astonishing, and I've sort of made a second career of point-



Diana Lutz

ing this out," Lutz says resolutely.

Consulting with scientists is all part of a day's work for Lutz. As the new managing editor for *Inquiry*, the Lab's science magazine, she spends a good part of her time visiting with scientists, learning about their research and tracking down future science stories for the publication.

"So far I've talked to about 20 Ames Lab scientists in detail about their work. I'm very impressed by the caliber of people here," says Lutz. "They're world-class scientists, and that makes this a very attractive place to be. Any science writer is just a parasite on scientists; if the scientists aren't doing good work, the parasite doesn't live very high on the hog," Lutz quips.

To make others more aware of Ames Lab science, one of Lutz's first efforts has been to increase *Inquiry*'s distribution. "I think Ames Lab is still hiding its light under a bushel," she says. "So we'll send the magazine to more people. Beyond that, a great deal more can be done with materials science in the general press than is being done now. Materials science is key to a lot of other things, and it gets almost no press. So I look at this as a challenge. It's a hard sell, but I think it can be done."

Ready to Relax

fter 32 years at Ames Lab, Pat Stowell, pipefitter, says he's ready to retire. "I want to relax and rest for awhile. I'd like to do what I want to do when I want to do it. I plan to do things like traveling and fishing, and I don't want to be tied to any one thing." Stowell and his wife, Pat, plan on traveling to California, Colorado and South Dakota to visit relatives and friends. "We'd like to have time to do sightseeing along the way," he says. "If we see something interesting, we want to have the time to stop and enjoy it."

Stowell, who will retire on June

30, came to Ames Lab in 1963 as a truck driver and then worked in the materials handling area. Within five years, he was offered the opportunity to join the plumbing group, which was a good fit because he had previous training and experience as a plumber.

stowell has also worked as a plumber outside of the Lab. Recently he sold his plumbing supplies and equipment so he could really retire. "Now when I'm asked to do jobs for people, I can tell them no because I don't have the equipment anymore," he explains with relief. He may get a part-time job this fall after he's

had a summer to relax and enjoy himself. It will not, however, be in plumbing. "That work is too hard," he says.

Looking back, Stowell has many fond memories of Ames Lab. "This is a great place to work, and I've got a lot of friends here," he says with emphasis. "Everybody at the Lab helps each other. If you need a hand, all you have to do is ask. And Ralph (Appelgate) has been very supportive. I'll miss everyone, but I'll come back and check in with them once in awhile."



Pat Stowell