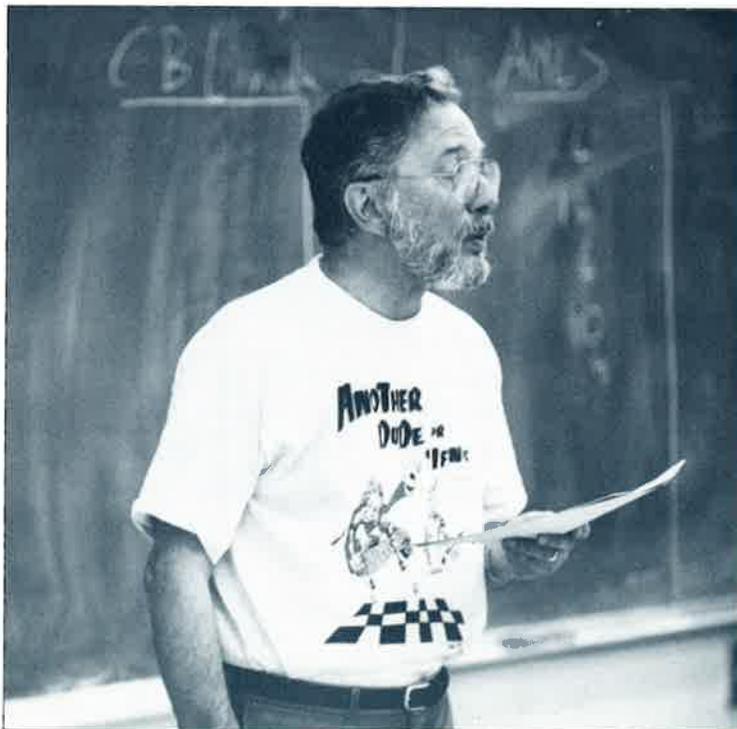


AMES LAB INSIDER



Another Dude For Science - Ames Lab Science Bowl (Page 4)

Initiative and Ingenuity Lauded in Tech Transfer Awards

Remarkable effort by Ames Laboratory researchers recently enhanced the transfer of two innovative technologies to industry. Acknowledging this uncommon initiative, the Federal Laboratory Consortium for Technology Transfer (FLC) honored Iver Anderson, Barbara Lograsso and Tim Gray for their work, bestowing on each a 1991 Special Award for Excellence in Technology Transfer.

Working cooperatively in direct relationships with industry leaders and with ISU's Center for Advanced Technology Development (CATD), each award recipient helped smooth the road from laboratory to commercial success, providing model examples of how research should transfer to industry.

ULTRAFINE POWDERS THROUGH NEW PRO- CESSING TECHNIQUE

Ames Lab metallurgists **Iver Anderson** and **Barbara Lograsso** are inventors of a unique powder processing



Iver Anderson

technique that provides a more efficient, cost-effective and safer way to produce powders of neodymium-iron-boron alloys used to make super-powerful

permanent magnets. The high pressure gas atomization (HPGA) technique yields powders that exhibit improved magnetic properties. Possessing highly desirable characteristics, such as a very small, spherical shape, these promising powders bond especially



Barbara Lograsso

well with polymers, resulting in heat- and corrosion-resistant, sturdy yet flexible magnets that command a high-volume consumer market.

Anderson and Lograsso dedicated their time and talent to transferring the new powder processing technique to industry. The direct recipient of this technology, Edge Technologies, Inc. of Ames, is already producing low-cost rare-earth-iron alloys and recycling scrap as a result of utilizing Ames Lab's thermite reduction process.

Active in various phases of the technology transfer process, including developing, patenting, marketing and designing a large scale gas atomizer system, Anderson and Lograsso proved tireless in their dedication to the project. "We believe in this technology," asserts Anderson. Lograsso confirms, "Our research direction is worthwhile, creative and generates interest."

The Ames Lab high pres-

sure gas atomization technique produces powders that display a compact microstructure characterized by very fine, uniform and spherical-shaped powder particles. These powders promise a higher quality magnetic material and the opportunity to gain an edge over foreign-produced products. "The impact of this technology could be phenomenal," claims Anderson. "It's essential to communicate that message. We don't want the magnet industry to go overseas!"

The unmatched quality of the magnetic materials resulting from these fine powders allows for smaller but stronger magnets that multiply the efficiency of an array of small motors used to power home appliances, automobile parts, power tools, computers and many other everyday items.

Encouraged by research results as recent as April 9, Lograsso and Anderson feel this new development might be just what is needed to impress industry leaders and drive the high pressure gas atomization technique more rapidly into the marketplace. "On that day," notes Lograsso, "Jerry Ostenson reported some exciting news after making baseline measurements on a new powder sample. We had doubled our record to date for magnetic strength, and it is well within the range of commercial bonded magnets!"

Anderson and Lograsso worked diligently to make their laboratory success a viable commercial endeavor. They express pleasure at being selected as recipients of

the FLC Special Award for Excellence in Technology Transfer. "It's the first award I've ever won," grins Anderson. "I've always done science from the standpoint of how it can be applied in the real world. The area of technology transfer is one that makes me tick!" Commenting on the honor Lograsso adds, "It's wonderful that a peer review chose our technology for this award. It's very personally satisfying."

Both Anderson and Lograsso acknowledge fellow Ames Lab researchers whose varying areas of expertise helped advance the HPGA technology that culminated in the FLC award. "We are very grateful to Bill McCallum for the measurements and thermal and microstructure characterization he did for us. Additionally, we owe a tremendous thanks to Rick Schmidt for providing the materials to work with and processing advice," concludes Anderson.

TARGETING MATERIALS DEFECTS WITH A NEW NDE SYSTEM

Tim Gray, engineer at the Center for Nondestructive Evaluation (CNDE), designed a creative new nondestructive



Tim Gray

evaluation system and, through one-on-one interaction with company engineers and management leaders, successfully transferred the technology to John Deere Waterloo Works, the Iowa-

based manufacturing unit of John Deere Worldwide Operations. This cooperative and productive alliance had its beginnings with an extensive survey of the commercial market conducted by John Deere to find existing technology they could apply to a significant problem—poor quality of steel raw materials. Unable to find what it needed commercially, the company solicited proposals. That is how John Deere met Tim Gray.

Gray demonstrated his applied research work in ultrasonic detection methods to Deere company engineers visiting the CNDE seeking an inspection technique that would reveal flaws and imperfections in raw materials. “At the time, it never occurred to me that they were looking for someone to build a system,” Gray reflects. Deere’s goal was to avoid poor quality materials initially and thus lessen the economic liability of defective machine parts.

Gray’s nondestructive

evaluation system provides more reliable assessments about the size and location of defects than standard devices and can analyze specific shapes, such as cylinders, that other methods cannot.

Impressed by the distinguishing features of Gray’s novel system, Deere engineers sent several samples to him for analysis. About a year later, the company funded a prototype that would meet their specific needs. Gray designed the system concept, developed the analysis capability for predicting the quality of the material from ultrasonic signals, and integrated the hardware/software components.

Gray devoted considerable amounts of time and expertise to the effective transfer of the nondestructive evaluation system to John Deere. Working with Iowa State University officers and Deere’s legal department, he helped draft a contract stipulating legal rights and responsibilities for both parties. He visited the

company to achieve a better understanding of the needs and problems on the industry floor. To adapt a design that met budget and time limitations, Gray met with company directors, engineers and technicians to clarify the needs and uses for the instrument. He provided training to company engineers and technicians both during and after instrument construction. Additionally, Gray worked with Deere public relations personnel, responding to inquiries and participating in a press conference and interview with the trade press once the system was complete.

“I came to appreciate more about what goes on in the real world,” Gray says of his technology transfer experience. He partially attributes the success of this undertaking to Dan Williams, Ames Lab Associate Director for Planning and Technology Application. “A lot of things could not have happened without his help and guidance. He always viewed it as an

important project and was very supportive,” notes Gray.

Gray views technology transfer as being a very critical aspect of research. “It’s the right thing to do,” he emphasizes. “I’m pleased to be acknowledged by the FLC for what I did. ...What I did was what I should have been doing. It’s nice to get recognized, but not necessary.”

FEDERAL LABORATORY CONSORTIUM

The FLC was established in 1974 and formally chartered by law in 1986. Consisting of appointed representatives from more than 500 federal research and development laboratories, representing 16 government agencies, the Consortium promotes technology transfer nationwide as an important priority for strengthening the national economy.

The Ames Lab is committed to this priority, evidenced by five previous Special Awards for Excellence in Technology Transfer from the FLC. □

Ames Lab Introduces the Sun Ranger...

its newest solar-powered creation. The solar electric truck, being built by the Lab’s shops, will be on display in front of Metals Development during Veishea’s May 3 festivities. Rollie Struss, associate director for operations and the originator and coordinator of this project, says, “The solar truck is not complete, but it will be displayable.” The Sun Ranger, a brightly painted utility pickup, “should arouse some

attention and interest in the Lab,” adds Struss.

The maintenance shop’s new pickup is expected to be driven an average of 10 miles a day. With a maximum speed of 50 miles per hour, the ideal and average speed is 35 miles per hour.

Solar collectors and batteries added to the modified 1984 Ford Ranger will allow it to harness the sun’s rays as energy. On cloudy days, the Sun Ranger can be plugged



Ray Gress removes the Sun Ranger’s engine, making room for the battery pack and electric motor.

into an electrical outlet for a recharge. The vehicle’s performance and efficiency will be fully monitored and tested.

After the truck’s completion later this summer, the *INSIDER* plans a more detailed article. □

Ames Lab Hosts Top-notch Talent

On Saturday, March 23, some fabulous talent appeared in Ames. The performance was first-class and amazing. It was not held in Hilton, did not require advance reservations and did not cost \$25!

Ames Laboratory's first High School Science Bowl proved academic competition can keep you on the edge of your seat, make your palms sweat and drive you crazy every bit as much as athletics.

The Iowa tournament was organized to promote interest in science among high school students and was part of a national competition sponsored by the U.S. Department of Energy; the Intel Corporation, a manufacturer of microcomputer components; and other, local sponsors.

"What we see here is an important effort to recognize achievement in science—just like we recognize achievement in athletics and other areas," explains Ann Thompson, educational consultant for Ames Laboratory and ISU associate professor of education.

Ames Lab Director Tom Barton officially welcomed the ten competing Iowa high school teams at nine o'clock on a rainy Saturday morning during Science Bowl opening ceremonies. "An objective of this tournament is to strengthen your resolve to be

involved in the wonderful world of science," Barton remarked to attentive participants. "I anticipate that you will have both a frustrating and rewarding day!"

It was that, indeed, as high school teams from around the state filled the halls and classrooms in Science II—



each four-member team scrambling to come out on top in the double-elimination, college bowl style tournament. Attacking toss-up and bonus questions

with zeal, these brilliant high schoolers held onlookers spellbound as they gave rapid, accurate answers, one after another, rarely missing.

Asked if her team had any special training for the science bowl, Heather Schafroth of Ames High, replied, "Just school, and the chance to compete in other quiz bowls during the year."

Most of the students who participated in the science bowl are veterans of academic competitions such as this, engaging in several tournaments throughout the school year. While these other competitions cover a wide range of subjects, the Ames Lab Science Bowl is Iowa's only quiz bowl dedicated strictly to science, covering the areas of astronomy, biology, chemistry, computer science, geology, math and physics.

Kirk Daddow, sponsor for

the Ames High team, commented, "We need more opportunities like this. Look at all the interest athletics gets; there are very few offerings that call attention to academics. Every kid like those competing here today deserves a moment in the sun!"

Placing high priorities on science education, several Ames Lab researchers and graduate assistants offered their services as scorekeepers, moderators and judges for the Saturday of science. Highly skilled science professionals, these volunteers were often seen during and between matches with looks of incredulity on their faces, open tributes to the remarkable knowledge and talent displayed by the young competitors. Remarks such as, "they're amazing" and "I can't believe these kids," abounded as the crackerjack teams proved time after time that science is alive and doing more than well in Iowa!

Not concerned with the old stereotype of the "science nerd," these young people find it is not only "cool" to be interested in science, but also very necessary in today's high-tech world. Zeroing in on the importance of being science literate, Ryan Barton from East High in Des Moines, remarked, "Science affects everything!"

Like all competitive events, the Ames Lab Science Bowl could have only one winner. Lincoln High School of Des Moines captured first place, with Ankeny High and Ames High finishing second and third, respectively. Each winning team received

certificates and trophies.

Ed Pilkington, sponsor for the first-place Des Moines Lincoln team, enthusiastically noted, "I'm a coach, but I see more intense competition in academics than in any athletics. School pride is coming back!"

Competing in Washington, D.C. on April 21-22, Des Moines Lincoln made it to the final eight teams in the National Science Bowl. The winner was Lubbock (Texas) High School, sponsored by the Superconducting Super Collider.

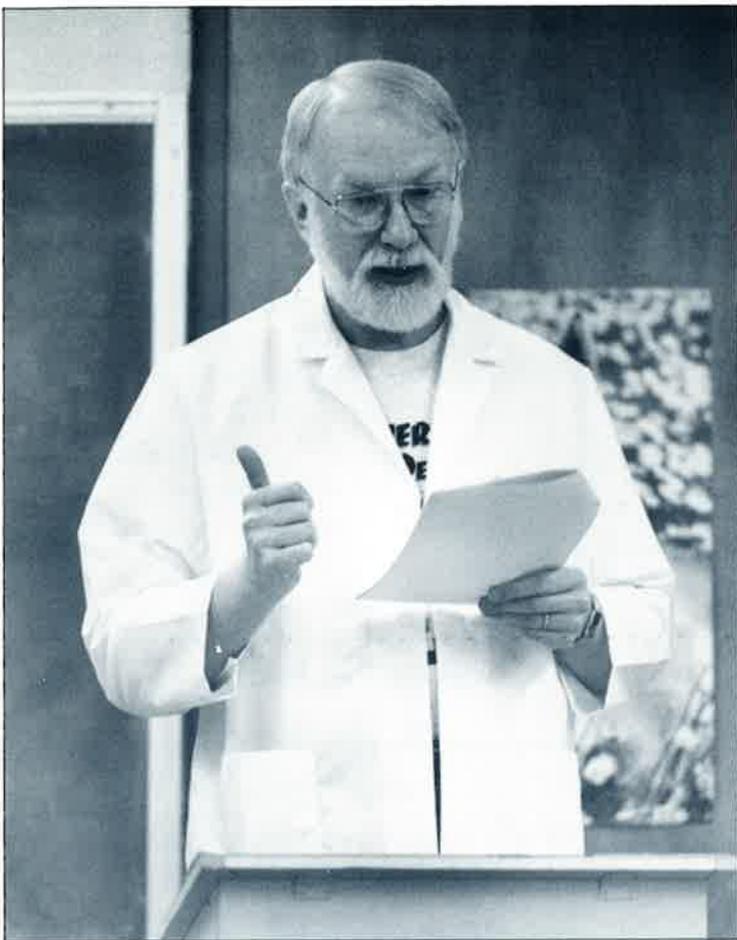
On the cover (clockwise from upper left):

Senior Chemist Robert McCarley (left) and Metallurgist Iver Anderson (right) field a tricky question in their roles as scorekeeper and moderator.

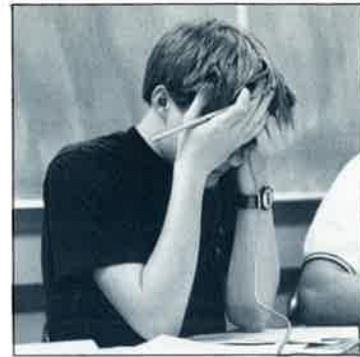
Ames Lab Science Bowl first-place winners from Des Moines Lincoln confer on the answer to a bonus question.

"At room temperature, most elements are in which phase of matter?" Otto Buck, materials sciences program director, poses yet another question to science bowl competitors.

Senior Chemist Dennis Johnson reviews science bowl rules as Associate Chemist Stephan Weeks sets the timer for the impending match between Davenport West (left) and Des Moines East (right).



Ames Lab Senior Chemist Dennis Johnson gives a "thumbs-up" for another correct answer.



Ankeny science bowl team member, Steve Jens, ponders a question, agonizes over its solution and receives some good-natured needling from his twin brother, Dean.



Ames Lab Director Tom Barton presents the winner's trophy to Des Moines Lincoln team captain, Jason Quick, as team sponsor, Ed Pilkington (far left) looks on. Other team members from left to right are: Michael Deierling, Steve Ryan, Matt Allen and Jonathan Kessel.

James Coronas will step down as Deputy Director of the Laboratory this month but will continue as program director of the Applied Mathematical Sciences Program and acting director of the Environmental Restoration and Waste Management Program. Future plans for the Deputy Director position have not been determined.

During Pat Thiel's faculty improvement leave from June 1 through December 31, John Corbett will be the interim program director of Materials Chemistry.

The Chemical Sciences Program Review will be held on May 20-21 in 301 Spedding. During the two morning sessions, 45-minute research presentations will be given by Ames Lab scientists Bernard Gerstein, R. Samuel Houk, Andrew DePristo, Gerald Small, Nenad Kostic, and Walter Trahanovsky. The afternoons are reserved for individual discussions between reviewers and principal investigators. For more information or a schedule, contact Nancy Anderson, administrative assistant, at 4-5048 or Kris Voga, secretary, at 4-2327.

Ames Lab 1991 Veishea Display:

Friday, May 3 - 9 a.m. to 5 p.m.

Saturday, May 4 - noon to 2 p.m.

Third floor Spedding Hall

Conference Room

Stop and view a sampling of the Lab's research.

Effective April 1, 1991, the per diem rate for travel was increased to \$30 per day. The rate for extended work assignments off-site was increased to \$45 per day.

In an effort to limit the use of pesticides in the Laboratory, spraying will continue to be done after hours but will be limited to major problem areas. The Lab is considering placing this task in the hands of a commercial firm.

The very best way to maintain a problem-free area is to practice good housekeeping. Deposit food and beverage containers in appropriate disposal units. Prior to last year's OSHA inspection we initiated a policy in which the custodians collected empty pop cans left overnight in the Laboratory. This helped to reduce the accumulation of cans in certain areas but made extra work for the custodians. Each Ames Lab employee should assume responsibility for policing his/her own area for empty cans and food scraps.

With your cooperation, we should be able to reduce the amount of pesticide spraying required and still control the pests. Please contact Facilities Services at 4-3756 if you have any questions or comments regarding this policy.

The Marriott Fairfield Inn recently opened in Willowbrook, Illinois. Located approximately one block from the Willowbrook Holiday Inn, the Marriott Fairfield Inn is a very nice facility with a special rate of \$34.95/single for visitors to Argonne. The phone number for reservations is 708/789-6300.

Ames Lab/IPRT personnel may now request new standing reservations for usage of the third floor Spedding Hall conference rooms for the upcoming 1991 summer session. (Reminder: Standing reservations are only accepted for one-semester periods.) Call Jeanine Crosman in the Engineering Services Office at 4-3757 to arrange reservations.

Ames Lab Group Photo

When: Friday, May 10

Where: Link steps (south)

**Time: 1:10 Administration and Operations
1:20 Science and Technology**

Rain date: Monday, May 13 - same time and place

Who began her freshman year in college with plans to be an English teacher...

until something tugged at her heart? Having spent two of her high school years working part-time as a nurses aide, Karen Burk found she was missing the hospital atmosphere. Changing plans, she let the chalk dust settle on her teaching career and left for St. Joseph Mercy School of Nursing in Mason City, Iowa.

Burk's biography will appear in the 1990-1991 edition of *Who's Who In American Nursing* when it's published in June. Commenting on her reaction to being selected, Burk says, "I think of it as an honor; a *Who's Who* is kind of important. I'm probably the only person in *Who's Who In American Nursing* around here," she teased.

Burk says she's not sure how she was selected to receive application materials for *Who's Who*. Initially, she thought the form was from the Iowa Nursing Board and pertained to renewing her license. "I filled out the whole form before I discovered it was from the Society of Nursing Professionals," she says. "Once I had the form



Karen Burk

completed and discovered what it was about, I decided I might as well send it in," Burk continued.

The Society of Nursing Professionals routinely contacts organizations within nursing and health care organizations to obtain names of possible candidates for inclusion in *Who's Who In American Nursing*, according to Michelle Munter of the Society's public relations division. "Additionally, previous entrants will often nominate one of their colleagues," Munter says.

Acceptance of her biography recognizes Burk's

contributions to the nursing profession over a twenty-seven year career. During the part of her career spent in hospital nursing, Burk specialized in emergency room (ER) work. "I enjoyed ER because there was always something different happening; it's an environment in which you must respond quickly and use your head," she notes.

Asked how occupational medicine nursing compares to the excitement of ER nursing, Burk says she definitely finds occupational medicine to be as exciting. "It's different than other types of nursing because it is prevention-oriented," she explains. "It's challenging and rewarding to be able to keep a body healthy so you don't have to fix it!" Burk is known for helping Ames Lab employees keep their bodies healthy by planning weight control programs which offer menu tips, exercise advice and a hearty amount of encouragement.

Occupational medicine nursing means answering a lot of health-related questions. "You need to know where to look to find the answers to those questions," says Burk. Patient education is a feature of occupational medicine nursing that she enjoys most

because of its ongoing nature. It requires interacting with a wide variety of people and becoming sensitive to them as individuals. "You must know how to read people," Burk smiles, "because you see them over and over."

Relaxing from the duties of the nursing profession, Burk enjoys golf and almost any kind of outdoor work. Getting exercise is no problem for her; she usually walks four to six times a week, averaging three miles each time.

Burk also has quite an unusual hobby. She loves to watch television commercials. When most of us are taking those two or three commercial minutes to raid the refrigerator, Burk is entertained by the clever art of advertising. Perhaps harkening back to her desire to be an English teacher, she finds herself collecting catchy phrases that have a deeper meaning. The final comment from a commercial for a popular athletic shoe is one of her favorites and defines a philosophy she lives by: "There is no finish line." □

May 6-12 is designated National Nurses Week by the American Nurses Association.

NEW EMPLOYEES

Kate Galligan,
Research Advisor
(Bernard Gerstein)

Ashok Kumar Ganguli,
Postdoctoral Fellow
(John Corbett)

Xia Gu,
Engineering Aide
(Mark Godar)

Kirk Larson,
Research Helper
(Bernard Beaudry)

Gordon Miller,
Associate
(Mike Crow)

Uwe Myler,
Postdoctoral Fellow
(Pat Thiel)

A. A. Nanayakkara,
Postdoctoral Fellow
(Andrew DePristo)

Shukichi Ochiai,
Visiting Scientist
(John McClelland)

Hiroyuki Takeya,
Postdoctoral Fellow
(Karl Gschneidner)

Fujie Zhang,
Postdoctoral Fellow
(Tom Wheelock)

PROMOTIONS

Bogdan Slomka from
Postdoctoral Fellow to
Associate Chemical

Fifth Iowan Elected to National Academy of Engineers

An Ames Lab program director became only the fifth Iowan and the second ISU faculty member to be elected to the prestigious National Academy of Engineers. Donald O. Thompson, director of the Center for Nondestructive Evaluation (NDE) and the Federal Aviation Administration (FAA) Center for Aviation Systems Reliability (CASR), will be formally inducted into the Academy during ceremonies on October 2 and 3 in Washington, D.C. Election to the Academy is one of the highest honors awarded in the field of engineering.

"I'm very pleased, both personally and professionally, to be recognized by my peers," Thompson smiled proudly. "I hope it brings recognition to the Ames Lab and to the University."

According to distinguished professor Jack Cleasby, elected eight years ago and ISU's only other member of the Academy, the award is based on 1) significant contributions to engineering theory and practice and to the literature of engineering, and 2) the demonstration of unusual accomplishment in the pioneering of new and developing fields of technology. "I'm delighted to have a colleague in the Academy," Cleasby added.

Created in 1964, the National Academy of Engineers has about 1526 mem-



Don Thompson (left) visits with Ames Lab Director Tom Barton during a recent reception honoring Thompson's election to the National Academy of Engineers.

bers elected for their distinguished contributions to the development of engineering and its leadership. It shares with the National Academy of Sciences the responsibility of examining and reporting to the U.S. government on science and technology issues.

Thompson has pioneered the relatively new area of quantitative NDE. He helped develop ways to measure quantitatively the detection and characterization of flaws and imperfections using inspection techniques like ultrasound and lasers that allow engineers to better examine and probe new and aging structures and materials for invisible problems.

"One of my career goals," Thompson says, "was to develop the scientific base for NDE, to raise it to the level of an engineering and scientific discipline. I think we've made a great deal of progress toward meeting that goal."

Thompson, a graduate of

Clear Lake (Iowa) High School, earned his bachelor's, master's and doctoral degrees at the University of Iowa. He did research on radiation damage at the Oak Ridge National Lab for 10 years. Before coming to Ames Lab in 1979, he worked at Rockwell International in Thousand Oaks, California, where he was director of structural materials research.

During a recent reception recognizing Thompson's accomplishments, Interim President Milton Glick remarked, "This award brings honor to you, Don, as well as to us." Friends and colleagues from around the country sent Thompson many letters of congratulations. Accolades included "a well deserved honor for one who has contributed so much to the future of materials" and "membership in the Academy is a very distinguished honor

bestowed only upon those who have made truly significant contributions to technology and mankind." Perhaps Jan Achenbach, director of Northwestern University's Center for Quality Engineering and associate director of Ames Lab's new FAA Center, expressed it best during Thompson's reception when he said, "Don is a highly respected individual and admired by everyone in the field. I can't think of anybody that deserves it more." □

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*Address correction requested
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