

INSIDER

Newsletter for the Employees of Ames Laboratory ■ Volume 18, Number 6 ■ June 2007

American Red Cross Blood Drive Nets 45 Units

Ames Lab and IPRT drive draws 22 first-time donors

Ames Laboratory and IPRT community members helped save a life at the on-site American Red Cross blood drive on June 15.

According to Carol Mack, medical administrator in Occupational Medicine, the Ames Lab/IPRT blood drive collected 45 units of blood. “After each unit of blood is separated into three parts, the blood collected at the Ames Lab and IPRT blood drive will potentially save up to 135 lives,” says Mack.

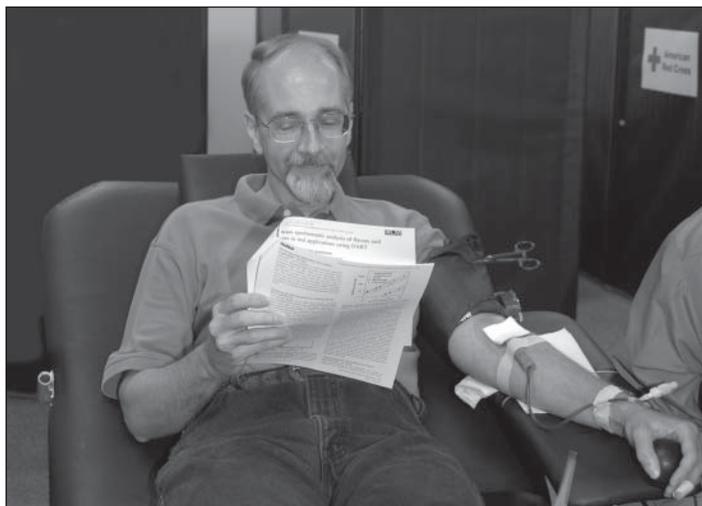
First-time donors donated nearly half of the units collected at the drive. “First-time donors are important because they are the key to maintaining a stable blood drive in the future,” says Mack.

In addition to the donors, seventeen employees volunteered their time during the drive, helping with check-in, serving as donor escorts and staffing the canteen. “Thanks to the Ames Lab and IPRT employees for showing their support by donating and volunteering at the recent American Red Cross blood drive,” says Mack.

All donors and volunteers at the blood drive received a scratch-off card with a chance to win an iPod or flat-screen TV. No word yet if any Ames Lab or IPRT staffer won a prize. But we know for sure the blood donations are saving lives, and that’s a pretty good reward all on its own. ■



Cynthia Feller checks in Greg Baker, Science Undergraduate Laboratory Internship participant, at the registration table.



Roger Jones catches up on a little reading as he donates blood.



Mike Porter (left) and David Baldwin regain their strength at the canteen.



Baebler Named Ames Site Manager

Cynthia Baebler has been named the new Ames Site Office Manager for the Ames Laboratory. Baebler's appointment was announced June 11, by George Malosh, chief operating officer with the DOE Office of Science.

Baebler has 20 years of diverse experience working for the federal government in the Department of Energy and Department of Defense. She served five years at DOE Headquarters in the Defense Programs and Environmental Management offices before moving to Chicago to lead the Waste Management program. Following that assignment, she was the federal project controls manager for the Pit Disassembly and Conversion Facility design project, a \$2.5 billion program



funded by the National Nuclear Security Administration.

Most recently, she has been working for the Office of Science's Chicago office, providing project-management services in support of site-office needs. ■

Luban Awarded Honorary Doctorate



Luban, who is also an ISU professor of physics and astronomy, is the first to be awarded an honorary degree from the University of Osnabrück's Department of Physics.

The award citation reads "On the background of distinguished lifelong scientific achievements, Marshall Luban has substantially promoted the field of molecular magnetism by his own work as well as by initiating international cooperations."

A celebratory colloquium was also held by the University of Osnabrück in 2006 to honor Luban. ■

Marshall Luban, Ames Laboratory senior physicist, received an honorary doctorate from the University of Osnabrück in Osnabrück, Germany, on June 22, 2006.

New Employees

- Sushil Auluck, Visiting Scientist (Vladimir Antropov)
- Marcus Diem, Postdoctoral Fellow (Costas Soukoulis)
- Shalabh Gupta, Postdoctoral Fellow (John Corbett)
- Shaogang Hao, Postdoctoral Fellow (Cai-Zhuang Wang)
- Julia Herrero-Albillos, Postdoctoral Fellow (Karl Gschneidner)
- Roustem Khassanov, Postdoctoral Fellow (Adam Kaminski)
- Sang-Kwon Na, Postdoctoral Fellow (Tom Shih)
- Garima Sharma, Postdoctoral Fellow (Rohit Trivedi)
- Zhihong Song, Postdoctoral Fellow (Basil Nikolau)
- Bruce Spire, ERD Machinist (Terry Herrman)
- Srinivasa Thimmaiah, Postdoctoral Fellow (Gordon Miller)
- Qingfeng Xing, Postdoctoral Fellow (Tom Lograsso)
- William Yuhasz, Postdoctoral Fellow (Tom Lograsso)

George Kraus Named IPRT Director



George Kraus will be the new director of the Institute for Physical Research and Technology. He begins his new position July 1, 2007, and will work three-fourths time as director. He will also continue his faculty position in the department of chemistry at Iowa State University. Kraus and the Ames Laboratory director will report directly to John Brighton, Iowa State's Vice President for Research and Economic Development.

Kraus has been the director of IPRT's Center for Catalysis as well as a university professor of chemistry at Iowa State University. He has been at Iowa State since 1976 when he joined the department of chemistry as an assistant professor. He has held other

administrative positions, including department chair of chemistry from 1993 to 1999 and more recently as assistant director of the Bio-related Initiatives of the Ames Laboratory.

Brighton said he and the search committee were very impressed with Dr. Kraus' academic credentials and his leadership experience over a long period of time.

Kraus received his bachelor's degree from the University of Rochester and his doctorate from Columbia University. He has had a strong research record with interests in new synthetic reactions and their application to the synthesis of biologically active natural products, forensic chemistry, green chemistry and biobased products.

Kraus said he is honored to become the director of this unique enterprise and looks forward to building upon the solid foundation laid by Tom Barton, former director of both IPRT and the Ames Laboratory.

Victor Lin, a professor of chemistry at Iowa State, will take over Kraus's position as director of IPRT's Center for Catalysis. ■

Qin Wins Best Poster Prize



Feili Qin, Ames Lab research associate, won the first-place best poster prize at the Physical Electronics Conference 2007 on

June 21 at the University of Illinois in Urbana, Ill. The best poster prize was awarded based on the quality of the technical content of the poster combined with the clarity of the presentation.

Qin's prize-winning poster was titled "Addition on the Clean Surface and Oxidation Behavior of Ni₃Al(111)" and was co-authored with Jim Anderegg, Cynthia Jenks, Brian Gleeson, Dan Sordelet and Patricia Thiel. Qin is a member of Thiel's research group. ■

Promotions

- John Clough to Chief Accountant
- Pat Jenkins to Assistant Chief Accountant



Ames Lab Scientists Win ISU Awards



Jörg Schmalian, Ames Laboratory senior physicist, has been named a recipient of a 2007 Iowa State University College of Liberal Arts and Sciences Mid-Career Award for Excellence in Research. Schmalian, who is also an ISU professor of physics and astronomy, is one of only two LAS faculty members to receive the award this year.

The LAS Mid-Career Award for Excellence in Research recognizes faculty members who have a national or international reputation for contributions in research and who have influenced the research activities of students. Schmalian will accept the award at the LAS convocation on Sept. 5.



Sam Houk, Ames Laboratory senior chemist, has been named the winner of the 2007 Iowa State University Margaret Ellen White Graduate Faculty Award. Houk, who is also an ISU professor of chemistry, will receive the award at the university convocation in the fall.

The Margaret Ellen White Graduate Faculty Award recognizes superior performance by a member of the graduate faculty, who serves as a mentor and who enriches the student-professor relationship through support and attention to detail, enabling students to finish their work in a timely and scholarly manner. The award was established in 1985 by White, a graduate and staff member of the former ISU College of Home Economics, to show her appreciation to graduate faculty for their guidance and encouragement of graduate students.



Mei Hong, Ames Laboratory associate, has received a 2007 Iowa State University Award for Mid-Career Achievement in Research.

The ISU Award for Mid-Career Achievement in Research recognizes a faculty member who has demonstrated outstanding accomplishments in research at the mid-career stage. Hong will accept the award at the university convocation in the fall.

Hong, the first ISU John D. Corbett Professor of Chemistry, has been a faculty member since 1999 and an Ames Laboratory associate since March. Her research interests center on the development and application of solid-state NMR spectroscopy to investigate the structure and dynamics of membrane proteins and insoluble fibrous proteins. ■

Thompson Wins ASNT Research Award for Sustained Excellence



Bruce Thompson, Ames Laboratory Nondestructive Evaluation program director, has won the 2007 Research Award for Sustained Excellence from the American Society for Nondestructive

Testing's Research Council. Thompson was nominated by Kevin Smith, manager of advanced NDE at Pratt & Whitney Canada. In addition to highlighting Thompson's significant research achievements, mentoring of students and excellent academic credentials in his nomination letter, Smith also recognized Thompson for his exceptional capability to perceive the possibilities for how theoretical concepts can be applied to industrial concerns. "Few individuals possess the depth of knowledge and the ability to transform that knowledge into useful information as Bruce Thompson," Smith said in his nomination. ■

Science Bowl Receives Donation from Sauer-Danfoss



Sauer-Danfoss, Inc. of Ames presented a check for \$1,000 to the 2007 Science Bowl program. Matt Bendler, Human Resources director for the Americas Region, presented the check to Steve Karsjen, Ames Laboratory/ISU Science Bowl coordinator, on April 10.

In presenting the check, Bendler said how pleased Sauer-Danfoss was to join in supporting a program that reaches out to excite young people about science and math. "The Science Bowl program is a great way for Sauer-Danfoss to support the development of science and math skills in a very fun and competitive environment," Bendler explained. "We're very proud to be part of this event."

Sauer-Danfoss is the eighth corporate partner to sponsor the Science Bowl program. ■

New Ink Sampling Technique Takes a Bite Out of Time

Midwest Forensics Resource Center builds library of forensic ink profiles

Researchers at the Midwest Forensics Resource Center are building a library of ink profiles to help forensic scientists identify inks on fraudulent documents and other evidence. MFRC scientists will pair mass spectrometry with a new sampling technique called Direct Analysis in Real Time (DART) to reveal the chemical makeup of ink faster and in greater detail than ever before.

DART mass spectrometry analyzes ink by creating a stream of warm gas containing excited-state helium atoms or nitrogen molecules in the DART source. The gas stream is pointed at an ink sample, and the gas and excited-state species evaporate and ionize molecules from the sample. A mass spectrometer measures the production of ions to create mass spectrum data for each ink sample tested.

In contrast to other types of ink analysis, like liquid chromatography, which require cutting a small sample from a questioned document, DART mass spectrometry is able to test documents without physically or visually altering them. The document is open to the environment, and all sizes of

materials may be tested in their original form.

According to Roger Jones, Ames Lab associate chemist, "The great thing about the DART system is that it can sample the ink straight off the paper. You don't have to extract a sample first. Before DART, we had to cut a little bit of the sample out and dissolve it in solvent for analysis. So, now we can look at the document without visibly altering it, which is good for forensic science. We don't destroy the evidence."

Eliminating the sample extraction process saves busy forensic scientists time. Jones says that benefit alone would have been enough to consider the DART method a success.

"We would have been satisfied with the mass spectra looking basically like the spectra obtained by the old extraction mass spectrometry methods, because the DART system still gets around damaging the sample and reduces the work involved in analysis," says Jones, "Time constraints are the major complaint of every forensic scientist. Their caseloads are so large that they just don't have the time to do traditional ink analysis."



Susan Lorge, research associate, prepares a sample for testing in the DART sampling system.

But, on top of saving time and preserving evidence, the DART method also yields richer data about ink samples than previous sampling methods. Initial tests of the DART system indicate that the mass spectra reveal more components of the ink than conventional mass spectra. Using DART, forensic scientists may be able to differentiate between inks like never before.

Jones and John McClelland, Ames Lab senior physicist and DART project leader, plan a three-phase project. Currently in the first phase, they are experimenting to determine the best way to analyze inks and build the library.

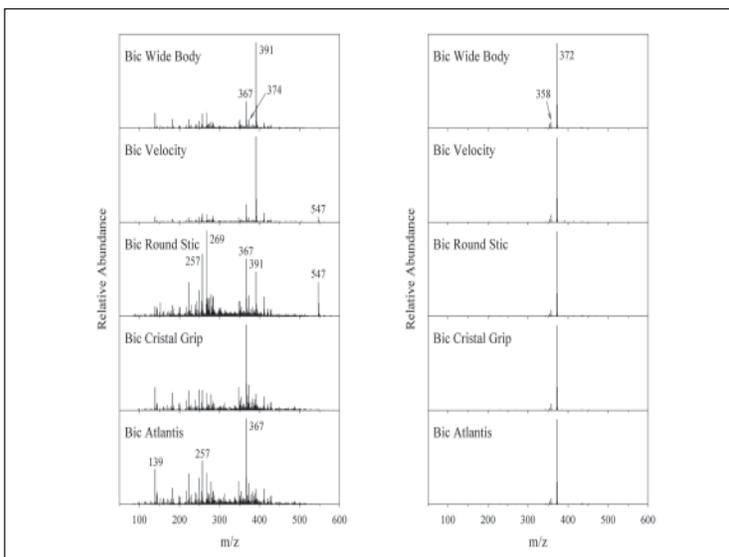
The library of ink mass spectra will be produced in the second phase of the project. Researchers will use samples from the U.S. Secret Service International Ink Library to create a comprehensive, evaluated, and computer-searchable library of mass spectra of the more than 8,000 inks the Secret Service has compiled.

The third phase of the project will focus on creating computer software to store and access the mass spectra library.

"Commercial mass spectrometry software available today is all based on the old style of mass spectrometry. We get a different type of data from DART. So, the assumptions used in existing software for searching and matching mass spectra do not work the best for DART," says Jones.

The U.S. Department of Justice's National Institute of Justice is funding the project. ■

~ Breehan Gerleman



On the left are mass spectra from five different black Bic ballpoint pens analyzed using the DART mass spectrometry technique, and on the right are the same five inks analyzed using conventional mass spectrometry.

DART System Made Guest Appearance on CSI

In 2005, the DART mass spectrometry system appeared on an episode of the popular crime show "CSI: New York" where it was used to analyze a piece of material stuck to tape that was used to bind a pilot on a hijacked helicopter. DART helped the fictional forensic scientists identify the mystery material as part of a latex glove, which led to a partial finger print, which, after a couple more plot twists, pointed to the culprit. ■

Lab's 60th Bash Was Wet, Wild and Wonderful!

From dunking to dancing, employees had a terrific time



Some hep 50s dolls show off their poodle skirts and wheels. (from left: Audrey Hohanshelt, Vickie Hahn and Deb Samuelson)

So it rained – so what! The weather was lousy, but the 60th anniversary celebration on May 24 came off as planned and in great style. A big thank you goes to the Lab's remarkable facilities crew who literally transformed the mechanical maintenance building into the perfect party room. And there were lots of partygoers on hand in the huge, spick and span garage to enjoy the occasion that marked 60 years of scientific excellence at Ames Laboratory.

Highlighting the activities at the 1950s-themed event was the very popular dunk tank, where, for a mere buck, employees could try out their pitching skills in hopes of dunking a few of their good-natured coworkers. Proceeds from the dunk tank came to \$278, which will be donated to this year's holiday auction charity (yet to be selected). Rounding out the entertainment, a 50s dance band kept things "hopping" throughout the afternoon. An ice-cream sundae bar with cake provided more "fuel" for the partiers as well as the opportunity to sit and visit with one another and the many retirees who showed up for the day's festivities.

The 60th anniversary celebration is the last installment of the *Insider's* Ames Laboratory time line that has featured many of the Lab's outstanding science achievements by decade. Although you won't find science in this final installment, you will find something just as important – a "picture" of our Ames Lab family, a family that stretches out over 60 fabulous years. We've mastered the give and take of both working and playing together that has made our family unit the remarkable success it has become and will continue to be.

So here we are, folks. There's a whole lot that can be said for us, but as we turn the last few celebratory pages on this phase of our history it seems appropriate to say Ames Lab is one family that definitely knows how to have a good time! ■

~ Saren Johnston

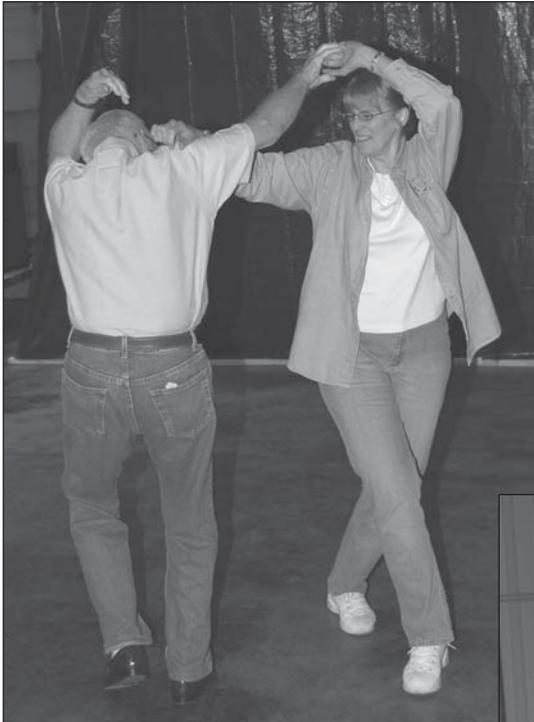


Richie Lee and the Fabulous 50's keep the party rocking with great tunes from the 1950s.

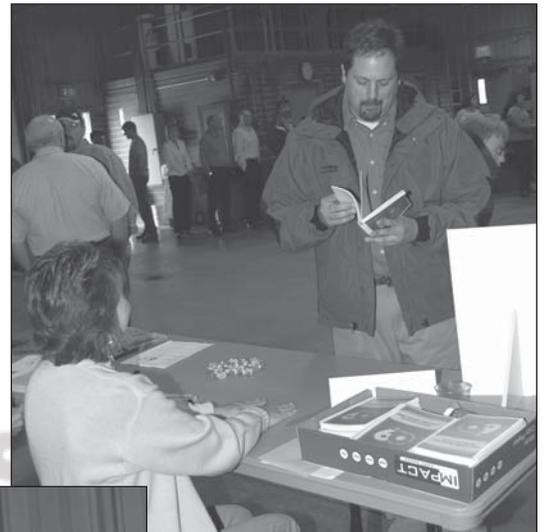


No explanation needed. (Steve Karsjen)

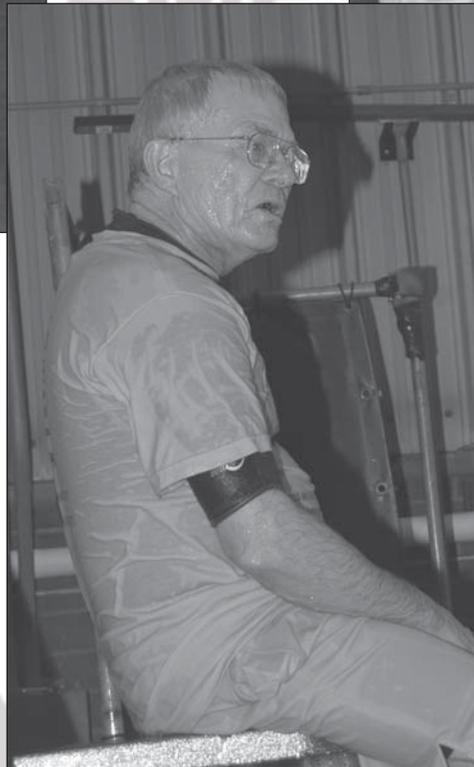
Scenes From the 60th Anniversary Celebration



Saren Johnston and Ames Lab retiree Bob Staggs swing out to the music of Richie Lee and the Fabulous 50's.



Stacy Joiner talks up the Ames Laboratory 60th anniversary cookbook to Trevor Riedemann.



We can only speculate what a soaked Tom Barton was saying when this picture was taken, but it might have gone something like this. "Cold, you darn right it's cold! Who signed me up for this? I'll sic Goldman on them!"



Partygoers walk the Ames Lab time line, taking in the highlights from the 1940s through today.



It's a sure bet that Saren Johnston is right on target to dunk Alan Goldman.



Picking up cake and building their own ice-cream sundaes are, left to right: Cindy Betts, Marian Lebo, Rickie Wheeler, Mike Dotzler and Jan Ahrens.



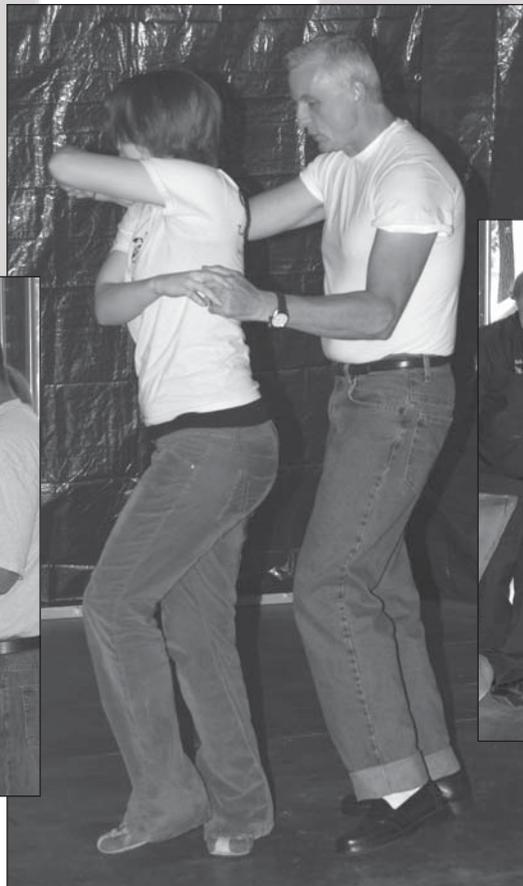
Rebecca Shivvers shows off "sponsor" stickers created by her office coworker Larry Stoltenberg to reflect some aspect of the sponsoring physicist's research. A few of our favorite sponsor stickers include:

- We'll scatter your neutrons. (David Vaknin)*
- OLED – Coming to a screen near you. (Joe Shinar)*
- We're hot for low temps. (Ruslan Prozorov)*



Retirees Tom Johnson (left) and Dale Knutson catch up with one another at the 60th anniversary celebration.

Rebecca Shivvers holds her nose in preparation for her next drop to the bottom of the dunk tank, a trip she made 20 times. Shivvers increased the \$20 she earned from those dunkings by contributing two dollars for every dollar spent to dunk her, making a grand total of \$60 that will go to this year's holiday auction charity.



Steve Karsjen "cuts a rug" with 50s dance instructor Sarah Carney.



Mike McGuigan collects "dunk" money from Sandi Bishop and Alan Goldman.



Rich Malmquist means business as he gets ready to send a fearless volunteer to the bottom of the dunk tank.



Breehan Gerleman (standing) and Saren Johnston check out the 1953 International pickup truck parked on display at the Lab's warehouse. The pristine vehicle still sported an "I Like Ike" presidential banner.



Bob Mills shows Andreja Bakac how to fold up the 60th anniversary pop-up flying-disk souvenirs. In fact, Bob spent most of the afternoon helping people learn the somewhat tricky procedure.

Dance instructors Mary Woodruff (left) and Sarah Carney lead employees in the Madison, a popular dance of the 1950s.



From his high, wet perch, Tom Wessels taunts the next person who tries to dunk him.



Mark Grootveld looks a little less dapper now that the spiff has gone out of his suit. He gets the award (if there was one) for the best-dressed dunkee, even though his GQ look came from the Goodwill Store and cost only five dollars.

Science Undergraduate Laboratory Internship Program Begins 3rd Year

Eleven students work alongside Lab scientists

Ten weeks of intensive scientific research kicked off on May 29 for 11 undergraduate interns who are at Ames Laboratory and Iowa State University this summer to participate in the Science Undergraduate Laboratory Internship program, which is sponsored by the DOE Office of Science. SULI is a nationwide program that brings students interested in careers in science and engineering into DOE laboratories to conduct research under the mentorship of laboratory scientists.

Fifty students applied for the Ames Lab internship program this year. The 11 who were selected are from Missouri Academy of Math, Science and Computing; Maryville, Mo; Carleton College, Northfield, Minn.; Brigham Young University, Rexburg, Idaho; Virginia Polytechnic Institute and State University, Blacksburg, Va.; Central College, Pella, Iowa; Northwestern University, Evanston, Ill.; Pennsylvania State University, University Park, Pa; Albion College, Albion, Mich.; University of California, Berkeley,

Calif.; Grinnell College, Grinnell, Iowa; and Manchester College, North Manchester, Ind.

Scientists serving as mentors this year are Justin Satrio, Eric Cochran, Paul Canfield, Bill McCallum, Alex Traveset, Michael Tringides, Ruslan Prozorov, Surya Mallapragada, George Kraus, Gordon Miller and Shankar Subramaniam. This is Tringides second year as a mentor.

By the end of the 10-week internship on Aug. 3, the SULI students will be required to have completed a research paper or PowerPoint presentation and to have participated in a poster display. Papers will be submitted either to the *DOE Journal of Undergraduate Research* or another journal of theirs and their mentor's choosing.

Besides working in their mentors' labs, students will visit other research labs, listen to science talks and experience some of Iowa's extracurricular activities. "It will surprise no one to hear that we would like to see these students choose Iowa State for gradu-



SULI students include (kneeling, left to right) Fiona Mills-Groninger, Thomas Brenner and George Scott; (standing, left to right) Andrew Fidler, Brian Langstraat, Tim Pica, Dustin Bales, Matthew Cromwell, Chris Knorowski, Joshua Weber and Greg Baker.

ate school," says Steve Karsjen, SULI program coordinator, "so we'll do our best to provide them a well-rounded, positive experience in Iowa and at Ames Laboratory and Iowa State."

This year marks the third year for the SULI program at Ames Lab and Iowa State. ■

~ Steve Karsjen

Central Academy 6th at National Middle School Science Bowl

Middle school students from Central Academy of Des Moines finished sixth at the National Middle School Science Bowl in Denver, Co., on June 24. Thirty teams from across the U.S. competed in the event that Honey Creek Middle School of Terra Haute, Ind., won for the third year in a row.

The Central Academy team of Luchang Wang, Younan Zhu, Alick Feng, Ian Pierson, and Kenny Suh advanced from the round-robin competition to make the final field of 16 teams. The team lost its first match, then won the next three before being eliminated by the eventual fourth-place team, ACCESS of Portland, Ore.

Central Academy, coached by Anthony Voss, brought home a check for \$500 for placing sixth. Central Academy earned the right to compete at the National Science Bowl by winning the Ames Laboratory/Iowa State University regional competition held April 13-14. ■



The Central Academy team rests during a hike in the mountains on their trip to Colorado for the National Middle School Science Bowl competition. Pictured are (left to right) coach Anthony Voss, Ian Pierson, Kenny Suh, Younan Zhu, Alick Feng and Luchang Wang.

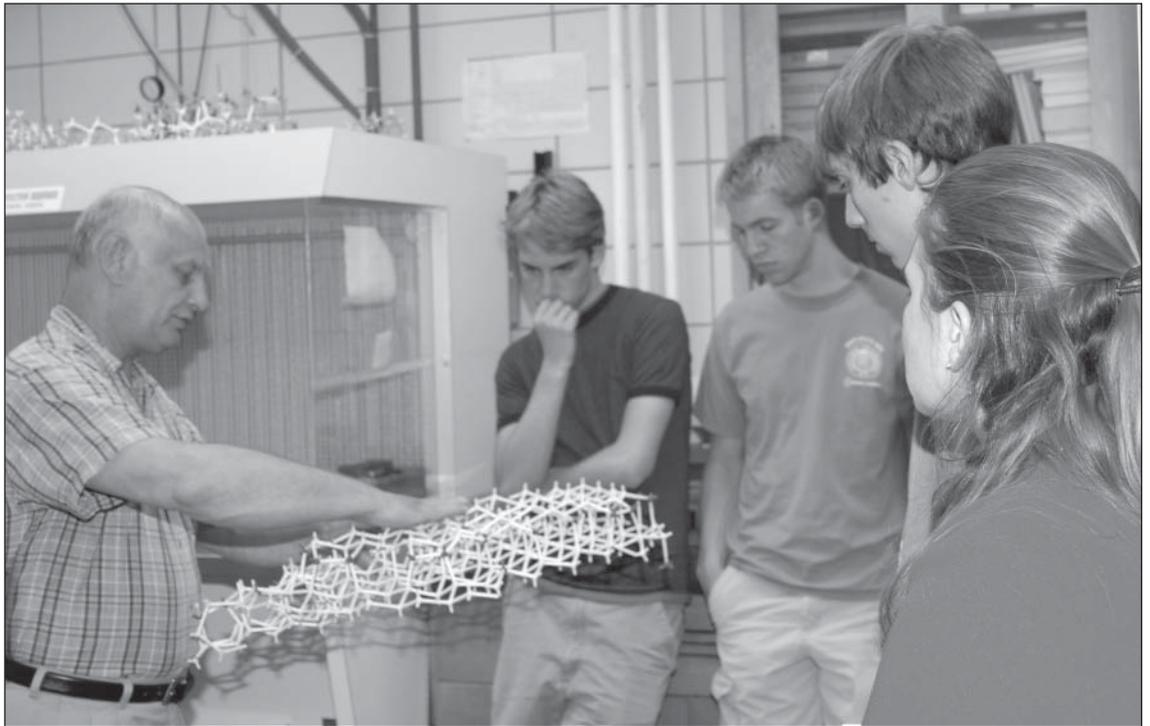
Let's Talk Physics

Ames High students visit three of the Lab's physics research groups

It's not often that the opportunity to host 15 advanced physics students comes along, so when it does, you grab it, especially if you're a physicist yourself. And that's exactly what Ames Laboratory associate scientist Myron Hupalo did. When Ames High School physics teacher Mike Lazere asked Hupalo if he could bring students from his advanced physics, or AP, class to visit Ames Laboratory, Hupalo didn't have to think twice before saying yes. He saw the request as an excellent opportunity to share some exciting research efforts with the youngsters, as well as introduce them to the potential opportunities that both the Lab and Iowa State have to offer.

With some organizational help from Ames Lab's Public Affairs office, Hupalo put together a May 21 visit for the group that included an overview of Ames Lab and the Condensed Matter Physics program by Bruce Harmon, Ames Lab deputy director and CMP program director, and Eli Rosenberg, chair of the ISU physics and astronomy department.

Following the welcomes from Harmon and Rosenberg, the students headed out to visit three of Ames Laboratory's physics research areas. While touring Adam



Myron Hupalo uses a model to show Ames High advanced physics students the crystalline structure of the silicon surface – how atoms are arranged in the periodic crystalline lattice of the silicon surface and how that arrangement affects the properties and surface chemical reactivity.

Kaminski's labs, they were introduced to photoemission, a process in which electrons are pulled out of a sample material using ultraviolet light. In a visit to Paul Canfield and Sergey Bud'ko's research labs, the students learned about the use of single crystals to discover more about the physical

properties of novel electronic and magnetic compounds.

Their final stop took the students to the labs of Michael Tringides and Myron Hupalo, where Hupalo discussed his work with the scanning tunneling microscope that can image individual atoms on electrically conducting

surfaces. He showed the students STM images of the uniform height and self-organized growth of lead deposited on silicon, a research effort within the Tringides group that is leading to more control over atomic-scale structures. ■

~ Saren Johnston



To Honor our Fellow Iowans

You may have noticed that the American flag flown in front of TASF has on occasion been at half-staff in the last few months. The increase in days the flag is at half-staff is a result of an executive order issued by Gov. Chet Culver that states that all American flags on public grounds in Iowa be flown at half-staff when

- a member of the Iowa National Guard is killed in the line of duty
- a member of the Iowa Air National Guard is killed in the line of duty
- an Iowa resident serving in the United States Armed Forces is killed in the line of duty.

The flag is generally flown at half-staff on the day of the service member's internment.

Searching for an Optimal Ethanol Source

Emily Smith using Raman imaging to study corn alternatives

With high-priced gasoline fueling the demand, ethanol production has jumped dramatically, especially in Iowa where 26 ethanol plants are currently in operation with more in the planning or construction stages. While this surge has meant higher prices for corn, it's also meant higher-priced corn-fed beef and the many other products made from corn. There's also concern for the land as farmers move from traditional crop rotation to straight corn production and put marginal land back into production.

To address those concerns, producers are looking for other more cost-effective and sustainable crops. Ames Laboratory analytical chemist Emily Smith is looking at a novel way to help them determine what type of plant material offers the best solution, thanks to a grant this spring from Iowa State University's Plant Sciences Institute that was matched by funds from Ames Lab.

Smith is using Raman imaging to study plant cell structure to determine which crops offer the right combination of cell-wall composition and degradation to maximize the materials' conversion to ethanol. If successful, a simplified version of the test could even be used in the field to determine if plants were at the prime stage for harvest.

"Just like vintners monitor and test the sugar content of their grapes in the field, biofuel producers could potentially use this technology to determine if their crop was at optimal development for conversion to ethanol," says Smith, who is also an ISU assistant professor of chemistry.

The Raman technique Smith uses employs an optical microscope, and specimens are illuminated with a laser beam. As the laser light hits the sample, some of the light is scattered. By analyzing the scattered light with a spectrometer (spectroscope), Smith can easily and quickly determine the chemical makeup of the plant material. A fiber optic bundle placed between the microscope and the spectrometer allows a direct measure of the chemical makeup at any location on the sample being viewed on the microscope.

"This method has several advantages over other analytical techniques," Smith explains. "First, analysis requires very little material, so you can take small samples from a growing plant over time without damaging the plant." This also makes the technique high-throughput.



Smith views a sample of woody material through a microscope. Samples are illuminated with laser light, and a spectroscope reads the scattered light to determine chemical makeup of the plant cell structure.



Ames Lab analytical chemist Emily Smith (right) and her graduate students Kristopher McKee and Chien-Ju (Cherry) Shih are using Raman imaging to study a variety of plant materials that could be used to produce cellulosic ethanol.

Because only very small pieces of plant material are needed and little time is required to prepare samples, multiple samples can be analyzed quickly.

Smith specifically plans to screen the lignin, hemicellulose and cellulose content of biofuel plant stocks, such as switchgrass, *Miscanthus* (a subtropical perennial grass that can grow 13 feet high), corn, and poplar and willow trees. Lignin interferes with enzymatic conversion of polysaccharides to ethanol, so Smith will use the imaging to help select plant stocks that have low lignin content.

"We hope to find out if lignin content changes over time, with different growing conditions, or with different stock material," Smith says, "so we can determine if there is an optimal time to harvest a particular crop."

Plant material for the project will be provided by collaborator Ken Moore, Iowa State University agronomy professor and expert in biomass crop systems.

While the scope of this project will be used to study biofuel crops, Smith says the technology could also be used to study other plant materials, such as those used for pharmaceuticals.

Smith has been using the Raman imaging technology to study animal and insect proteins and said it wasn't a "big leap" to study plant material.

"There is obviously a lot of interest in biofuels right now," she explains. "Given the number of good researchers on campus working in this area, it was an easy decision to get involved in this project."

Smith's work is being jointly funded through a two-year grant from ISU's Plant Sciences Institute and by Ames Laboratory through revenues generated by royalties from other research successes. George Kraus, Ames Laboratory's Director of Bio-related Initiatives and newly named director for the Institute for Physical Research and Technology, called the collaboration a great first step.

"This is a wonderful opportunity to bring the technological expertise of Ames Lab researchers to bear in solving a problem that's a roadblock to moving biofuels to the next level," Kraus says. "We hope to be a partner in similar projects in the future so that other researchers can take advantage of the capabilities that exist within Ames Laboratory." ■

~ Kerry Gibson

Out to the Ballgame, Out With the Crowd

Ames Lab employees root, root, root for the home team at an I-Cubs game

Ames Laboratory employees enjoyed a perfect night at the ballpark on June 15. The occasion was Ames Laboratory night at the Iowa Cubs baseball game against the Memphis Redbirds. The Cubs lost to the Redbirds 4-1, but the whole experience was a “win” for Lab employees and their families who enjoyed hangin’ out together at the ballpark.



Many organizations enjoyed a “night” at the ballpark. Representatives from each of those organizations, in this case Steve Karsjen, Ames Lab Public Affairs, got the chance to throw out a first pitch prior to the game.



Lab employees and their families enjoy being taken out to the ballgame on June 15.



Members of the Ames Lab Science Undergraduate Laboratory Internship, or SULLI, program join Ames Lab employees for a taste of Iowa baseball at the June 15 Cubs/Redbirds game.

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Editor Saren Johnston
Layout Breehan Gerleman

Address comments to:
Editor, **INSIDER**
111 TASF
Ames, IA 50011-3020
515/294-9557
FAX 515/294-3226

Address correction requested
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