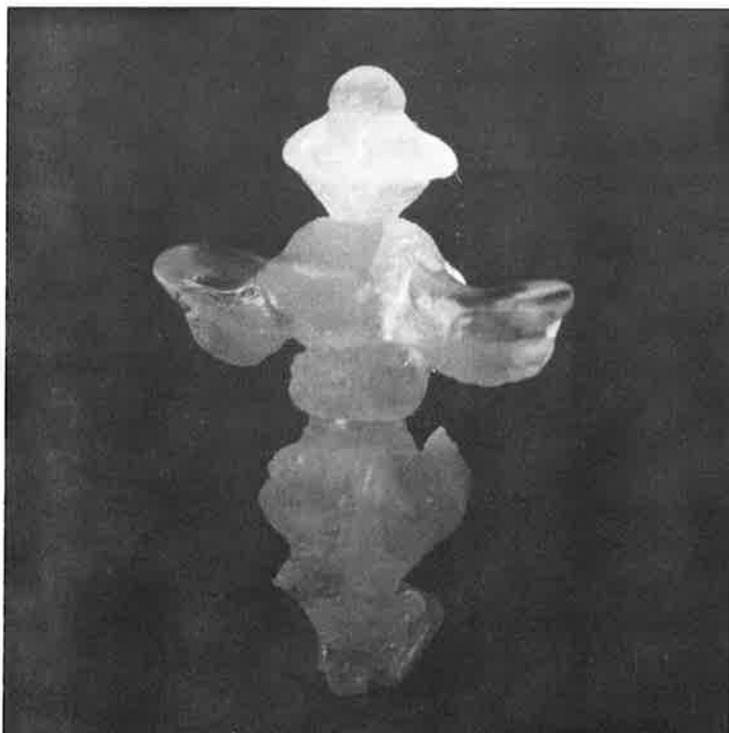
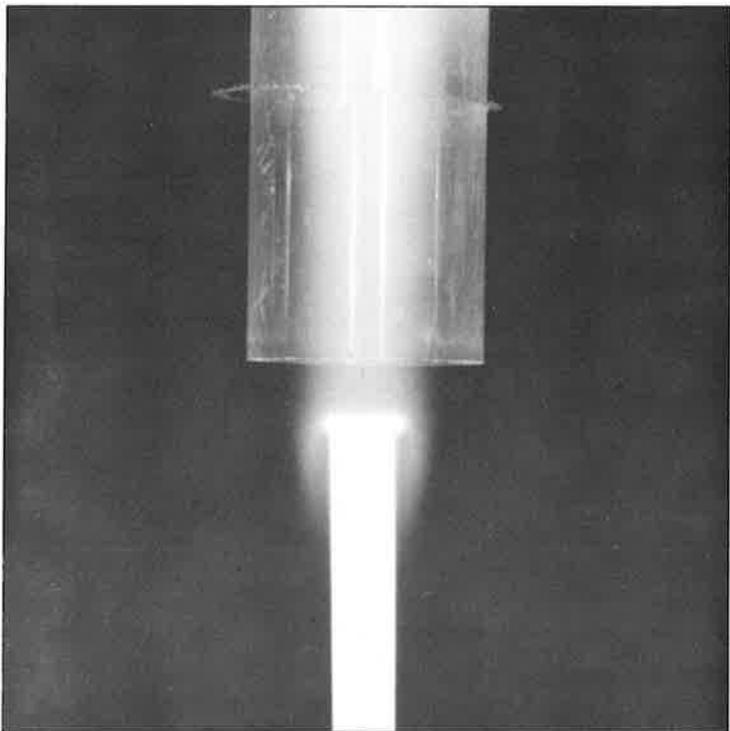


AMES LAB INSIDER



SCIENCE OR SORCERY? - See Page 2.

Science or Sorcery?

The new Molecular Biology Building may have its contemporary gargoyles stationed as rooftop guardians, protective symbols of the mysteries of science, but Ames Lab's Tom Lograsso and summer trainee, Adam Lang, experienced one of those mysteries first hand while growing a single crystal of alumina.

INDUCTIVELY COUPLED PLASMA PEDESTAL CRYSTAL GROWTH sounds like "abracadabra" to many of us non-science oriented individuals, but it is the process Tom is using to grow single crystal boules of alumina. The unique feature of this process is that it is not contaminating and, therefore, keeps the material at a high purity level. Although Tom's work is currently in the developmental stage, he has had some success with his first attempt



Thomas Lograsso

at growing a pure crystal of alumina with a fairly uniform diameter. However, there was a time when a crystal grew that was not exactly what Tom wanted or expected.

On the day the "gene men" statues were installed on the roof of the Molecular Biology Building, some magic was taking place in Tom Lograsso's lab in the neighboring Metals Development Building. Tom grew a crystal

of alumina that differed remarkably from the anticipated shape. The unique crystal appeared to be a miniature clone of the towering gene men. Tom, in the fashion of a true entrepreneur, offered to take orders for the tiny gene men clones. Desktop gargoyles, if you please, positioned at all four corners, was Tom's playful advertising campaign.

We can only speculate about what caused the crystal to form in this unusual way. Perhaps it was a minute piece of DNA, gone crazy, bursting forth from the cascading chain that adorns the sides of the Molecular Biology Building. More likely, it was simply the gene men, themselves, bored so soon with their role as demigods, and engaging in a bit of cosmic sorcery. □

(For those of you who refuse to be dazzled and enchanted by witches, wizards, warlocks, and gene men, the Insider will offer a scientific explanation for the crystal mystery in its next

issue.)

The staff of the Insider wishes to thank Richard Kniseley for bringing this unusual story to our attention.

Saren Johnston

On the cover:

Upper left: Inductively coupled plasma being used to grow an alumina crystal. Alumina powder drops through the plasma where it is melted and accumulated on a pedestal.

Upper right: As the crystal is grown the pedestal is withdrawn from the plasma, resulting in this shape.

Lower left: The shape of the alumina crystal grown on the day the gargoyles were erected.

Lower right: The gargoyle placed on top of the Molecular Biology Building the day the unique crystal was grown.

Lab Employees Shine in Iowa Games

Physical fitness and competition go hand-in-hand for the Ames Laboratory employees that participated in the 1990 Iowa Games. Many medals were won in the multi-sport festival that was created so amateur athletes of all ages and abilities could compete in the Olympic-style events. The Games provide an outlet for positive personal development, and recognize the dedication and achievements

of the athletes.

Catherine Day, a student associate and graduate student in chemistry, won two gold medals for being the fastest swimmer in the 100-yard medley and 50-yard breast stroke.

Day has been winning gold since she started participating in the Iowa Games three years ago. Last year she won five gold medals, and in 1988 she received four. "Winning golds has been easy for me. I plunged into water when I was

just two years old, and have been competing since I was five," Day says with a smile. She also participates in the triathlon (swimming, cycling and running).

Kris Voga, secretary, won a gold medal for criterium cycling, completing laps around the Iowa State University campus in 20 minutes. In road race cycling, Voga won a silver medal, covering 54 miles in 2 hours and 47 minutes. She finished fourth in the 12-mile time-trial.

Voga has been cycling since she was five but started competing only last year. She has improved her record,

receiving a silver and bronze medal in the 1989 Games. She also plays tennis, racquetball and golf.

Sixty-six-year-old James Fritz, senior chemist and professor of chemistry participated in tennis at the Games. "Tennis is the world's finest game and I enjoy playing. It keeps me fit," Fritz says.

Diane Love, secretary, won a silver medal in weight lifting. Participating in the Iowa Games for the first time, Love has been weight lifting for the last eight years.

Andrew DePristo, program director, fundamental interac-

tions, earned a gold medal in men's singles (B group) tennis. A regular participant in U.S. Tennis Association events, DePristo won a silver medal last year.

Jeff Shield, graduate student in material science and engineering, received a gold medal for finishing first in the 5,000-yard race in the 25-29 age group. He plays tennis with his wife Deb and the couple hope to compete in Iowa Games in the future.

William McCallum, senior metallurgist, won three gold medals for swimming in the

50, 100 and 200-yard breast-stroke events.

Allan Russell, associate, won five gold medals. He ran in four racing events and also came in first in the high jump.

RAGBRAI

Three employees were found who participated in RAGBRAI. Joining the annual cycling event were Eugene Pedersen, supervisor, graphics communications; Dennis Sailsbury, photographer; and Chris Adam, research helper, metallurgy and ceramics. The 500-mile seven-day race which

started at Sioux Center on the Missouri river in northwest Iowa, ended at Burlington on the Mississippi river in the southeastern part of the State.

This was the eighth time Sailsbury has ridden in RAGBRAI since he began participating in 1978. "I'm a lifelong resident of Iowa, but you don't really see and experience Iowa until you see it while leisurely riding a bike and you can 'stop and smell the roses.'" Sailsbury's son, Hal, who also works at the lab as a photo specialist, has participated with his dad in

RAGBRAI seven times.

Riding in RAGBRAI for the second consecutive year, Pedersen says, "It's a lot of fun, with food and entertainment in small towns along the route. I joined RAGBRAI to renew old acquaintances and befriend new ones, some of whom could be from many parts of the world."

Adam joined the event this year for the first time and enjoyed it very much. □

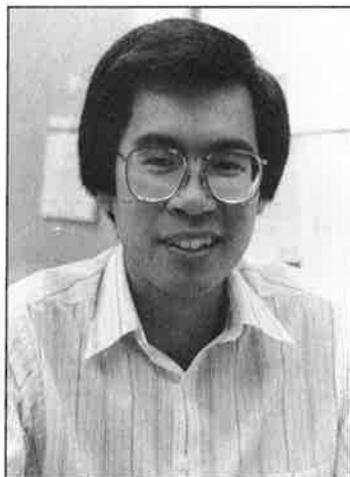
Avinash Pancholi

Woo Named Presidential Young Investigator

Keith Woo, an associate with the Ames Laboratory and an assistant professor in the chemistry department at Iowa State University, has been selected to receive the 1990 Presidential Young Investigator Award.

A letter from the National Science Foundation (NSF) that grants the award states, "The award recognizes your research and teaching accomplishments and your potential as a leader in the academic community.....It acknowledges your outstanding achievements to date and the high expectations the chemistry community has for your future contributions to education and research."

"I was elated when I learned that I had been selected for such a prestigious award," Woo says with a smile. "My nomination was submitted last fall and because it was such a long time before I heard from



Keith Woo

NSF, I assumed that I had not been chosen for the award. It was a pleasant surprise. We are honored that Ames Laboratory and the chemistry department have won three such awards, with the earlier two going to Nenad Kostic and Pat Thiel."

Woo has received the \$25,000 award for the first year. This is the minimum amount the awardee will receive each year for five years. The total amount of the

award could go as high as \$100,000 per year. NSF will match every dollar from industry up to an additional \$37,500. "I hope to raise the industrial support. We could broaden our research and increase the number of graduate assistants in my group," Woo says. At present Woo's team has four graduate assistants and one post-doctoral fellow.

Born in Montana, Woo came to Ames Laboratory and ISU as an assistant professor in the fall of 1986. He earned his doctorate from Stanford University in Palo Alto, California and was a postdoctoral fellow at the University of Wisconsin, Madison. He also studied in England for a year as a Thomas J. Watson Fellow.

Woo, an inorganic chemist, is a principal investigator in Pat Thiel's materials chemistry program. He teaches courses both at the graduate and undergraduate levels. Research and teaching have gone hand in hand for Woo.

The group is involved in highly diversified research and is working on a number of

projects. They include: (1) multi-electron atom transfer processes; (2) novel coordination chemistry of transition metals, including multiple bonds between transition metals and silicon; (3) preparing linear arrays of transitional metals, fabricating new materials for non-linear optics, materials with magnetic properties and highly unusual conductivity properties; (4) use of inorganic coordination complexes as a means of tuning material for non-linear optics; and (5) new coordination chemistry of low-valent titanium porphyrins.

These research areas have great potential for new applications in various fields ranging from superconductivity to electronics. For instance, linear arrays of transition metals and one-directional conductors could open new vistas in electronics, while non-linear optics could help make better high-speed optical computers. □

Applied Sciences Complex Dedicated

August 15 marked the dedication of the Applied Sciences Complex (ASC). Several hundred people attended the festive occasion that included a picnic lunch and live music flowing from a temporary gazebo.

Visitors toured the ultra-modern buildings and science displays that were erected in tents in front of the complex. Ames Laboratory's display included rare-earth oxides and pure metals, lasers, metal

crystals from the Materials Preparation Center, and educational information.

The ASC houses three key technology development centers—the Center for Advanced Technology Development, the Center for Nondestructive Evaluation and the Microelectronics Research Center.

Robert Mosbacher, U.S. secretary of commerce, delivered the dedication address and said commercialization of high-tech R&D will help the nation become more

competitive in the world market. Praising the cooperative research efforts of Ames Laboratory, ISU and IPRT, Mosbacher said that science and technology were basic to progress and economic development.

Some of the other speakers at the ceremony included, Iowa Governor Terry Branstad; congressman Neal Smith; ISU provost Milton Glick; David Kauf, broad president, Edge Technologies; and IPRT director, Michael Crow, who was master of ceremonies. □



Top: The HyperCard program on lasers was a big hit with visitors to the Ames Laboratory exhibit which was located in front of the Applied Science Center (ASC). Bottom: The exhibits set up for the ASC dedication were housed in tents located between the building complex and the food serving area.



Top left: Anne Coffman and Rose Bielefeldt of Metallurgy and Ceramics learn more about their program area while viewing the Materials Preparation Center exhibit at the ASC dedication.

Middle left: R. Bruce Thompson, John Erickson and Harold Skank discuss the relative merits of brats and chicken while waiting their turn to be served.

Lower left: ISU Provost Milton Glick related the importance of the Ames Laboratory to the success of the Centers that make up the Institute for Physical Research and Technology.

Upper right: The educational role of Ames Laboratory and laser science were two of the areas featured in the exhibit.

Lower right: Looking like an old fashioned chautauqua, the front lawn "picnic" featured a brass ensemble in a portable gazebo.

During the latter part of September, construction will begin on a new road that will be located approximately 30 meters north of the Metals Development Building. The road will extend from Morrill Road, west to a loading dock on the east side of the Molecular Biology Building. During construction, the north portion of Ames Lab parking will be moved further north.

ISU's solar car, the PRISUM, finished in 17th place among the 32 cars in the 1990 GM Sunrayce USA. The 1600-mile, 11-day race from Florida to Michigan took the PRISUM 109 hours, 8 minutes, 29 seconds to complete.

Work has already begun on PRISUM 2 in anticipation of the 1991 Sunrayce in Hawaii next summer. The Ames Laboratory shops will continue to support this effort on a voluntary basis. Roland Struss, director of operations, will continue to serve as an advisor on the project.

Because of circumstances beyond the control of facilities services, there will be a delay in restoring the Wilhelm Hall elevator to service. Material and equipment will continue to be transported each Monday, Wednesday and Friday morning. Your patience in this matter is very much appreciated.



On August 5, a vigorous Harley Wilhelm celebrated his 90th birthday. With his endless energy, he often walks the mile from his home to Wilhelm Hall, where he still has an office. He bowls in the ISU Faculty Bowling League, participates in an exercise class, does his own gardening, mows his own lawn, is active in Rotary, and plays his accordion in neighboring community parades.

Beginning the early part of October, the south side of Wilhelm Hall will take on a new look. The replacement of Wilhelm's south side windows is scheduled to begin during the first week in October. Replacement will begin on the west end of the south side of the building and within six weeks (weather permitting) all the windows on the south as well as the east and west ends will be replaced.

**DO NOT DRAG EQUIPMENT
ON HALL FLOORS
PLEASE USE A CART!**

COMPUTER SECURITY

We continue our discussion on the proper care of diskettes taken from HP PROFESSIONAL with permission of Professional Press Inc., 101 Witmer Rd., Horsham, PA 19477, November 1989.

Never place fingers on the diskette through any openings in the jacket (these slots expose the magnetic surface). Your hands contain an oil that is a disaster to a diskette.

Don't smoke around the diskettes. Smoke, ashes, and even the presence of ashtrays can cause havoc that won't be found until you try to read a file.

No liquids or sprays should be allowed around the computer. Any diskette that comes in contact with either should be discarded. When

the liquid dries, a residue still remains; even water leaves rings. Don't save it - it's not worth the money it will cost in unneeded repair bills later. If you must use an antistatic spray, remove your diskettes first.

No fumes such as nail polish, glues and cleaners should be used around the diskettes.

Keep the diskettes away from any type of magnetic fields. (When diskettes are purposely erased, a magnet is waved over them). A magnetic field can be found around magnetic objects (magnets, of course, and some screwdrivers), objects that contain hidden magnets (such as your telephone, radio, car ignition switch), objects that can become magnetized over time (paper clips, keys, metal

filing cabinets, anything metal), or objects that can produce electromagnetic interference (fluorescent lighting, dimmer switches, most carpeting or any appliance that contains an electric motor, such as a vacuum cleaner). Never leave diskettes lying on top of the video monitor.

Don't wear rubber-soled shoes or hold or touch any diskettes while walking around the carpet on a warm or dry day. And, believe it or not, don't point to a diskette on a warm or dry day; a spark can "zap" your disk if you point your finger at it (you need not be touching the disk).

Antistatic mats and sprays can help cut down the static electricity in the room, but the above precautions should still

be taken. Storing the diskettes in a plastic container can help keep them away from magnetic fields, however, the plastic will not protect them from objects already highly magnetized.

Any interruption in the power source while diskettes are in the drives can erase the disks. Don't use your computer in storms or other weather that plays havoc with the power lines. If the power goes down unexpectedly, remove your disks from the drives. When the lights go on again, the surge of power could wipe out your data. Also, don't test your building's fuses or circuit breakers when the computer is on.

Continued next month.

NEW EMPLOYEES

Pane Baccam,
Custodian I
(Lynn Runge)
Ralph Barton,
Custodian Helper
(Lynn Runge)
Timothy Buelow,
Research Helper
(James Coronas)
Anna Crabtree,
Graduate Assistant
(Pat Thiel)
Lars Ewell,
Graduate Assistant
(Joseph Shinar)
Rodrigo Formas,
Research Helper
(Joseph Shinar)
Theodore Heise,
Graduate Assistant
(Ed Yeung)
Anne Howard,
Typist Clerk
(Lowell Mathison)

Mark Jensen,
Graduate Assistant
(Pat Thiel)
LaDon Jones,
Associate
(James Coronas)
Thomas Lee,
Graduate Assistant
(Ed Yeung)
Manuel Lozano,
Graduate Assistant
(Joseph Shinar)
Glenn Marsch,
Associate
(Gerald Small)
Chris McGowan,
Visiting Scientist
(Richard Markuszewski)
Bishwajeet Sharma,
Graduate Assistant
(James Coronas)
Katsuaki Shimazu,
Associate
(Marc Porter)

Masayasu Sugisaki,
Associate
(David Peterson)
Andrzej Wroblewski,
Visiting Scientist
(John Verkade)

Shiyuan Zhong,
Graduate Assistant
(James Coronas)

Spedding Lecture in Physics

The 1990 Spedding Lecture in Physics was given on August 9 by Maurice Goldman of France. Goldman, one of the world's authorities on nuclear spin dynamics, spoke on "Nuclear Magnetic Ordering in High Fields". Author of many books, he is from the Department de Physique at Centre d'etudes Nuclaire, Saclay, France.

The lecture was held in honor of the late Frank Spedding, founder of the Ames Laboratory and its first director, from 1947-68. Bernard Gerstein, senior chemist, welcomed the speaker and paid tribute to Spedding for his dedication to work and his concern for staff and students. □

Fritz Gets Sixth Award

James Fritz, Ames Laboratory senior chemist and professor of chemistry at Iowa State University, has been selected as the winner of the Dal Nogare Award for 1991. This is the sixth award he has won since 1976.

The Chromatography Forum of Delaware Valley will give the award to Fritz at the Pittsburgh Conference next year. He is being honored for his contributions to the fundamental understanding of

the chromatographic process.

Fritz is slated to make a presentation on "New Chromatographic Methods for the Determination of Water" at the Conference. He and some of his students have been doing research in this area for approximately three years. They have developed a novel detection method for water that is based on the shift in chemical equilibrium. It is possible to determine water in as little as 20 seconds using a liquid chromatographic method.



James Fritz

In addition, a new method for gas chromatographic determination of water has been invented by Fritz and one his graduate students, Jian Chen. He has also done extensive work in ion chromatography, a process almost indispensable for most analytical labs.

A teacher and a popular figure among students, Fritz was recognized by ISU as a

Distinguished Professor earlier this year. "Make science simple and easy for students to understand," he says, "and make it technically correct. Science teaching involves sharing the excitement of science and research with the students and having a greater rapport with them. Science teaching is very important for any country. This is particularly true for the United States where there is a growing concern for science education at the undergraduate, secondary and elementary levels."

The current year is a milestone in Fritz's teaching career of 42 years. In addition to being recognized as a teacher and researcher for two years in a row, his 50th Ph.D. student is graduating this summer. □

Graduate Assistant Honored

Leland Scott Swanson, Ames Laboratory graduate assistant, was awarded the Graduate Student Award of the Materials Research Society (MRS) during the Fall 1989 meeting of the society.

The award was presented to Swanson for his outstanding graduate work on the photoluminescence and ODMR of pristine and photodegraded poly (3-hexylthiophene) films and solutions.

Swanson, who will graduate in May, 1991, has been doing research under the guidance of Joseph Shinar. "Our research in polymers is likely to open new avenues. Right now the technology is available to make rechargeable battery cells. However, down the road I can see exciting applications in aerospace, automotive, home building industries and consumer use."



Leland Scott Swanson

Interestingly, plastic batteries are much cheaper. Unlike the conventional nickel-cadmium types they do not pose toxicity and pollution hazards. However, for purely economic reasons of operating existing plants, nickel-cadmium batteries will continue to be made. □

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