Newsletter for the Employees of the Ames Laboratory • Volume 2 Number 7• July 1991

AMES LAB INSIDER

Receiving an $800,000 slice of a $5 million research pie, Ames Lab secured the third largest share of funds in a new ten-lab alliance directed at materials synthesis and processing.

Ames Lab Brings Home $800,000 Slice of Research Pie

Eight new research projects directed at materials synthesis and processing began in June at Ames Lab. Funded by $800,000 in federal money, plans moved from proposal to reality when Ames Lab competed for and won a generous piece of a $5 million research pie.

In February, Ames Lab was vying with nine other DOE laboratories for $5 million in federal money to establish a materials synthesis and processing center. Faced with the dilemma of selecting one laboratory and losing the expertise of the other nine, DOE decided to divide the $5 million fund among the competing laboratories, drawing upon the unique research capabilities of each.

"There were 10 diverse proposals with a lot of good ideas in them regarding specific research topics and how to run the center," notes Bruce Thompson, Ames Lab associate director for science and technology. "DOE wanted to combine the best of all of them."

Ames Lab Director Tom Barton says the funds demonstrate a renewed interest in Washington in materials research, an area where U.S. leadership has declined. "Many U.S. industries are dependent on the nation's willingness to reestablish our competitiveness in materials research."

The materials synthesis and processing program will extend across all 10 contributing DOE labs, from which five labs have been selected to coordinate separate research "themes." Under Thompson's direction as "theme coordinator," Ames Lab will oversee the Emerging Materials and Processes theme to which eight other labs will contribute work.

Some Ames Lab projects in the new materials synthesis and processing program will focus on synthesizing novel materials, delving into the mysteries of new substances with unique properties that may drive future technologies and benefit U.S. industry. Other projects will investigate innovative ways to generate and use existing materials.

One new project supported by the $800,000 will explore ways to develop processing techniques for welding ceramic components, both powders and shaped forms, using a paste created from silicon carbide (SiC) fine powders and a preceramic polymer. This paste can provide a high-strength bond to join previously shaped SiC bodies.

Another project will remarkably advance materials processing techniques to allow synthesis of complex alloys and compounds, particularly those that will be useful in elevated temperature applications, such as highly efficient engines. Researchers involved in this project will create a class of distinctive high-strength crucibles which can be used as containment vessels for processing metals and alloys that melt at temperatures from 1500 to 2300° C.

Additional Ames Lab research topics benefiting from the $800,000 in federal money include:

- synthesis of new classes of chemical compounds that may help the oil industry refine petroleum into gasoline and remove sulfur from crude oil;
- synthesis of advanced polymers for high-speed communications applications;
- development of processing techniques for tailoring fine ceramic microstructures to improve resistance to fracture;
- use of rare-earth materials for magnetic refrigeration systems;
- processing of microcrystalline SiC thin films for photovoltaic applications;
- development of theoretical models to guide processing of advanced materials. ❑

Jacobson Honored for Teaching Excellence

Possessing something many teachers strive for and a select few give the time and dedication to earn, Robert Jacobson, senior chemist and ISU professor of chemistry, knows he has the respect and admiration of his students.

James Espenson, program director for Processes and Techniques and chair of the Chemistry Department, presented Jacobson with the Wilkinson Teaching Award at the Department of Chemistry Spring Awards Seminar held May 9 in Gilman Hall.

Recognized for excellent teaching in the general chemistry program, Jacobson says, "This award is particularly meaningful because it resulted from evaluations given by students in my classes."

"Professor Jacobson is a super-good teacher at all levels, demanding yet fair.

Robert Jacobson

His students value his instruction and the personal interest he shows in them," Espenson comments.

The Wilkinson Teaching Award acknowledging excellence in classroom teaching is made in memory of Professor John A. Wilkinson, a longtime member of the Chemistry Department. The award was established and funded in his name by an alumnus, Frank A. Landee. ❑

Countdown Begins for New Ames Lab Building

With a targeted completion date late in 1993, the new Ames Lab administration building is in the works as plans enter the third month of a 31-month countdown, according to Rollie Struss, associate director for Operations. "The preliminary design is now underway and is estimated to take two months," says Struss. "Once that is done, we have a DOE review scheduled which we can overlap with the start of the construction documents. We hope to complete our second review and go out for bids by the first of the year. Construction will begin as soon as possible in calendar year 1992," he emphasizes.

The new administration building will fill the gap between Gilman Hall and Spedding Hall and extend all the way back to the chem stores area of Gilman. At a project cost of $6 million, the building represents the first new construction funds Ames Lab has received from DOE in 31 years. Although the reactor facility was constructed in '61-'62, that property was returned to the university, leaving Metals Development, built in 1960, as the last DOE-funded construction in the current Ames Lab complex.

Consisting of approximately 40,000 square feet, the new structure will have four floors, ground through third, with a basement for service use and equipment storage. The new administration building will connect with Spedding at each level and with the first floor of Gilman at the northeast corner stairwell.

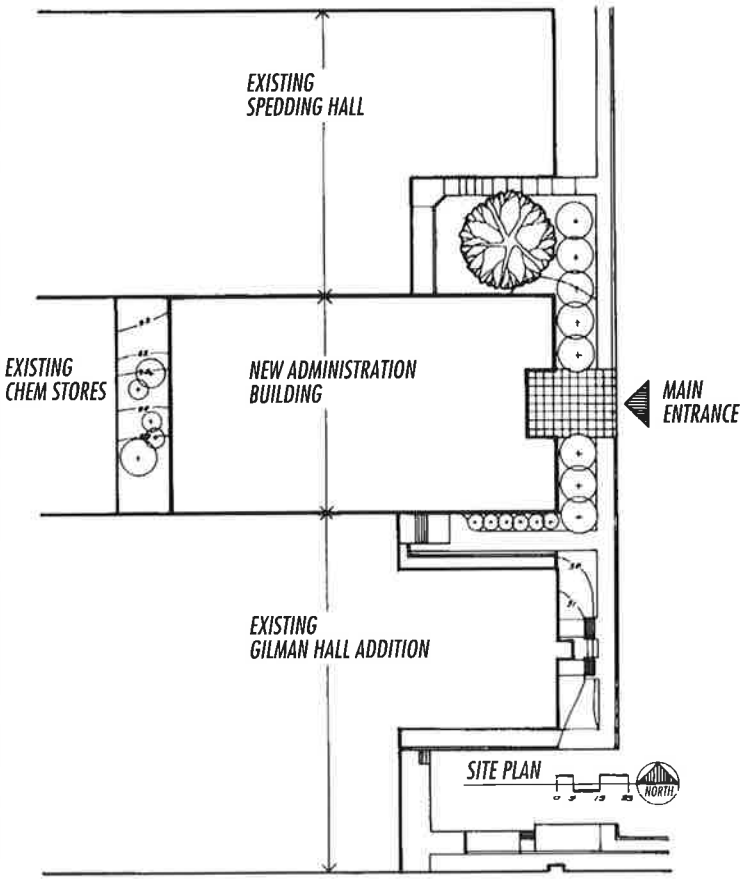
Providing a means to centralize administrative offices and functions, the new structure will result in more efficient use of space for the entire Ames Lab complex and free up much of Spedding Hall for scientific use, its intended purpose. Additionally, the new building will serve as a "front door" to the Lab complex, offering easy public access to administrative offices which are currently housed in difficult to find and inconvenient locations. Departments to be housed in the new facility include: management data systems; occupational medicine; safety, health and plant protection; procurement and property management; accounting; personnel; budget; information; graphics; and director's offices. Also, the laser facilities currently located in the Link are being evaluated to see if they can be moved to the ground floor of the new building.

Architects Rudi/Lee/Dreyer and Associates completed an in-depth investigation of each user group prior to the preliminary design phase of the project. Holding planning sessions with each user group, the architects determined individual group requirements in terms of space and function and evaluated certain "wish list" items. Defining exactly what each user group needs will allow architects to put individual arrangements together so they can be placed on specific floors in the building. "It is very useful to program in this way," notes Struss. "People get what they want and need and there aren't any surprises when they get ready to move in."

The interior design of the new administration building will be a collaborative effort. Architects will work with each user group to determine what is desired for wall finishes, floor finishes, floor coverings, cabinet work and other interior design aspects. "We want to try to get something that is useful to each group and also compatible with the building as a whole," says Struss.

One deliberately planned feature of the new building is a lobby area where some of the historical Ames Lab memorabilia will be exhibited. "This type of historical display helps create an identity for Ames Lab, providing visitors with information about who we are and what we do as they come in the main entrance," comments Struss.

With building plans firmly underway, the countdown continues toward late 1993, when longtime tenants of Spedding Hall, the Computer Garage and the Link will make the move to their new home. "I think people will be pleased," smiles Struss. "The new building should be a good, well-designed administrative space." ❑



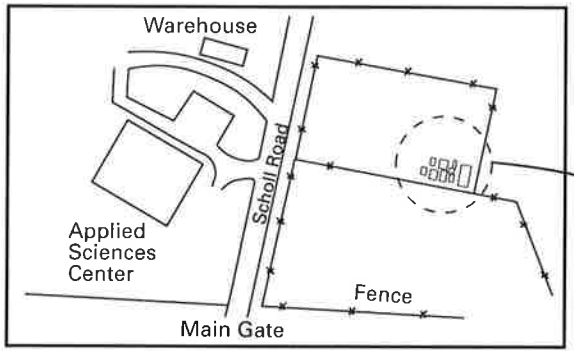
Filling the gap between Spedding and Gilman, the new building will centralize administrative offices and serve as a "front door" to the Ames Lab complex.

Disposal Site Deemed Not a Threat

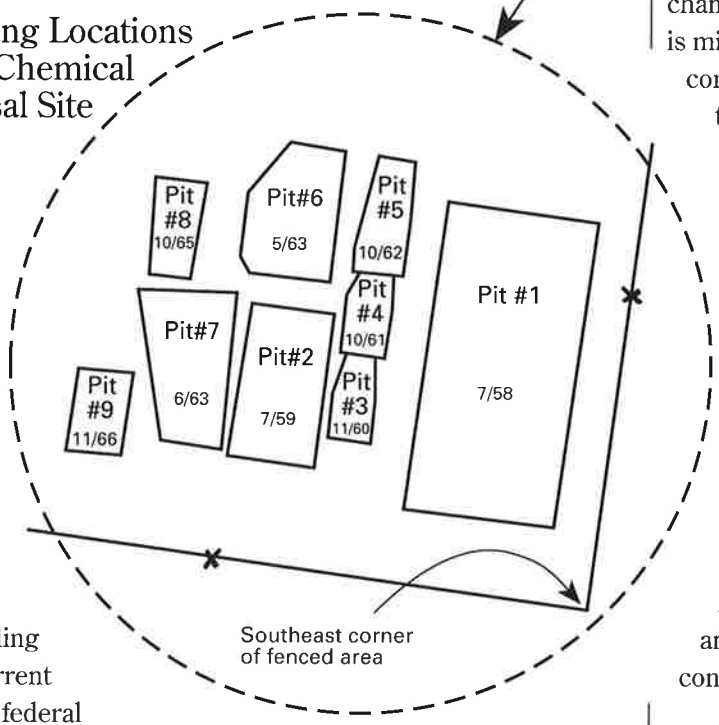
After several months of review, the Iowa Department of Natural Resources (DNR) has identified Ames Lab's old chemical disposal site near the Applied Sciences Center as "not a significant threat to the public health or environment." DNR classified the inactive waste site as a "c" on the Iowa Registry of Hazardous Waste or Hazardous Substance Disposal Sites, indicating the site does not pose a significant health or environmental threat and does not require immediate action.

"We certainly agree with the DNR's assessment but will continue to monitor the site to verify that it is posing no threat to the area," says Rollie Struss, associate director for Operations. While the site is on University property, Ames Lab made the burials at the site and maintains reponsibility for it.

MATERIALS BURIED Between 1958 and 1966, the site was used for nine burials of chemical and metal wastes. The bulk of that waste came from early research at the Lab to develop pilot plant processes that were later used by industry for separating thorium and uranium for nuclear power fuel sources and yttrium for neutron shielding. Also buried were small quantities of reactive or unstable materials from routine chemical laboratory research. All nine burials met all applicable federal regulations at that time. The chemicals, most of which are contained in 5- or 30-gallon enclosed metal containers, were buried in 8-foot clay soil and covered by 4 feet of soil.



Sampling Locations at the Chemical Disposal Site



According to the current accepted federal standards of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) for reporting the accidental release or spill of hazardous materials, none of the chemicals known to be buried at this site are at reportable quantity levels.

The bulk of the materials buried (5,000 lbs) are non-radioactive fused beryllium oxide and yttrium (neither identified as hazardous by CERCLA). Also buried are uranium and thorium slags that contain only small quantities of radioactive isotopes within a mixture of materials and are defined as having very low specific radioactivity. Radioactive uranium and thorium occur naturally within all Iowa soils, also at the level of low specific radioactivity. The general laboratory materials buried include cobalt, cyanides, mercury, potassium and sodium.

EVALUATION "On-going monitoring of this site since 1988 shows no evidence of migration of any of the buried chemicals and metals into the surrounding soils, ground water or nearby creek water, nor any evidence of adverse affects to vegetation in the area," says Lowell Mathison, program manager for Safety, Health, and Plant Protection. Monitoring has included evaluation of surface soil, soil sample corings underneath burial pits, soil sample corings at various points within the site area, ground water samples from test wells and water samples from a nearby creek. "None of these evaluations has shown any evidence of materials leaching from the burials," Mathison adds, "and analysis will continue so that immediate actions can be taken if the situation should change." The risk of leaching is minimized by the high clay composition of the soil and the unsaturated zone (from 9 to 30 feet) between the bottom of the pits and the ground water level.

In the long run we would like to relocate the buried materials to another federally approved disposal site so we can minimize the long-term costs of continual monitoring and alleviate any potential for future concern. ❑

Edelson Recognized for Volunteer Efforts

Offering a little help to his friends brought some unexpected recognition to Martin Edelson, program director for Safeguards and Security, when he was selected by the Department of Human Services (DHS) to receive an award for his outstanding volunteer services to the state of Iowa.

Edelson received his award at the Governor's Annual Volunteer Recognition Ceremony on May 10 at Camp Dodge in Johnston, Iowa. "I don't have a clue as to why they selected me," says Edelson. "The award is nice, but I'd do the volunteer work anyway. Everyone has a responsibility to their community; assuming that responsibility is part of acknowledging how lucky we all are."

"I heard nothing but good things about Dr. Edelson from the social workers and clients he worked with," states Jennifer Hatten, former volunteer coordinator for the Story County DHS, commenting on why Edelson was selected. "He was willing to take on some pretty tough assignments and is what we call a new-age volunteer, a professional person who not only manages an active career, but also finds time to help others."

This was the ninth year for the Governor's Volunteer Awards. Given in recognition of the time, commitment and service that over 80,000 volunteers provide to state agencies, certificates of appreciation were awarded to 1,750 volunteers in twelve ceremonies held throughout the state. "Considering the size and scope of the many state agencies involved, nominations for the Governor's Volunteer Award are very selective," explains Julie Leo, volunteer director for the district VI office of the Iowa DHS.

Edelson says he got into volunteer work by checking off the box that asked for interested volunteers on a United Way pledge card. When contacted by volunteer coordinators for the Department of Human Services, he was offered a number of choices. His particular skill is providing financial planning and form-processing services to clients (Edelson calls them friends) who need this type of organizational assistance.

Edelson's first volunteer assignment involved working with an individual who suffered a football injury in high school that resulted in partial paralysis and brain damage. "He was very gifted artistically and attended Iowa State," explains Edelson. "Because of damage to the area of his brain that permits concentrated attention to detail, he was unable to complete the myriad of forms required each month for his social security benefits."

Edelson is currently working with someone who requires assistance with budgeting and financial planning. His volunteer work for the DHS takes about one hour a week; however, Edelson donates his time to community organizations as well, working for the Ames Jewish Congregation and the Ames Interfaith Council and serving on the planning committee for the Ames Martin Luther King Day celebration.

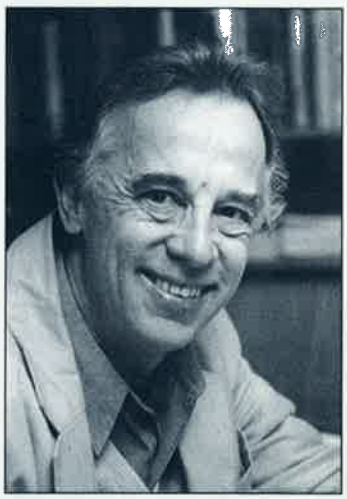
Program Director Martin Edelson (right) accepts an award for outstanding volunteer service from Governor Branstad.

Edelson believes volunteer work is one way people can fulfill their responsibility to the community around them. "You get a feeling that you're doing something useful and that people appreciate it," smiles Edelson. "You meet some very nice and very committed individuals. There are some really wonderful people in the community."

On the lighter side and with typical good nature, Edelson mentions that he will meet a new challenge in September. "I'll be working with a group of people this time, helping them work through their handicaps— the Ames Lab bowling team!" ❑

Small Elected Fellow

Gerald Small, senior chemist, was elected Fellow of the American Physical Society. According to his Fellowship Certificate, he is being honored for "research which established that nonphotochemical hole burning is a versatile laser based probe of disorder and tunneling in amorphous solids and the electronic structure and dynamics of photosynthetic units." His name and citation, along with those of others elected to Fellowship were published in the February *Bulletin of the American Physical Society.*



Gerald Small

Upon receiving this award Small remarked, "I'm very pleased to have been nominated and elected as a Fellow by my colleagues at institutions throughout the U.S." ❑

BULLETIN BOARD

HELICOPTER FLY-BY OVER AMES LAB

A routine aerial radiological survey will be conducted over the Ames Laboratory between July 15 and 25. The helicopter fly-bys will be approximately 300 feet above ground and will take about four days. The survey is done by flying a specially equipped helicopter in a regular pattern over the area of interest at a constant speed and altitude. On-site data processing and survey mapping will be accomplished using a mobile computer laboratory that will be located at the Ames Municipal Airport. The purpose of the survey is to establish a baseline of present radiological conditions. Part of a historic effort to document conditions at DOE facilities, the fly-by at Ames Lab is one of over 300 conducted by DOE.

FROM THE DIRECTOR'S OFFICE...

Recently an Ames Lab employee represented himself at a Federal function as a "DOE employee." This seemingly innocuous event was brought to the Director's attention only after an investigation by the DOE Inspector General (requested by the Department of Commerce), followed by a decision of an Assistant U.S. Attorney not to prosecute the case. Not so innocuous at all.

Everyone in the Ames Lab must realize that **we are employees of Iowa State University and not of DOE**. To represent ourselves as DOE employees could possibly violate Title 18, United States Code, Section 912, False Personation.

The rainy weather has delayed the Spedding Hall roofing project. The project is back on schedule and should be completed by the end of July.

Ames Lab T-shirts can be ordered in the Office of Information. For ordering details or a look at this year's new design and neon colors, come to 201 Spedding. Deadline for ordering is July 8.

A Leco metallographic demonstration laboratory will be at Ames Lab on July 11 from 9 a.m. to 4 p.m. The mobile laboratory will be parked north of Metals Development and will feature microscopes and polishing equipment. Anyone interested in metallographic work is invited to the demonstrations.

Volunteers are still needed to work in Ames Lab's booth at the Iowa State Fair, August 14-25. Two people are needed per shift during weekdays and three per shift during weekends. The first shift is 9 a.m. to 3 p.m.; the second is 3 p.m. to 9 p.m. You can sign up to work individually or with a friend. Volunteers will be given a free T-shirt and admission ticket. Please call Saren Johnston at 4-3474 to volunteer your time for this important Laboratory effort.

Laboratory/Industry Cooperative Agreements Mutually Beneficial

Ames Lab's modified contract now makes it possible for the Lab to enter into Cooperative Research and Development Agreements (CRADAs) with private companies.

"CRADAs have been possible for government-owned, government-operated laboratories since 1986 but were not possible for contractor-operated laboratories until Congress passed the National Competitiveness Technology Transfer Act of 1989," says Dan Williams, Ames Lab associate director for Planning and Technology Application and the Lab's contact person for arranging CRADAs.

These industry-laboratory relationships are mutually beneficial, combining industry's expertise in commercialization with government's expertise in research and state-of-the-art techniques and facilities. "Part of a national effort to speed technology transfer from federal laboratories to the private sector and thereby enhance the U.S. industrial competitiveness, CRADAs are designed to leverage the government's research investment and create a larger payoff for the national economy," adds Williams.

Advantages of CRADAs to individual scientists and the Laboratory include: 1) future potential research dollars; 2) royalties from inventions; 3) positive impact on the economy; and 4) fulfilling a DOE mission. DOE's mission has expanded to include technology transfer, and CRADAs are a mechanism of accomplishing this mission.

Under terms of the law, DOE operations offices have the authority to approve CRADAs, speeding up an otherwise time-consuming process. The Chicago Operations Office (CH) recently approved two CRADAs involving Argonne and SERI. Charles Pietri, science administrator of CH says, "The approval process for both of these CRADAs took only a matter of weeks. With CRADAs, we don't go through a lot of bureaucratic procedures. When there's a strong possibility of an industry-laboratory cooperation, a lot of discussion takes place first to look at the mutual benefits. An understanding is usually reached before we enter into formal negotiations and formalize a CRADA, and this makes the paper work go more smoothly."

CRADAs differ from contracts, grants and other kinds of cooperative agreements because they do not require many of the same legal conditions, such as federal acquisition regulations.

Under the terms of a CRADA, the Lab may contribute facilities, property and personnel to the cooperative effort, and it is also permitted to use DOE funds (if available) to pay costs associated with these contributions. It cannot provide funds to a participant, thus preventing CRADAs from being used as sole-source procurement or for grants.

The Laboratory's partner, (or partners), in the private sector may provide funds to the Lab, along with personnel, services, facilities, equipment or other resources needed to carry out the proposed work. The private sector partner benefits from opportunities to license Laboratory inventions, protection of related technical data for up to five years and minimized paperwork.

To negotiate a CRADA, Ames Lab must first submit a joint work statement (JWS) outlining the purpose, scope and responsibilities to the Chicago Operations Office. CH must review the submission within 90 days and once the JWS is approved, the Lab can negotiate a CRADA and submit it to CH for approval. CH has 30 days to either approve the agreement or report to Congress on its failure to respond to the Laboratory.

As of June 1, DOE Operations Offices had approved at least six CRADAs, with as many as 60 prospective agreements in the works. A CRADA may be initiated by either a Laboratory researcher or by a private sector partner or partners. The specific how-to's for preparing a CRADA are summarized in an information packet prepared by the Ames Lab Planning and Technology Application Office and can be obtained by calling 4-2635. ❑

Chemical Sciences Program Review

Ames Lab's annual Chemical Sciences Program Review was held May 20-21. Seated are program managers, James Espenson (left) and Andrew DePristo. The DOE scientific representatives and review team consisted of standing left to right: Gary Maciel, Stephen Butter, Bill Parson, Allen Laufer, William Millman, Leon Stock, J. Michael Ramsey, and John Tully.

Hailstones and Golfing Groans

Hail, hail the gang's all here,
And now that it's over they can look back with cheer
At the Les Reed Open where the sky was so blue,
And before it was over, the golfers were too!

For the skies opened up; icy golf balls came down,
Leaving more than one player in a grump with a frown.
Not only were they stopped in the midst of their play
By the steel-gray clouds that threatened the day,
But their cars took a beating from the plummeting hailstones.
The golf course resounded with curses and groans!

Looking back on it now, there's no way we can fail,
To delight some of you with this INSIDER tale.

"I have "hailaphobia," says Lanny Lincoln, senior research technician, referring to his unforgettable experience during the 23rd Les Reed Open golf tournament. Although hail damaged all vehicles of those attending, Lincoln's pickup sustained a whopping $3,000 worth! "The skies opened up at the Les Reed Open," he sighs. "Some of us thought about continuing to play, but we couldn't distinguish the golf balls from the hailstones!"

Held May 17 at the Don Williams course northwest of Boone, the golf tournament boasted some amusing moments amidst the devastation. Tom Wessels, associate scientist, was wearing shorts and "borrowed" Marvin Thompson's umbrella to protect his bare legs from the hail. "Marv kept hollering for me to hold the umbrella over his head. Since the hail was coming in at an angle, my legs were in greater danger than his head," Wessels insists.

According to Les Reed, senior research technician, the annual tournament began twenty-three years ago as a group picnic outing and grew into a golfing event. "I'm planning a twenty-fifth year reunion extravaganza in 1993," grins Reed. "Many now retired Ames Lab employees who played in the yearly tournament will be invited back for the get-together."

In spite of the hail, players remained hardy and were able to finish at least one nine-hole round in the tournament. Howard Klemmer, mechanic, won first place with a net score of 35. Taking second place was Ron Berrett, electrician, with a net score of 38. Traveling trophies were awarded to both winners.

Undaunted by bad weather, bad luck or bad scores, the golfers stuck around for sandwiches in the park at the day's end. ❑

Howard Klemmer (left) and Ron Berrett, the first and second place winners of the Les Reed Open, respectively, display one of the traveling trophy awards.

AMES LAB INSIDER

Volume 2/Number 7/July 1991

Ames Lab Insider is published 12 times a year for the employees of the Ames Laboratory by the Office of 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 consortium of fundamental and applied research centers.

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P-208-9