

## AT&T, SEMATECH Agreements Boost Sandia's CRADA Total

Sandia's Albuquerque and Livermore sites have drawn the largest share of work in a package of four new research agreements worth a total of \$62 million. The cooperative R&D agreements (CRADAs), announced last month in San Francisco by Energy Secretary James Watkins, include two projects with AT&T.

President Al Narath joined Secretary Watkins in signing the CRADAs, the largest number so far agreed to in a single group. The new agreements bring to 37 the number of CRADAs Sandia has signed with US companies.

"This package was satisfying for Sandia because it includes the first projects involving our parent organization, AT&T," says Al.

"The purpose of CRADAs is to bring the expertise developed at the national laboratories to bear on economic issues facing our country today and in the future," he says, "and the two AT&T CRADAs and the one with SEMATECH do just that."

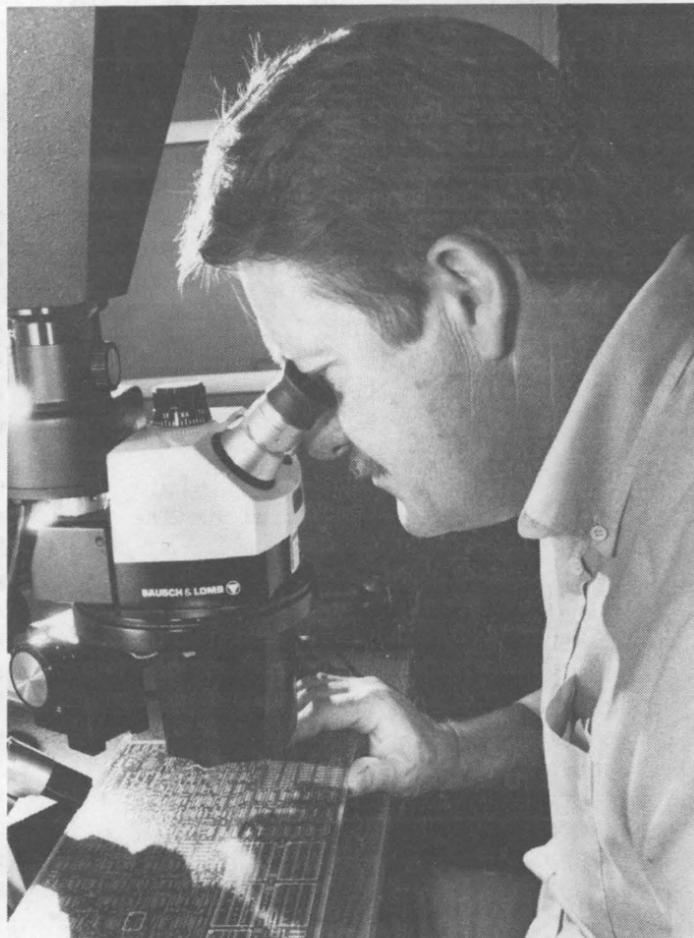
SEMATECH is a consortium of US companies formed to recover world leadership in semiconductor manufacturing.

### Three Totaling \$55 Million

The three CRADAs involving Sandia are

- A \$34.7 million five-year project with the National Center for Manufacturing Sciences (NCMS) to develop generic printed wiring board technologies for the next generation of electronic components. It teams Sandia and the National Institute of Standards and Technology with four NCMS members — AT&T, Texas Instruments, Digital Equipment Corp., and Hamilton Standard Interconnect.

- A \$14.3 million three-year project teaming Sandia, Livermore with AT&T to develop new soft X-ray projection lithography (SXPL) patterning technologies for the production of high-



CLOSER LOOK — Fred Yost, a Team Leader in Solder Science and Technology Dept. 1831, peers through a microscope at the intricate patterns of a printed wiring board. Sandia has signed a CRADA with AT&T and three other companies to develop PWB technologies for the next generation of electronic components.

density integrated circuits (ICs) with feature sizes below 0.2 micron.

- A \$6 million collaboration teaming Sandia and SEMATECH to develop technologies and

equipment for contamination-free manufacture of integrated circuits. A major goal is the creation of a Contamination-Free Manufacturing Research Center at Sandia, Albuquerque. The initial nine-month agreement will be extended for several years and is expected to reach annual funding levels of \$20 million.

Funding to support CRADAs is provided by the parties involved in each one, as agreed during negotiations. Dollar amounts can include the value of in-kind contributions such as actual work and material to be used in the research, as well as cash.

The fourth CRADA in the package is a \$7.1 million three-year project teaming Lawrence Livermore National Laboratory with six US companies to develop methods to reduce dramatically the amount of time and expense required to retrieve massive amounts of data needed for high-performance computing applications.

"This is another major milestone in our program to bring the research capabilities of the

**"This package . . . includes the first projects involving our parent organization, AT&T."**

DOE labs into full support of long-term US economic growth," says Watkins. "Successful technology transfer and commercialization will lead to the creation of jobs, more environmentally conscious manufacturing technologies, and improvement in the quality of life here and abroad."

Barry Schrader of Personnel and Employee Resources Dept. 8522 says the AT&T lithography CRADA is the largest of Sandia, Livermore's three tech transfer agreements.

Although it targets production of ICs with  
*(Continued on Page Four)*

## SCIADS Get National Notice in Education Week

*Editor's Note: This is a condensed version of a story originally published in the May 13 issue of Education Week, which covers education issues nationwide. The article, by Julie A. Miller, has some nice things to say about Sandia's Science Advisors (SCIADS) program in New Mexico. We thought Sandians would be interested in reading the article. Thanks to Education Week for allowing us to reprint the story. Bracketed information within the story, including Sandians' organization numbers, has been added by the LAB NEWS.*

During most of his working hours, Eugene Lujan [1237] uses computers to design weaponry and other scientific equipment. But one day in late April, he is standing in a classroom at Isleta Pueblo and poking wooden skewers into balloons, to the delight of a roomful of first graders.

"I hope it busts," says Jerry Nutumya, clapping his hands.

"I hope it doesn't," counters Athena Herrera, covering her ears.

She gets her wish. Mr. Lujan says it worked because he smeared Vaseline on the skewers to act as a sealant and inserted the skewers into the poles of the balloon, where the rubber was stretched the least.

He is teaching scientific concepts. But he is  
*(Continued on Page Five)*

**More DMTSs —  
See Page Six**



# LAB NEWS

VOL. 44, NO. 12 SANDIA NATIONAL LABORATORIES JUNE 12, 1992

### Time, Volume Add to Challenge

## Sandia's Design Expertise Helps US Dismantle and Dispose of Weapons

Like a cue ball with reverse spin that returns to its starting point after it knocks another ball into a pocket, the nuclear weapons Sandians designed and refined to face-off against the Soviet Union during the long Cold War have done their job and are coming home.

As they are removed from bomb bays, silos, and submarines following President Bush's decision to stand down more of the US nuclear arsenal — and sooner — than agreed to by treaty with the

**"We're calling on Sandia's long-time experience . . . to find quick solutions to short-term problems."**

former Soviet Union, the Labs' new challenge is finding ways to dismantle them and safely dispose of or store their components.

Paul Longmire, Dismantlement Program Manager 5407, says the project is not as simple as a cartoon he includes in his presentation at meetings on dismantlement. The cartoon shows recycling containers outside the White House, labeled for glass, aluminum, plastic, newspapers — and warheads.

"It always gets a chuckle and gives me a springboard for getting into the subject," he says.

And the subject is far more complicated than it might seem, in spite of the intense planning and careful fabrication that always has been part of the nuclear weapons program.

### Environmental Issues

"The problem," Paul says, "is that some of these parts are 20 or 30 years old, and many things have changed since they were built. We are much more concerned with environmental issues today, for example, than we were then, and weapons components contain material that must be disposed of in compliance with environmental laws and regulations."

Simple examples, he says, are the lead in solder, copper wiring, and mercury in some switches. All are substances whose disposal is prescribed by environmental regulations.

Sampling components is sometimes difficult, he says, because they might be enclosed in a sealed container and the only way to determine what materials were used in their fabrication is to  
*(Continued on Page Four)*

# This & That

A Better Connection with AT&T? - The letter to Sandians from AT&T Chairman Robert Allen (at right) is encouraging. Although AT&T will not manage Sandia after September 1993, Allen clearly wants the R&D ties between us to continue and possibly expand.

Many of us were disappointed when we learned last month that AT&T had chosen not to seek to renew its Sandia management contract with DOE. We have long taken pride in our relationship with our prestigious parent, and we hoped it would continue. But changing times and changing priorities at both AT&T and DOE just didn't make that feasible.

So, as we begin to enter a new era in our relationship with AT&T, Bob Allen's words are welcome news and can perhaps serve as a springboard for a different - maybe even better - connection between the Labs and AT&T. That connection is already taking shape, in fact. Two new cooperative research and development agreements (CRADAs) involving Sandia and AT&T (along with several other CRADAs) were announced late last month by DOE Secretary Watkins, and these two agreements alone are worth \$49 million. Now that's what I call a good start on a new relationship! (See page one for the story.)

\* \* \*

SCIADS Is Not a Disease - In fact, Sandia's SCIADS - Science Advisors - program is trying to help "cure" some science and math "ailments" in our schools. A complimentary story about our New Mexico SCIADS program was published recently in *Education Week*, which covers education issues nationwide. It's OK to brag about your accomplishments every once in a while, but it's much better when others brag about you. The *Education Week* folks were kind enough to allow us to reprint the article. I think you'll enjoy reading it; see page one. By the way, four Sandians at the Tonopah Test Range serve as Science Advisors in Nevada, and many Sandia, Livermore folks are active in the Science/Math Carnival program there, with similar activities and objectives.

\* \* \*

Philosophy from Famous "Physician" - "Sometimes the heaviest moments require the lightest touch." Those words of wisdom from the young TV "physician" Doogie Howser may be appropriate for today's uncertain, changing times - just what the doctor ordered, you might say.

\* \* \*

Any Volunteers? - Some of the program names that we use around the Labs can conjure up some strange images if you think about them a bit. How about the "Voluntary Group Accident Insurance Program"? Managing Editor Charles Shirley says his former office mate Jerry Crowder (9613) said he was thinking about signing up for the program, but then decided that he didn't plan to volunteer for a group accident.

\* \* \*

Fresh Faces - Isn't summer great, with these fresh-faced, eager students around the Labs? We've got one of our own at the LAB NEWS: Dawn Thatcher, a technical communications major at New Mexico Tech, who was also with us last summer. Welcome to her and all Sandia summer helpers.

\* \* \*

But Should We Really Go? - Headline and the first few words of text from an item in another weapons-complex newspaper: "Managers must attend June meeting - All managers are required to attend a mandatory meeting . . ."

●LP

## AT&T Chairman Writes Sandians

### Robert Allen Wants AT&T Interactions with Sandia to Continue

To the People of Sandia:

AT&T and Sandia have enjoyed a successful relationship for 43 years. We have served the nation well during a difficult period in history. I like to think that President Truman, who called upon AT&T to manage Sandia, would have been pleased with his choice. The national interest has indeed been served in an exceptional manner, thanks to the dedication and hard work of you and others before you.

As you know, our management of Sandia will cease in about 16 months. However, I look forward to the continuation of many professional interactions and the birth of new relationships. Both organizations have benefited from the AT&T/Sandia relationship and from the advances in scientific understanding and technology that have grown out of it.

Currently, AT&T and Sandia are collaborating on important R&D projects such as waste minimization in manufacturing, software development, high-speed data networks, microelectronics, fiber optics, and X-ray lithography. I trust these types of exchanges will continue and that new forms of teamwork will emerge.

We at AT&T are enormously proud of our long association with Sandia. I look forward to applauding future Sandia accomplishments that will surely grow out of program initiatives that address national needs and your many cooperative research and development agreements with industry.

As we work together to assure a smooth transition to new management, I have complete confidence that all of you will remain dedicated to Sandia's strategic vision and to further enhancing the security, prosperity, and well-being of the nation.

Sincerely,

Robert E. Allen,  
Chairman of the Board, AT&T

#### Help Us Recognize Sandians

The LAB NEWS wants to recognize Sandia employees and retirees who receive honors and awards. Give us a call at 844-7841, or send a note with a few details to Department 3162. In Livermore, contact Barry Schrader (8522) on 294-2447.

## LAB NEWS

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SECRETARY OF ENERGY James Watkins (seated) shares the experience of being photographed by infrared imaging with a bilingual class at Hawthorne Elementary School in Oakland during a recent visit. Fourteen Sandians presented seven programs for a science carnival at the school. Sandians seen here (standing, left) are Dean Williams (8746) and Marta Leon (8526). During his Bay Area visit, Watkins also took part in a Bay Area Science-Technology Education Collaboration awards luncheon at the Oakland School District and officiated at signing ceremonies for cooperative R&D agreements involving Sandia and other labs (see story on page one). (Photo by Lynda Hadley, 8275)



**Sandia Hosts International Conference****Researchers Discuss Plasma Surface Interactions in Fusion**

On the slate for discussion at a recent international fusion conference hosted by Sandia were progress at Princeton's Tokamak Fusion Test Reactor, information about notable results in controlled nuclear fusion at the Joint European Torus, and ideas for the proposed International Thermonuclear Experimental Reactor.

About 250 researchers who investigate plasma surface interactions in magnetic fusion energy reactors attended the 10th international conference in Monterey, Calif. Plasma surface interactions — which occur when components of a fusion reactor are contacted by the plasma (atomic-level charged particles) composing the fusion "fuel" — have proved to be a key technological issue as experimental fusion reactors become larger and more powerful.

Conference chairman Walter Bauer (8301) says this was truly an international group, with 16 countries participating. Included were 45 from Japan, 40 from Germany, 30 from England, and five from Russia, in addition to 120 participants from the US. The researchers included plasma physicists, surface scientists, materials scientists, and engineers, says Walter, noting that the Sandia fusion program includes people in all those fields.

The opening speaker, introduced by President Al Narath, was William Happer, Director of Energy Research for DOE. The five-day meeting included sessions covering the experimental and theoretical sides of both fundamental

**Plasma surface interactions have proved to be a key technological issue for controlled fusion.**

and applied topics, including plasma properties near surfaces; plasma fueling, recycling, and tritium inventory; plasma contaminants, and their transport and control; modification of the plasma boundary; plasma-facing materials, coatings, and conditioning; surface physics of materials exposed to plasmas; plasma-edge diagnostics; and plasma surface interactions in future fusion devices.

"The feedback I received indicates that the meeting was highly successful, both in terms of the number of people who came from all over the world and in the quality of the papers," says Walter.

**Two Megawatts at JET**

Walter adds that one of the technical highlights was learning the importance of plasma surface interaction in attaining the very positive results reported at the Joint European Torus (JET) in England. "They introduced tritium into JET and made 2 megawatts of fusion energy, largely due to opti-



CONFERRING at the plasma surface interactions fusion conference are (from left) Michiya Shimada of the Japan Atomic Energy Research Institute in Naka, which will host the conference in 1994; Walter Bauer (8301), conference chairman; and Rainer Behrisch of the Max Planck Institute in Garching, Germany.

mized plasma surface interactions."

It was also reported at the conference that the Tokamak Fusion Test Reactor at Princeton has come very close to what is known as "Q=1," meaning that the machine produces as much fusion energy as is put into it — an accomplishment also called "scientific break-even." "This will be a major milestone," Walter says, "and I think there's reason to believe it's attainable in the near future. There's a lot of optimism regarding that." Extensive tritium operations are set to begin there in July 1993.

A panel discussion and many papers dealt with the International Thermonuclear Experimental Reactor, a \$6-8 billion machine being planned by a consortium of several countries—the US, Japan, the European Community, and Russia. The agreement for the engineering design activity phase of this 1-gigawatt (1 billion watts) fusion reactor is due to be signed this month. No site has yet been determined for the project.

**Credit to Sandia Organizers**

The Sandia Local Organizing Committee, headed by Ken Wilson (8347), deserves a tremendous amount of the credit for the success of the conference, says Walter.

Members include Rolanda Bailey, Carla Fugazzi (both 8301), Bob Bastasz, Dean Buchenauer, Rion Causey, Wen Hsu (all 8347), and Monica Gabbard (8715). Stewart Wavell-Smith (8535) designed the conference logo and program artwork.

**News Brief**

David Rosenzweig, Administrative Assistant for California Weapon Development 5300 and Exploratory Systems and Program Development 8100, recently earned the American Compensation Association's Certified Compensation Professional designation. He did this by passing seven comprehensive exams designed to measure knowledge about compensation and benefits theory and practice. The Compensation Professional program of study covers such areas as quantitative analysis, legal compliance, program design and administration, accounting and finance, and strategic planning.

**Congratulations**

To Tina and Jim (1951) Berry, a daughter, Jana Lynn, April 20.

To Kris and Larry (8361) Baxter, a son, Kyle Garth, May 7.

To Manette and Rob (8351) Barlow, a daughter, Julia Anne, May 8.

To Melanie Miller (8100) and Glenn Arace, married in Fremont, May 9.

To Jackie Chen (8351) and Paul Nielan (8741), a son, Zachary John, May 20.

To Martha and Bob (8354) Lucht, a daughter, Kimberly Ann, May 24.



**SANDIA  
LIVERMORE NEWS**



**40-YEAR MILESTONE** — Lorena Schneider (8501) is congratulated by VP John Crawford (8000) on being the first woman at Sandia, Livermore to reach 40 years of Labs service. Lorena transferred from Albuquerque to Livermore in 1956, the first year of the Livermore site's operation, to be secretary for retired VP Jack Howard (then a director). Lorena is currently Sandia, Livermore's Audit Coordinator. Also seen here at Lorena's 40th-anniversary celebration are Janet Brooks (8532, left) and Grace Petines (8523).



*(Continued from Page One)*

## New CRADAs

feature sizes below 0.2 micron, SXPL researchers at Sandia and AT&T believe that technology "holds the promise of 0.1 micron line widths," according to a joint work statement they prepared.

As a point of reference, a micron is a millionth of a meter. A human red blood cell is about 7.5 microns in diameter, and an average human hair is about 80 microns in diameter.

A competing technology, proximity X-ray lithography, has attracted the attention of Japanese IC manufacturers and IBM in the United States. The Sandia-AT&T team says the X-ray sources for this method are extremely intense, but exceedingly complex and expensive barriers to their integration into the production line.

The Sandia-AT&T collaboration on SXPL grew out of spontaneous encounters between counterpart researchers at technical society meetings and their conclusion that since they were working on the same technology, but from different directions, informal cooperation might be mutually efficient and beneficial.

"The CRADA will enable us to address these areas and ultimately demonstrate the fabrication of circuits with feature sizes between 0.1 and 0.2 micron," the statement says. "If the program is successful, it will place advanced US chip manufacturing on a very competitive footing vis-à-vis foreign manufacturers."

### Keeping Pace

Meanwhile, Sandia, Albuquerque researchers will be looking for ways to help manufacturers of printed wiring boards (PWBs) keep pace with the developers of the devices mounted on them.

The Labs will transfer existing technology to

NEW WORK FOR LABS — Sandia President Al Narath signs a package of four CRADAs during a recent meeting hosted by DOE Secretary James Watkins (right) in San Francisco. Two of the new agreements involve collaboration between Sandia and AT&T, represented by William Brinkman (left), Executive Director of Research Physics Division for AT&T Bell Laboratories. Brinkman was formerly Sandia VP for Research.

(Photo by Lynda Hadley, 8275)



the four NCMS participants and continue further research in the areas of materials, soldering technology, and chemical processing.

"Printed wiring board technology has been challenged to keep pace with electronic device technology, and the fundamental limits of existing PWB manufacturing technologies are increasingly apparent," says Jim Jellison of Liquid Metal Processing Dept. 1833. "To fully exploit the increased operating speeds and number of interconnections becoming available, improved PWB manufacturing technologies must be developed," he says.

Sandia's specific contributions to this effort will be in research on processes for lamination, resin development and reinforcement, board defect prevention and analysis, copper plating, solder wetting dynamics, chemistry of solder flux, and development of solderability test methods.

The Labs' collaboration with SEMATECH will aim at reducing contaminants that limit yield,

a problem that has grown as semiconductor structures and film thicknesses have shrunk. Research will focus on the effects of chemical particulates and electrostatic, thermal, and electromagnetic radiation (including light) contamination on circuit yield and performance.

Both Sandia and SEMATECH officials say the facility to be established at Sandia is expected to attract industry participants from the integrated circuit manufacturing community, equipment and chemical suppliers, and universities.

"All of this work," says Al, "is important. It makes use of Sandia's core technical competencies, applying them to areas of vital economic importance to US industry. Even though we're actively seeking opportunities like these so we can share our skills in reinforcing our country's economy, the selection of Sandia by such industry-leading companies is a compliment in which we can all take great pride." ●HK

*(Continued from Page One)*

## Dismantlement And Disposal

drill into the container to obtain a sample.

"The problem with that, though," he says, "is that you're not sure what you might include or not include in the sample. Do you drill into the container near a corner, or in the middle of a side? And which corner, and which side? Where are these materials you're looking for, precisely, and can they be extracted?"

"Given the number of weapons we're going to be looking at for dismantlement, the number of components in each weapon — the B61, for example, has about 6,000 components — the time constraints we'll face, and a whole array of other issues, this is going to be a big job. It's not going to be as simple as the cartoon implies," he says with a grin.

### Dismantlement Team

Paul is one of five members of DOE's Executive Management Team for Dismantlement. Other members are from DOE headquarters, the DOE Albuquerque Area Office, and Los Alamos and Lawrence Livermore national laboratories.

He says the issues being discussed as the group establishes policies for the ongoing process include storage of components, the quality of dismantlement procedures, transportation of weapons in the dismantlement pipeline, and the evaluation, retention, or reuse of components.

If components are to be reused, for example, care must be taken to ensure that they are not damaged during dismantlement and that they are properly stored to prevent deterioration.

"The bottom line is that we ought to take the time and do it right," Paul says. "The Department of Defense is under pressure to get the weapons out of Europe and off-line, after the President's an-



PIECE-WORK MACHINE — Pat Neiswander of Weapons Waste Management Technology Dept. 6623 looks through photos of examples of the tiny pieces of material left after a weapon component is cryofractured. Pat says those familiar with the forge hammer nicknamed "Cryo Cruncher II" have coined a word for the process in which it smashes components made brittle by a bath in liquid nitrogen — "rubble-izing."

nouncement, and we want to do that in the best interest of safety for the whole world."

Another facet of the process is the Integrated Manufacture/Design Initiative, which Paul describes as a "looking-forward initiative" whose goal is a policy of designing and manufacturing future nuclear weapons to anticipate and make easier their eventual retirement and dismantlement.

The substance of that program, although not yet formalized, is reflected in the dismantlement

quality process, which includes joint participation of the design agency, production agency, and DOE from the time a weapon is handed over by the DoD until it is dismantled and its components are stored, disposed of, or destroyed.

### Robotics Application

Paul says a large number of Sandia organizations are working on weapon dismantlement technologies. Two specific problems they are examining are robotic handling of components and methods for disposing of discarded parts.

Although workers run little risk of radiation exposure from initial dismantlement stages, handling of plutonium or uranium poses greater risk, so robotic devices are being developed for remote disassembly of components and placement of containers of plutonium in storage igloos.

Disposal of unneeded components could take one or more of several paths, including vitrification (entombment in glass), acid digestion, shredding, grinding, and shearing. One method getting a close look, however, is cryofracture, which involves dipping a component into liquid nitrogen, whose extremely low temperature makes the component brittle, then smashing it with a forge hammer, which reduces it to tiny fragments. This not only prevents future military use of the component, but enhances analysts' ability to determine its material composition.

Another problem being examined is that of monitoring stored special nuclear material without unnecessary radiation exposure to workers. One possibility, Paul says, is a fiber-optic monitoring system that would enable workers to read container identification numbers without having to enter storage igloos.

"In all these efforts, we're calling on Sandia's long-time experience with nuclear weapons to find quick solutions to short-term problems and design new procedures to avoid future problems," Paul says. "Hopefully, in the process, we'll also develop technology we can transfer." ●HK

(Continued from Page One)

## SCIADS

also trying to change the children's attitudes toward science and scientists.

Mr. Lujan is a science advisor at the Isleta school, which means he is given one day a week off from his job at Sandia National Laboratories to work there. About 200 of the Albuquerque laboratory's scientists [along with engineers and other technical employees] participate in the program, each assigned to one or more schools.

Currently, 106 Albuquerque public schools participate, along with 42 rural schools, and 29 Bureau of Indian Affairs schools, such as Isleta.

One goal of the program — part of a US Department of Energy education initiative — is to encourage better science instruction. But an equally important mission of the "SCIADS," as they are called at Sandia, is to act as scientific ambassadors, convincing students that science is both exciting and a career they can aspire to.

"I try to emphasize that science is a fun activity, to demythologize it," says John Torczynski [1512], a chemist who is an advisor at Hawthorne Elementary School in Albuquerque. "When a child comes up to you and says, 'I want to be a scientist,' it sends chills up your spine."

"In low-income areas, in particular, the role-model aspect of it is very important," adds Raymond Heath [35], who coordinates the Albuquerque portion of the SCIADS program.

To that end, the program's directors said they try especially hard to recruit advisors such as Mr. Lujan, who is of Native American descent.

"It's a valuable lesson that Larry is a Hispanic," Marie Garcia, the director of instruction for the Belen school district, says of Larry Salgado [6212], a SCIAD who works at two schools there.

"Kids think of someone in a white coat with thick glasses, hunched over a beaker," Ms. Garcia says. "They can identify with Larry."

### Improved Student Attitudes

Educators involved with the program eagerly volunteer evidence of improved student attitudes. At Isleta, for example, the principal, Joseph Green, notes that 25 students entered projects in a science fair for Native American students held in April in Milwaukee.

"The first year I was here, there were zero," he says.

Likewise, when students at Hawthorne Elementary were asked to "illustrate their favorite subject," more than half chose science. Belen's La Merced Elementary School had so many entries that it had to hold two science fairs this year.

"The difference in quality was amazing, too," says Rudy Chavez, the school's principal. "Even the parents could see."

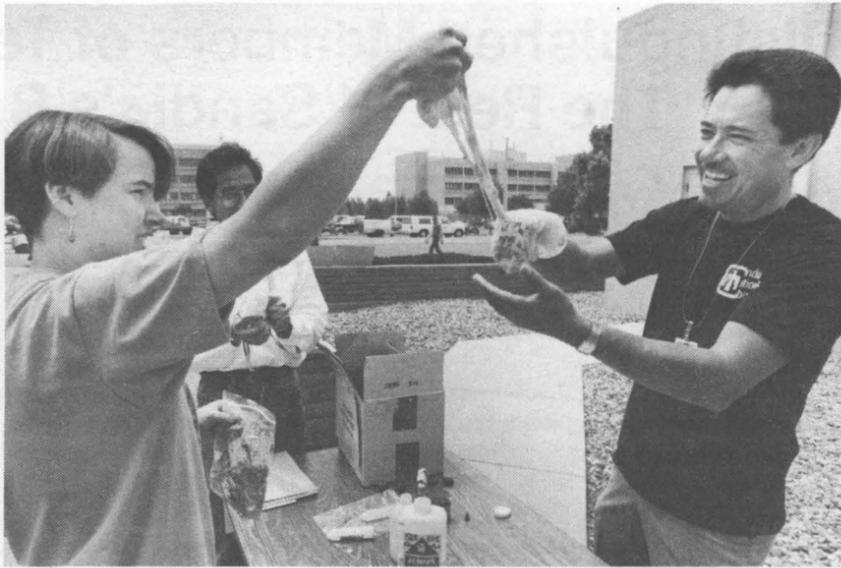
Each SCIAD consults with educators at his or her assigned school to fashion a program that meets the school's needs and curriculum. Some primarily work with teachers on lesson plans, and many work on schoolwide activities like science fairs. But most advisors focus on helping teachers inject more hands-on science into their lessons by preparing in-class experiments.

The Lab has also developed a resource center stocked with both individual pieces of equipment and prepackaged boxes with the materials for a particular demonstration.

For example, a box Mr. Salgado brought to Belen Junior High School holds jars and a selection of bottled scents that becomes a lesson on how adult animals and their offspring recognize each other. Half of a seventh-grade class gets the jars, while the others get the lids, and they scurry about the room trying to match scents.

Teachers are uniformly enthusiastic about gaining access to such equipment as generators and lasers that even more affluent schools do not usually possess.

Some teachers also say they appreciate the



WHAT'S THIS GLOOP? In fact, that's exactly what it is — gloop, a mixture of borax, glue, and water that makes a popular play material for youngsters. Sandia Science Advisors often use gloop as a way of getting elementary students interested in the basics of science. Here, Jesús Martínez (Org. 35) demonstrates gloop to Rona Penn (1846) at a Science Education Awareness Week exhibit near the Sandia cafeteria last month. Rona is a University of Wisconsin materials sciences engineering grad student who's working at the Labs this summer.

help of a scientist because they realize that the subject is not one of their strengths.

"You only need three hours in science methodology to be an elementary-school teacher," says La Merced's Mr. Chavez.

Teachers and SCIADS added that most of the training elementary-school teachers do receive is in life sciences, rather than the physical science the Sandians specialize in.

"I never had the courage to start a science club before this," says Harriet Reid, a teacher at Mark Twain Elementary School. "I was afraid I wouldn't be able to answer their questions."

Several teachers say the experience has also increased their confidence by making science seem accessible to them, in much the same way the advisors aim to make it more accessible to students.

"I think I could have done 20 percent of the experiments last year," says Karin Swelling, a teacher at Hawthorne Elementary. "Now, I could probably do 70 percent."

### Focus on Elementary Schools

Michael Wartell, the Manager of Sandia's Education and New Initiatives Department [35], created the Science Advisors program when he was named to head the Lab's education initiative in early 1990, when all DOE research facilities were developing education programs in response to a directive from Secretary James D. Watkins.

The SCIADS program began in the 1990-91 school year with 108 advisors and 120 schools. [Numbers are for Albuquerque Public Schools (APS) only; statewide numbers are 145 advisors in 134 schools.] Mr. Wartell says 103 of the [108 APS] SCIADS "made it through the year," and 75 re-enlisted. All the original schools opted to continue.

The Sandians decided to focus primarily on el-

ementary schools because high schools are more likely to have trained science teachers, and because they think they can have a greater impact on younger children.

The program has expanded geographically. Some Sandians travel for hours to make monthly visits to Indian schools in northwestern New Mexico. In addition, 12 schools serving tribes as far away as North Carolina participate long distance, communicating with their advisors by computer, fax machines, and video phones, which transmit still photographs via telephone lines.

Officials from the [Bush] Administration and local schools appear sold on the SCIADS program.

As evidence, the local officials point to an evaluation of the program prepared by the Albuquerque school district, which compared answers on questionnaires administered to teachers, advisors, and students at the beginning and end of the school year.

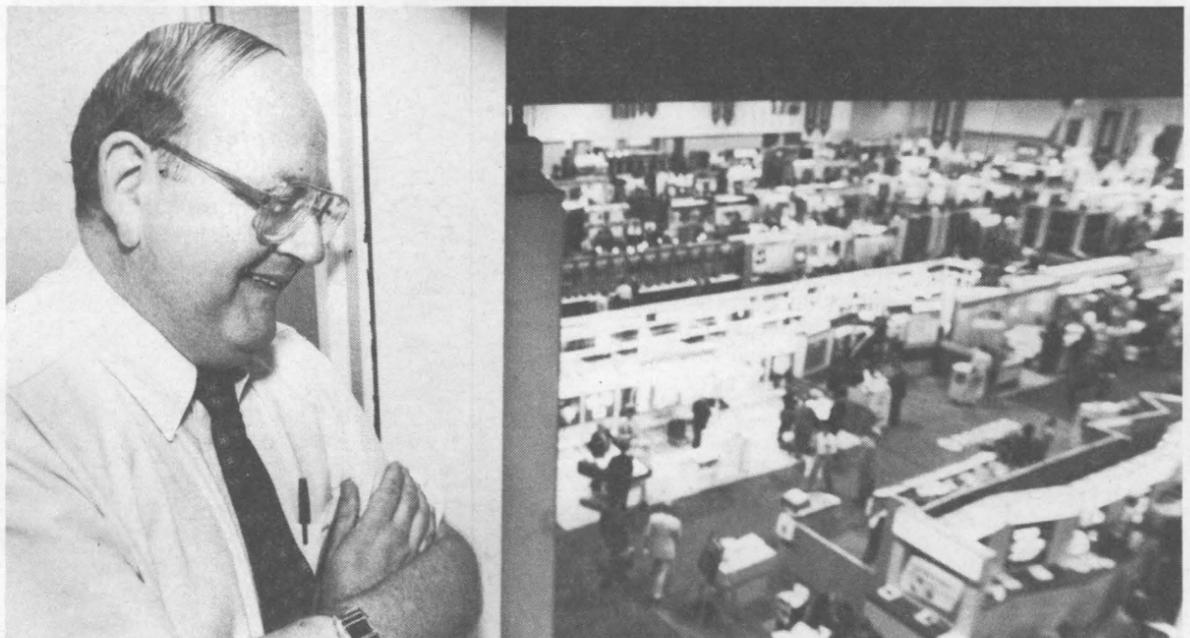
More than 80 percent of teachers surveyed said the program had a positive impact on their attitude toward science and their ability to teach it. Changes in most student responses were statistically insignificant, but the number who said they could "do scientific things on their own" rose from about 60 percent to about 80 percent.

Mr. [Rich] Stephens of the DOE [Director of Office of University and Science Education] says the Energy Department wants to measure "more than attitudinal shifts."

"We're trying to develop a strategy for evaluating this kind of program," he says.

He notes that the DOE has contracted with an educational consulting firm to evaluate the program.

"If the results are as positive as we think, there's no reason we can't replicate this," Mr. Stephens says. ●



GRATIFIED — Dennis Martin (1342), in charge of local arrangements for the 1992 IEEE International Microwave Symposium, smiles at the result of hard work. He's looking at the microwave exhibits that were part of the week-long symposium (June 1 through 5), which also included papers, workshops, special technical sessions, panel discussions, and tours that attracted more than 5,000 attendees from some 27 countries. The success of the event, one of the largest conferences ever held in Albuquerque, says Dennis, was based on the efforts of the IMS Steering Committee, which included Sandians Peg Baremore (7202), Marcelino Armendariz (1342), Tammy Ferguson (2341), and Robert O'Nan (2346).

## New Distinguished Members of Technical Staff: The Rest of Sandia's Best

As announced in the May 29 LAB NEWS, 67 Sandians were recently named Distinguished Members of Technical Staff (DMTS). About half of them were pictured in the May 29 issue; the others are seen here with their official DMTS citations.

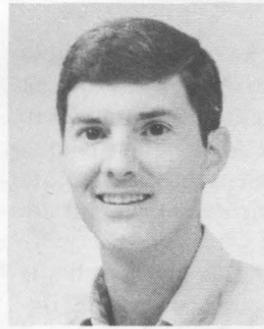
The DMTS program recognizes employees for technical excellence and demonstrated support of Sandia's corporate values. DMTSs are regarded as seasoned experts in their specialties and are, therefore, considered Laboratories resources. All nonsupervisory Senior Members of Technical Staff with five or more years of Sandia experience are eligible. Each DMTS receives an inscribed plaque, a pin, and a \$3,000 lump-sum award.

The total number of awards is limited to approximately 10 percent of the technical staff member population in each division. In all, 380 Sandians have been appointed to the DMTS level. The program began in March 1983; more DMTSs were named in December 1983, May 1985, March 1987, March 1989, and September 1990.



**Danny Gregory  
(2761)**

For his creative efforts and leadership in the simulation and measurement of vibration and shock environments.



**Paul Eichel  
(5912)**

For outstanding contributions to the field of signal processing for synthetic aperture radar that have been crucial to the success of major Sandia programs.

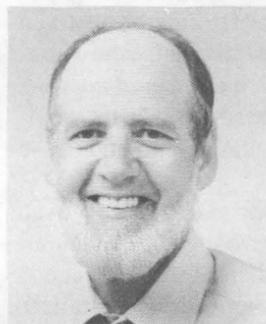
**Jeanne Lewis  
(2341)**

For leadership and significant contributions in the design and production of electronic assemblies for the nuclear weapons program.



**Edward Barkocy  
(5153)**

For outstanding contributions in the fields of JTA design, development, and production, and for development and production management of the W88/Mk-5 warhead.



**Bennie Blackwell  
(1553)**

For international technical recognition in heat transfer, visionary leadership in developing wind energy, and numerical simulations of fluid physics phenomena and other technology areas.



**Robert Nagel  
(2252)**

For outstanding and sustained contributions in the areas of magnetic component design, prototype development, and production support.



**Freddie Heard  
(5921)**

In recognition of his outstanding technical expertise and contributions as design engineer and project leader for digital signal processing and RF communication projects.

**Er-Ping Chen  
(1562)**

For sustained outstanding contribution to applied mechanics technology development and technical support of Sandia Weapon and Energy projects.



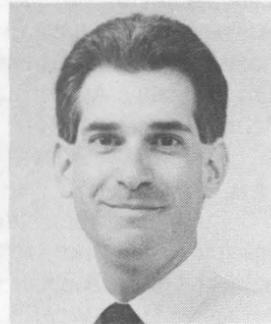
**Paul Pierce  
(2335)**

For outstanding contributions to the development of the SANDAC and Automatic Target Recognition Computers.



**Joseph Morreale  
(5711)**

For exceptional contributions in support of weapon system design, subsystem product development methodology, and the development of PAL Coded Switch devices.



**Bruce Tuttle  
(1845)**

For vision in identifying chemically prepared ceramic powders and thin film ferroelectrics as critical technologies, and research and team building to develop and successfully apply them.



**William Tarbell  
(2514)**

For broad contributions in explosive diagnostics, weapons components design, and nuclear reactor safety.

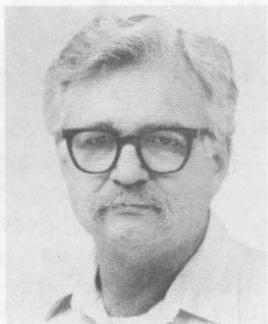


**Robert Stinebaugh  
(5165)**

For his sustained and outstanding contributions to the Weapons Program including underground testing, system design, WIPP, and the AL-SX tritium reservoir container production program.

**Roger Edwards  
(2253)**

For outstanding contributions in capacitor development resulting in significant improvements in weapon safety and reliability.



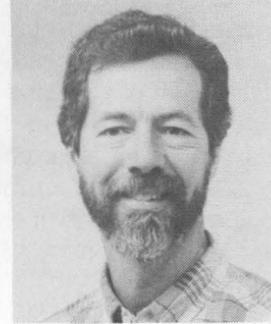
**Jay Chamberlin  
(4312)**

In recognition for numerous and sustained contributions in the fields of metrology, battery development, photovoltaics, and quality, while personally exemplifying Sandia's corporate values.



**Gary Carlson  
(6211)**

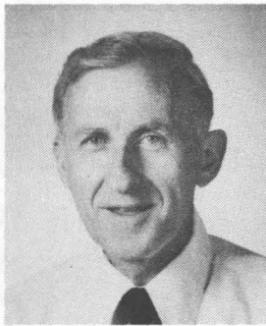
In recognition for exceptional contributions to important and diverse laboratory missions including: computer-aided modeling of coal structure, radiation diagnostics, radiation effects testing, and technology transfer.





**James Campbell  
(6613)**

For outstanding contribution to the development and implementation of tools and techniques for reliability analysis and performance assessment of complex systems.



**Charles DeCarli  
(8116)**

For sustained contributions to Sandia's technical and administrative organizations as a laboratory resource in the areas of applied statistics and component reliability assessments.

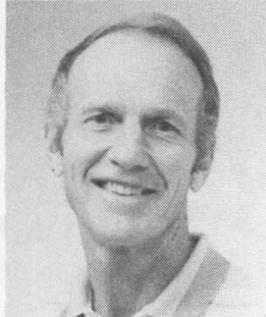


**Gerald Hochrein  
(9818)**

For outstanding management of the MaST and TDF flight test programs and for his dedication to improving the safety and quality of explosive ordnance operations.

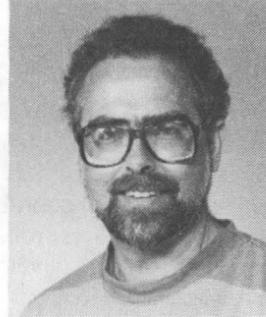
**Louis Cropp  
(6474)**

For sustained creativity, initiative, and leadership in developing weapons, safeguards, and space power systems, and for leading the resurgence of space power activities at Sandia.



**David Chandler  
(8353)**

In recognition of significant contributions to understanding fundamental molecular processes. His innovative research has led to new techniques for investigating important issues in chemical physics.



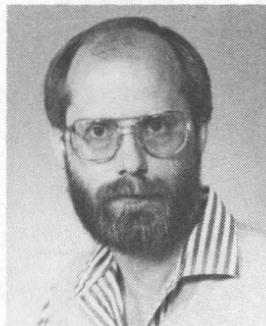
**Paul Phipps  
(9206)**

For continuing service in the development of RF and optical sensors and in real-time data processing technology for satellite treaty verification.



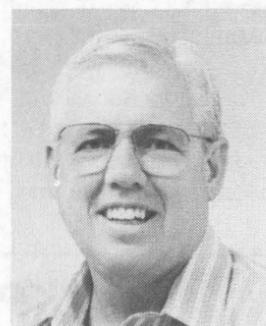
**Jake Kelly  
(6522)**

For contributions and leadership in radiation diagnostics for nuclear weapons systems certification, and in establishing Sandia's international reputation as leader in dosimetry for electronics testing.



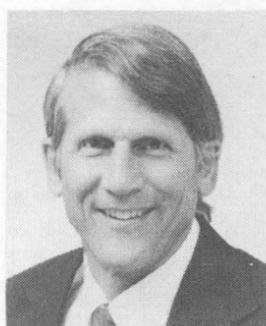
**William Even  
(8711)**

For outstanding contributions to key Sandia programs through his development and application of innovative polymer materials and processing technologies.



**Brian Brock  
(9211)**

For sustained, outstanding contributions leading to successful planning, development, execution, and fulfillment of customer expectations on projects, programs, and studies of national importance.



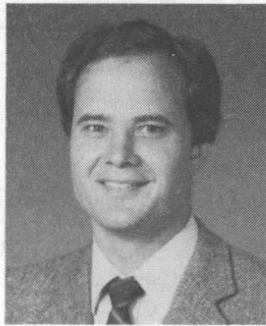
**George McLellan  
(7816)**

In recognition of outstanding leadership and technical contributions in mechanical engineering systems design and in educational service for facilities operations, maintenance, and engineering.



**Dennis Siebers  
(8362)**

In recognition of his research, technology transfer, and leadership contributions to the combustion applications and solar central receiver programs.



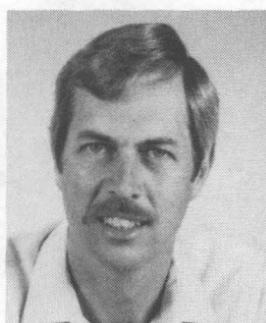
**Jacque Hohlfelder  
(9351)**

In recognition of his outstanding contributions to national programs executed by Sandia in the areas of radiation diagnostics, WIPP-related research, and radiation effects.



**Marilyn Warrant  
(7204)**

For outstanding technical contributions and performance exemplifying Sandia's corporate values of leadership, integrity, quality, teamwork, and respect for the individual in all her activities.



**Daniel Tichenor  
(8446)**

For sustained contributions in the development and application of advanced instrumentation.



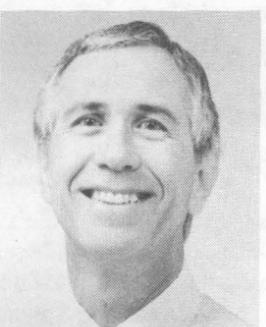
**Arian Pregoner  
(9241)**

For exceptional contributions to the physics of particle beam fusion and to technical solutions for verification of the Chemical Warfare Convention.



**Daniel Thompson  
(7715)**

In recognition of significant contributions to Sandia's radiation dosimetry program; for creativity and technical understanding leading to major achievements in Sandia's ES&H program.



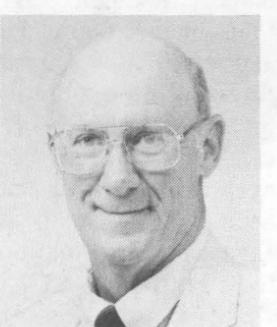
**Jesse Allen  
(5718)**

For sustained excellence in instrumentation and data handling in weapon development and nuclear testing, and in the design and installation of worldwide safeguards systems.



**George Perkins  
(4343)**

In recognition of exceptional performance in the fields of weapon component development, radiation effects testing of weapon subsystems, and data recording systems for full-scale testing.



## Sandia News Briefs

### Tech Area 1 Closed to Buses, Van Pool Vehicles as of July 1

Buses, including Sun Tran and Sanchez buses, and van pool vehicles will no longer be allowed into Tech Area 1, beginning July 1, says Jim Martin, Director of Security and Facility Support Services 3400. Gate stops and other information about the new routes will be published in the LAB NEWS or otherwise distributed to employees when details are complete, Jim says. Meanwhile, he says, questions can be addressed to Linda Stefoin (3543) on 4-7433.

### Sandia Photographer Wins Industrial Photo Award

LeRoy Perea of Photometrics and Optical Development Dept. 2756 was presented the Industrial Photographers of the Southwest (IPSW) National Award at the organization's 33rd annual conference in Albuquerque several weeks ago. IPSW is an affiliate of the Professional Photographers of America, which makes the award available through member organizations. LeRoy was honored for general achievement in photography.

### High School Teachers to Study Supercomputing at Sandia

Teachers from eight New Mexico high schools are participating in a new DOE summer program at Sandia designed to encourage interest in math, science, and computing among female, minority, and disadvantaged students. Schools in Alamogordo, Albuquerque, Estancia, Gadsden, Las Cruces, Moriarty, Oñate, and Vaughn are involved in Adventures in Supercomputing, says program coordinator Julie Swisshelm of Parallel Computational Sciences Dept. 1421. Teams of two or three teachers from each school will receive intensive training on accessing supercomputers and helping their students develop computer programs to explore real-world science problems. DOE is offering similar programs in Iowa and Tennessee this summer.

### Yucca Mountain Project Team Wins Quality Service Award

Eleven members of Sandia's Yucca Mountain Site Characterization Project (YMP) team have won a YMP Nuclear Records and Document Control Quality Service Recognition Award. Carl Gertz, DOE's YMP Manager, congratulated the team members for facilitating a move of the YMP record-processing office to a location providing more space and a better work environment, thereby increasing productivity for the entire project. Sandians cited were Kassandra Sanchez of YMP System Performance Assessment Dept. 6312 and Desiree Mirabal of YMP Management Support Dept. 6318. Several YMP contractor employees were also cited: Mary Ostrander, Eloise James, Matthew Shain, Yevetta Williams, Magdalena Garcia, Robert Macer, Emelda Selph, Debra Wash, and Jessica Thomas. Sandia's YMP Records Center is managed by Alice Hotchkiss (6318).

## Take Note

Artist Steve Hanks will hold a benefit print show for Four Corners LightHouse, the Ron Light family residence that is being used as a home for young brain-injured adults, on Saturday, June 20, at the Mirage Gallery of Graphics (3301 Menaul NE). Print preview will be from 10 a.m. to 2 p.m., and the show and artist signing will be from 2 to 6 p.m. In addition to the print show, there will be a silent auction of three sold-out print editions. All proceeds will be donated to Four Corners LightHouse, Inc., a non-profit organization. Ron Light is a former Sandian who was severely injured when struck by an automobile several years ago.

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The YWCA is offering a self-defense seminar for people with special needs (the elderly and others with disabilities and physical limitations) on Saturday, June 20, from 10:30 a.m. to 1:30 p.m. at the YWCA (7201 Paseo del Norte NE). The seminar is designed to include security issues in everyday life through awareness of surroundings, ability to read a person's intent, personal security precautions, and ability to use physical, psychological, and communication techniques to escape or defuse a potentially dangerous situation. The seminar is free for YWCA members and \$1 for non-members. For more information and to register, contact the YWCA on 822-9922.

\*\*\*

The fourth SPECTRUM International Meeting on Nuclear and Hazardous Waste Management will be held Aug. 23-27 in Boise, Idaho. Plans include optional tours of waste operations and remediation activities at the Idaho National Engineering Laboratory (INEL) and Hanford Site. SPECTRUM '92 is sponsored by the American Nuclear Society Fuel Cycle and Waste Management Division and the Society's Idaho Section, DOE, and the Atomic Energy Society of Japan. For information, contact Carol Cole at INEL on 208-526-6572.

\*\*\*

"Ancient and Historic Cultures of the Four Corners Area" is the theme for the 8th annual UNM Southwest Institute hosted by the Division of Continuing Education. The 1992 program is

divided into a lecture series (July 6-17) and a six-day field program (several field sessions are offered). The field tour includes several outliers of the Chacoan settlement area, as well as the cultural complex of Chaco Canyon. For more information about the lecture and field courses, or for a complete program brochure, contact the Southwest Institute on 277-2828 or the Division of Continuing Education on 277-CLASS.

\*\*\*

Retiring and not shown in LAB NEWS photos: Lulu Eady (153), Byron Hock (2732), and Dorothy Santillanes (7945).



## Recent Retirees



Will Ouellette  
6422 36



Joe Pelletier  
9213 36



Richard Eno  
2706 35



Ed Sanchez  
7812 28



Frank Garcia  
4343 30



Bill Riggan  
2231 37



Jesse Pfrimmer  
364 25



John Gardner  
3522 27



DISPLAYS depicting Labs technical work were part of the Science, Space, and Technology Career Expo held last month in Albuquerque. Shannon Lytle (35, left) is seen here discussing Sandia career opportunities with Taos High School students (from left) Sativa Olechea, Amanda Torres, and Erika Archuleta. This year's Expo saluted Los Alamos and Sandia national laboratories. The annual event is sponsored by The National Institute for Professional Development, a non-profit organization headquartered in New Mexico, to urge youth to pursue careers in math and science.

# Supervisory Appointments

**JEFFREY TSAO** to Manager of Semiconductor Materials Dept. 1311.



JEFFREY TSAO

Jeff joined Sandia's Ion-Solid Interactions Division in 1984 and worked on pulsed laser annealing of metals and semiconductors. In 1987, he transferred to the Compound Semiconductor Device Research Division, where he studied fundamental mechanisms of epitaxial growth. He was named acting supervisor of the Semiconductor Materials Division in 1991.

Jeff has a BA in mathematics from Stanford University, an MS in electrical engineering from Stanford, and an MS and PhD in applied physics from Harvard. He worked for the MIT-Lincoln Laboratory in Lexington, Mass., from 1981 to 1984. Jeff is a member of the American Physical Society, the Materials Research Society, the American Vacuum Society, and the Böhmische Physical Society.

He enjoys jazz and classical piano, tennis, and family activities. Jeff and his wife Sylvia (35) have had two children and live in the NE Heights.

\*\*\*

**JAMES SMITH** to Manager of Maintenance Modifications Dept. 7813.



JAMES SMITH

Jim joined the Labs in 1988 as a member of the Facilities Project Management Division, where he was a project manager and Facilities Customer Representative. His work included project management of a construction line item, general plant projects, and maintenance projects. Projects he's worked on include the new Technology Support Center, a two-story office building outside Area 5; the Gamma Irradiation Facility inside Area 5; the Master Unit substation (changing primary feeders to Area 1 buildings); the Communications Switch Building; Area 2 improvements; utility restoration; preparing building space for the DOE Tiger Team; and other maintenance projects.

Jim has a BS in mechanical engineering from UNM. Before coming to Sandia, he worked for BPLW Architects and Engineers in Albuquerque, the Public Service Company of New Mexico, and Southern California Edison. He is a member of the National Society of Professional Engineers and the Project Management Institute. He is a New Mexico Registered Professional Engineer.

Jim enjoys basketball, softball, golf, and church activities. He and his wife Vicki have two children and live in the NE Heights.

**GEORGE MAYES** to Manager of Operations Engineering Dept. 7816.



GEORGE MAYES

George joined Sandia in 1985 as a member of Stockpile Evaluation Division I, where he did B61 laboratory and flight testing. He transferred to Stockpile Evaluation Division III in 1986 and did evaluation engineering, primarily flight testing, on the W88 Mk5 Trident II. He joined the Communications Systems Division in 1991 and was project leader for the Mobile Satellite Communication Systems for Transportation Safeguards.

George has a BS and an MS in electrical engineering from Arizona State University. He served with the Air Force for 21 years before coming to Sandia. While in the Air Force, his career alternated between civil engineering and research and development, with assignments at Lowry Air Force Base; Goose Bay, Labrador; Iran; the Air Force Weapons Lab; and the Air Force Operational Test and Evaluation Center. He is a Registered Professional Engineer in Colorado.

George enjoys hunting, fishing, hiking, boating, and ham radio. He and his wife Phyllis have one son and live in NE Albuquerque.

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**CHRISTOPHER CAMERON** to Manager of Solar Thermal Test Dept. 6215.



CHRIS CAMERON

Chris joined Sandia in 1977 as a member of the Advanced Facilities Protection Division, where he developed conceptual designs for nuclear reactor security systems. He was a member of the International Atomic Energy Agency's subgroup on containment and surveillance, part of a working group on international safeguards for reprocessing plants. In 1981, he joined the Solar Systems Applications Division as a test engineer for the Modular Industrial Solar Retrofit Program. Chris transferred

to the Solar Thermal Test Facility (STTF) Division in 1984 and was project leader for construction and operation of the Distributed Receiver Test Facility. In 1989, he accepted an assignment to build up reimbursable test programs at the STTF. He was named acting supervisor of the STTF in 1990.

Chris has a BS in physics from Alma College (Alma, Mich.) and a PhD in experimental physics from Duke University. He is a member of the American Solar Energy Society.

Chris enjoys camping, cross-country skiing, and singing in his church choir. He is president of the New Mexico Roadrunners Junior Olympic Archery Development Club. He and his wife Kristine have two children and live in NE Albuquerque.

\*\*\*

**FLORIAN LUCERO, JR.** to Manager of Engineering Design Dept. I 7941.

Florian joined Sandia in 1979 as a member of Facilities Design Division II, where he designed facilities modifications, including Phase I and Phase II of Bldg. 836 modifications



FLORIAN LUCERO

and Phase I of Bldg. 802 modifications. He joined Operations Engineering in 1985 and prepared and coordinated scheduled power outages. He also did troubleshooting for power-related problems. In 1987, he transferred to Facilities Design Division I, where he was project leader and electrical engineer for various new facilities and modifications of existing facilities. Projects he worked on include the Compound Semiconductor Research Laboratory (Bldg. 893), the Integrated Materials Research Laboratory (Bldg. 897), the Integrated Systems Laboratory (Bldg. 890), and the Facilities Command Center (Bldg. 956). He was co-engineer for the 115-kV transmission line and 115-kV to 12.47-kV Master Unit Substation.

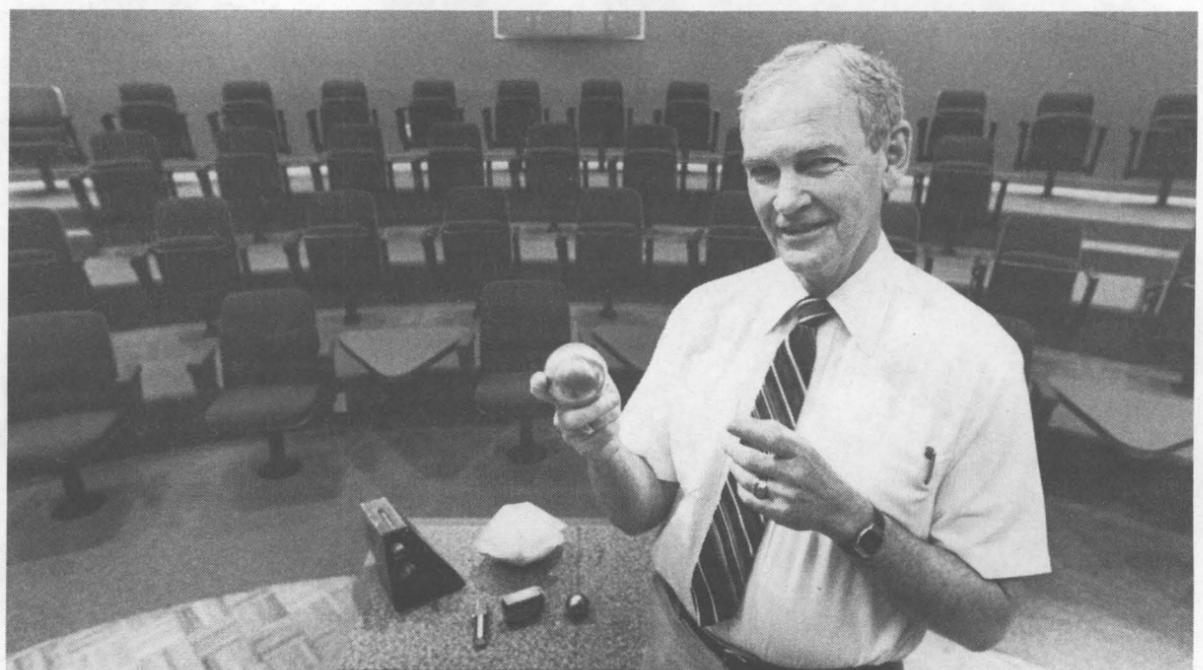
Florian has a BS and an MS in electrical engineering from New Mexico State University. He is a New Mexico Registered Professional Engineer.

He enjoys ranching, hiking, fishing, Little League, and watching baseball games. Florian and his wife Velma have three children and live in NW Albuquerque.

## Welcome

*Albuquerque* — Billy Dye (7101), Diane Cavis (21-1), Sherry Crawford (21), Clarence Drennan (7953), Shelley Eaton (21-1), Shari Garcia (3533), Marie Goldberg (21-1), Joseph Gullick (7811), Amir Mohagheghi (7715), Tammie Muniz (155), Camille Reyes (7921), Kathleen Sheehan (21-1), Anita Vigil (21), Mark Wong (7712); *Other New Mexico* — Christine Fleming (21-1), Katherine Gaither (7723), Ross Miller (7713), Charles Salazar (3915).

*Elsewhere: Colorado* — Dann Ward (7715); *Tennessee* — Michaele Brady (6643); *Texas* — Julie Chavez (3911).



**OUT OF HIS ELEMENT** — Dick Brodie (25) is seen here in an unusual setting — an empty classroom. Dick was honored recently for teaching more than 1,000 students through Sandia's in-hours technical education program, or INTEC, since 1985. The award, a special appreciation plaque, was presented during a June 3 luncheon for Sandia INTEC instructors, hosted by the Continuing Professional Development Committee and Continuing Technical Education and Training Dept. 3522. Dick teaches an INTEC course titled "Survey of Weapons Development and Technology."

# MILEPOSTS

## LAB NEWS

June 1992



Johann Besse  
3913 15



Don Larson  
1554 40



Mary Ann Seiler  
3916 15



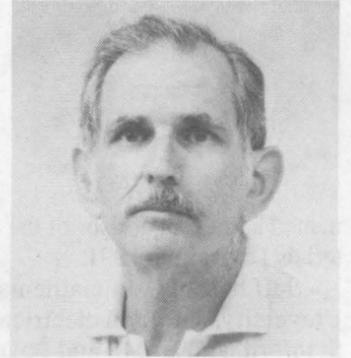
Ben Petterson  
1671 40



Paul Metoyer  
3435 25



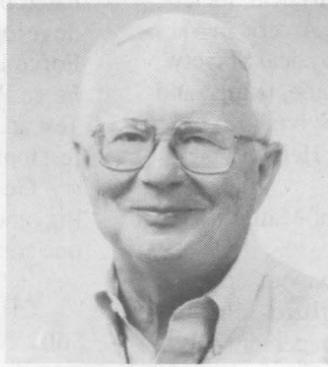
John Boyes  
1239 15



Harold Gottlieb  
5921 30



David Wenger  
1277 15



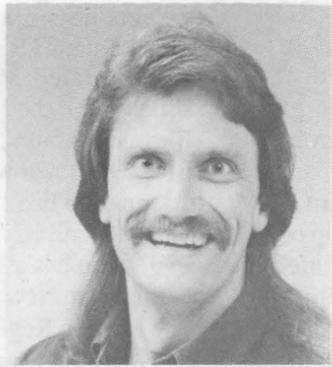
James McClure  
6641 30



Daniel Barnette  
1554 15



David Smallwood  
2741 25



Wilson Brooks  
9813 15



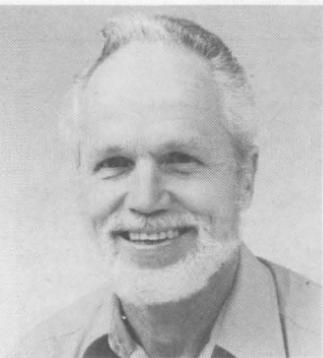
Charles Greenwood  
9212 30



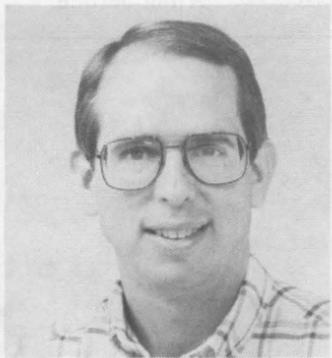
Craig Tyner  
6216 15



E. E. Alexanderson  
9812 35



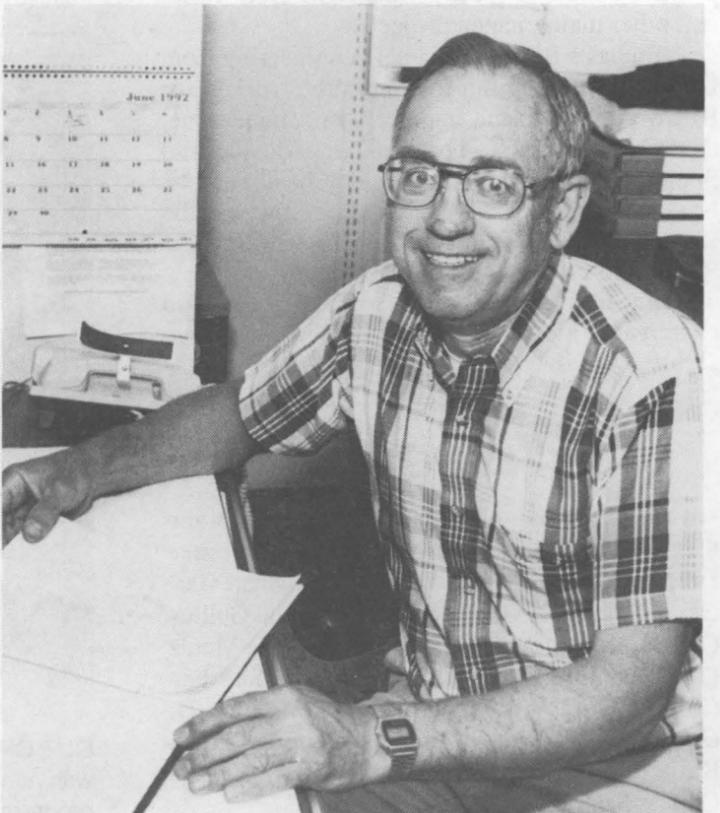
George Ingram  
5932 35



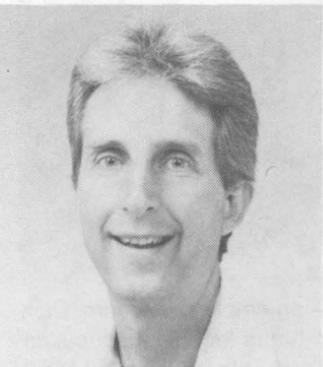
Don Noack  
1277 15



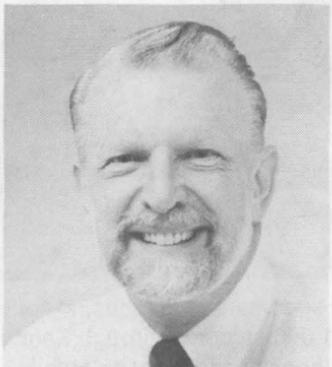
Mike Kittredge  
2665 30



Al Shaut  
2663 30



George Wagner  
3433 15



Jeff Lawrence  
1431 25



Robert Helgesen  
6621 15

## UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

**Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 3162. For questions about ads, call 844-7841.**

**Ad Rules**

1. Limit 20 words, including last name and home phone (the LAB NEWS will edit longer ads).
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same "for sale" or "wanted" item.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.
13. "Work Wanted" ads limited to student-aged children of employees.

**MISCELLANEOUS**

- PINE LIVING ROOM/DEN SET, 7-piece; trundle beds; typewriter; TV stands. Bukaty, 345-4691.
- PUPPIES: 2 female Australian shepherd cross, 12 wks. old; samoyed cross, male & female, 12 wks. old; Labrador-cross, 12 wks. old, male & female. Rex, 344-6552.
- SWAMP COOLER, 4,000 CFM, down-draft w/2-spd. motor & pump, \$150. Dodrill, 293-5464.
- PUPPIES, miniature schnauzers, registered, \$250 including shots. Lachenmeyer, 268-7818.
- DISHWASHER, 2-level, Kenmore, works, \$25. Ukena, 275-7275.
- KEYBOARD AMPLIFIER, Peavey 100W; PA speakers, 400W; Casio mini keyboard; push mower; photographic slide viewer; all in perfect condition. Peter, 828-9873.
- KING QUILTED BEDSPREAD, new, pastel, peach/green, \$50; Tiffany leaded-glass chandelier, extra chain, originally \$450, \$200. Kraft, 299-6827.
- FOUR SPACES AT SANDIA MEMORY GARDENS, \$1,200 or \$350/ea. Wolfe, 294-9967.
- UPRIGHT GRAND PIANO, Ivers & Pond, \$900. McEwen, 291-9355.
- DELMAR MINIBLIND, new, never opened, 37W x 50L, fawn color, \$12; Dodge Dakota chrome truck bumper, dented, \$15. Diltz, 899-0372.
- SHARP PC-4501 LAPTOP, two 3-1/2 drives, 1 external 5-1/4, modem, 1 serial & 1 parallel, 640K memory, IBM-compatible, \$500. Scott, 828-0467.
- BACKPACKS, large Kelty framepack, excellent condition, \$50; large frameless pack, excellent condition, \$60; daypack, \$15. Rieger, 281-0757.
- YAMAHA UPRIGHT PIANO, 52-in., 1 yr. old, ebony, \$5,600. Brown, 839-4185.
- MARANTZ TUNER, w/Bose 501s, \$85; Sony cassette deck, never used, \$60; Pro4AAA stereophones. Dieter, 296-8287.
- SOFA BED, double size, excellent condition, \$100; Kenmore sewing machine, in cabinet, \$95; student desk, \$15. Lenander, 256-0777.
- LAWN MOWER, 22-in., w/grass catcher, 3-hp Briggs & Stratton engine. Donham, 299-0028.
- JOHNSON MOBILE TRANSCEIVER RADIO, PPL6060, UHF-FM, w/antenna & mike; size 10 wedding dress, cost \$1,200, sell for \$250. Wehrle, 299-2959.
- NEW WHITE GE ELECTRIC DRYER, \$150 OBO. Howell, 828-2506.
- CHANDELIER, gold, 5 globes, many crystals. Newman, 266-6928.

- DIAMOND RING w/1 round brilliant diamond, .54ct, best offer. Wanya, 891-0018.
- SOFA BLOCK FURNITURE, structure in good condition, cushions need new covers, sofa-sleeper, love seat, rocker, chair/ottoman, end table, \$400 OBO. Clark, 293-9204.
- COUCH, love seat, & chair, earth-tones, good condition. Kallenbach, 869-5237.
- MICROSOFT WORD FOR THE MAC, 4.0D, complete package, \$150. Poulter, 291-0607.
- BORLAND TURBO C++ 1.0, \$15; games: Wing Commander, King's Quest IV and V, Chessmaster 2100, other games, \$10/ea. Bainbridge, 298-3423.
- BASSETT BABY CRIB, \$75; nursery monitor, \$20; guard rails, \$15/pr.; 2 safety gates, \$5/ea.; Bentwood rocker, \$20. Dosanjh, 293-4527.
- GRILL GUARD/PUSH BAR for Toyota 4x4, heavy-duty, chrome, new in crate, cost \$170, sell for \$95. West, 292-2271.
- POOL TABLE, bar-size; 2 wrought-iron chandeliers, best offer; ski boots, size 10, binders & skis. Schowers, 822-8494.
- DACOR COOKTOP, 30-in., 4-burner, solid element cooktop, cream/almond color, very good condition, \$300 new, asking \$100. Howarth, 897-7017.
- DINING ROOM TABLE, 6 chairs, dark walnut finish, kid-resistant surface, table extends to 7-ft. (seats 10 comfortably), \$300. Dennis, 296-4635.
- MOTORCYCLE LEATHERS, Field-sheer, red/black/white, 1-piece suit (46), \$175; Cool-Tech jacket (46L), \$75; Nelson-Rigg boots (11), \$40. Damkroger, 897-7017.
- WALNUT PLYWOOD, 4' x 8' x 1/4", G2S. James, 294-6837.
- GARAGE SALE: furniture, children's items, clothes, mirror tiles, etc., 924 Turner Dr. NE (Tramway & Lomas), Sat., June 13, 7:30 a.m. James, 298-6779.
- ROWING MACHINE, Americo 610, Deluxe model, new, \$25. Locher, 266-2021.
- COMPUTERS: AT&T 6300, 10MB hard drive, 5-1/4-in. floppy, color monitor, graphics, software; dual-floppy system, monitor; dot-matrix printer. Freshour, 256-9168 after 6 p.m.
- AMATEUR RADIO GEAR: tinkerer's delight, sell all or part, no reasonable offer refused, must clear, HF, VHF, accessories. Lambert, 293-8825.
- GARAGE SALE: June 13, 8 a.m.-1 p.m., 1921 Kriss Pl. NE, barstools, bike, toys, clothes, trombones, baseball cards, misc. items. McKay, 294-2935.
- TEAK COMPUTER TABLE, excellent condition, \$89; feather bed, never used, originally \$129, asking \$65. Stephens, 766-6674.
- BEACHCRAFT SATELLITE DISH, 10-ft., Drake receiver-tracker actuator, top condition. Baca, 265-2881.
- '77 CARDINAL TRAVEL TRAILER, 16-ft., sleeps 6, single-axle, excellent condition, clean, \$1,950 OBO. Romero, 873-1591.
- LOVE SEAT & ROCKER, rust plaid, \$40/ea.; 29-in. Pullman suitcase, w/wheels, \$30; 13-in. B&W TV, \$20; typewriter, \$20. Anastasio, 821-4245.
- LABRADOR/GERMAN SHEPHERD CROSS, blonde, 5 mos. old, male, has all shots, w/food, \$50; dog-house available, price negotiable. Kindschi, 256-0531.
- ANTIQUE PORTABLE BLACKSMITH'S FORGE, complete, \$200; wagon wheel, 44-in., \$50; 2 petrified wood posts, \$50/both. Bazar, 898-1467.
- CASUAL LEATHER SOFA, w/ironwood frame, for rec. room, \$75 OBO; matching chair, \$75 OBO. Peters, 293-6356.
- B&W LOUDSPEAKERS, bookshelf model DM1600, mint condition, walnut veneer enclosures, book value \$440/pr., asking \$420. Wessendorf, 292-2284.

- BREAKFAST SET: 48-in. dia. table, 4 chairs, \$75; light-beige ceramic tile, 50 sq. ft., \$40; router, \$30; belt sander, \$60. Hadley, 821-7324.
- DESKS, enamel gray: 60" x 18", \$30; 47" x 24", \$30; electric ice cream freezer, \$20. Roberts, 255-9527.
- ALUMINUM EXTENSION LADDER, 32-ft., Class III, \$75. Bundy, 821-1846.
- CAMPER, for full-size truck, good condition, can be seen at 11512 Morocco NE, \$300. Grasser, 292-3799.
- PROPANE TANK, 5-gal., new condition, \$25. Lagasse, 298-0977.
- GARAGE SALE: June 13, many H-O train parts, 5-drawer dresser (\$40), children's clothes, etc., follow signs, Chelwood & Indian School. Boyes, 1920 Paige NE.
- GLASS & BRASS DINETTE, \$75 OBO. Paul, 296-6500.
- AUTOMATIC GARAGE DOOR OPENER, Sears Craftsman, 1/2-hp, chain drive, like new, used only 1 year, \$100. Rader, 292-6241.
- TRAVEL TRAILER, '77 Coachman, 22-ft., self-contained, 3-way fridge, tandem axles, dual batteries, new awning, AC, full bath, \$5,300. Caldwell, 821-7110.
- TABLE, 38" x 52", extends to 70", 4 chairs, \$150; recliner, \$150; upholstered rocker, \$135; bookcases, \$50/ea.; sofa sleeper, \$300. Beardsley, 292-5910.
- SOFA (98-in.) & MATCHING LOVE SEAT (61-in.), red/gold velveteen, excellent condition, \$225/both. Morgan, 271-8489.
- FULL-SIZE DOUBLE BED, good condition, \$60 OBO. Bohne, 262-0887, leave message.
- '75 TANDEM TRAVEL TRAILER, 19-ft., self-contained, \$1,400. Carter, 821-6383.
- '87 TERRY MANOR TRAVEL TRAILER, 29-ft., excellent condition, awning, AC, sleeps 6, radio/tape, TV antenna, twin beds, microwave. Caster, 299-4308.
- DALMATIAN PUPPIES, AKC-registered, 4 show-quality males, 1 pet-quality female, have shots, available June 12. Aeschliman, 281-1227.
- SHADE KIT for '85 300ZX, black, \$75. Romero, 857-0466, leave message.
- CHEST FREEZER, 23.1 cu. ft., Kenmore, good condition, 7 trays, \$100 firm. Hines, 821-8592.
- SOLAR COLLECTOR, hot air, 4' x 33', w/fan, controls, & ducts, \$75. Yingst, 884-3812.
- SCREEN HOUSE, 12' x 12', never used, w/set-up instructions, \$75; Gaslow propane tank gauge, new, w/refill indicator & leak detector, \$15. Wilson, 344-5373.
- GUINEA PIGS, \$8/ea.; Cannon fishing downrigger, \$40. McFadden, 293-7177.
- EPSON IBM-COMPATIBLE COMPUTER, 640K, 40MB HD, color monitor, R/T clock, game port, software, \$495; professional reciprocating saw, practically new, \$80. Minnear, 281-0946.
- KENMORE ELECTRIC RANGE, self-cleaning, almond color, good condition, \$150 OBO. Ricco, 828-1997.
- EXERCISE BIKE, good condition, \$40 OBO; zoom lens, 80-200mm, \$40 OBO. Mesibov, 898-3725.

**TRANSPORTATION**

- '79 BMW 320i, silver w/blue interior, new paint, everything in very good condition. Doerfler, 823-9787.
- '81 DATSUN S10, 120K miles, 5-spd., AM/FM, sunroof, AC, new tires, \$1,200. Pompeo, 271-2576.
- '85 CLASSIC BOAT, 19-ft., deep-V, open bow, Mercruiser 140 stern drive, 1 owner, excellent condition, \$6,000, includes ski equipment. Daniel, 821-2935.
- MOUNTAIN BIKE, 20-in., 10-spd., chrome, excellent condition, w/extra parts. Ukena, 275-7275.
- YAMAHA 50QT MOTORCYCLE, original owner, 575 actual miles, excellent condition, \$500 negotiable. Schneider, 299-6243.

- '89 MERCURY GRAND MARQUIS LS, 34K miles, lots of extras, mint condition, less than NADA, \$10,500. Meikle, 299-4640.
- '83 LINCOLN MKVI, white, 78K TLC miles, runs great, computer dash, new tires, very clean, \$4,750. Baack, 822-8299.
- '90 THUNDERBIRD, loaded, alarm systems, best offer over \$10,000. Paulos, 268-2391.
- '81 SUZUKI GS650ES, Vance & Hines four-into-one exhaust, cafe-style handlebars, bar end mirrors, 24K miles, \$625. Hesch, 268-6122.
- '54 FORD CUSTOM LINE, excellent running condition. Baldwin, 821-5924.
- '72 OLDS DELTA 88, 49K miles, AT, good tires, good condition, 1 owner, \$1,200 OBO. Smith, 298-7365.
- '86 HARLEY-DAVIDSON, 34K miles, 3-1/2-gal. tank, plus saddle bags, \$3,200. Castillo, 298-7074.
- '86 CHEV. S-10 BLAZER, 4x4, 15K miles on engine, Tahoe package, great little vehicle for the mountains or camping. Drayer, 821-4017.
- '78 SEA RAY CRUISER, 30-ft., twin engine, full head & galley, excellent condition, \$25,500. Patton, 298-9987.
- BRIDGESTONE ROAD BIKE, 27-in., w/Dia-Compe & Suntour components, \$120 OBO. Poulter, 291-0607.
- '75 OLDS. CUSTOM CRUISER WAGON, 1 owner, AC, AT, PS, PB, 82K miles, \$750 OBO. Ledman, 255-6350.
- '78 HONDA 400 MOTORCYCLE, w/windshield, electric & manual start, well maintained, 1 owner. Newman, 266-6928.
- '91 CHEV. CAVALIER, gray, 2-dr., 15K miles, AT, AC, AM/FM cassette, 2 years remaining on factory warranty, \$7,800. Sanchez, 864-2933.
- '83 NISSAN SENTRA, 4-dr. hatchback, recent valve job, engine, transmission, body good, below blue book, \$1,350. Anderson, 281-5535.
- '82 MOBILE TRAVELER MOTORHOME, 32K miles, excellent condition, self-contained, new tires, AC, \$12,900 OBO. Schowers, 822-8494.
- '84 FORD RANGER XLT, 4x4, AC, tilt/speed control, dual tanks, sport wheels, good condition, \$4,500 OBO. Stephens, 766-6674.
- '81 FORD F-150, supercab, 351 cu. in., captain's chairs, PS, PB, AC, AT, shell, AM/FM/CD cassette, \$3,000. Schuster, 299-1072.
- '86-1/2 TOYOTA SUPRA, silver w/gray leather interior, AT, 78.6K miles, excellent condition, 1 owner, below blue book, \$7,600. McKeever, 299-4050.
- '85 FORD TEMPO, 4-dr., AT, AC, PS, PB, excellent condition, \$2,195. Padilla, 877-2116.
- '79 FAIRMONT, 4-dr., 6-cyl., AC, 87,700 miles, good tires, good condition, 1 owner, \$1,300 firm. Yingst, 884-3812.
- '81 VOLKSWAGEN JETTA, diesel, 4-dr., sunroof, AM/FM cassette, good condition, \$1,600. Gallegos, 266-3271.
- '85 MERCURY GRAN MARQUIS STATIONWAGON, loaded, leather interior, \$3,500. Haines, 275-2715.
- '76 HONDA GOLDWING, Vetter bags, truck & Windjammer fairing, excellent condition, \$1,250. Marshall, 298-1699.
- '79 FORD TRUCK, utility bed, 80-gal. propane tank, PS, PB, AT, runs great, \$2,100 OBO. Savage, 247-9086.
- '84 MAZDA GLC LX, 2-dr. hatchback, 5-spd., excellent mph, low maintenance, AC, sunroof, good condition, \$1,500. Robertson, 822-9804.
- '87 HONDA PRELUDE SI, 71K miles, 5-spd., loaded, white w/racing stripes, Michelins, less than \$10K miles, bra, \$7,500. Henley, 821-5457.
- '88 CHEV. NOVA, 4-dr., 5-spd., 29K miles, great gas mileage, \$4,490, trade for Dodge Grand Caravan? Greenwood, 275-8832.

- NORDIC SKI BOAT, 18-ft., 460-cu.-in. Ford, tandem trailer, new cover, \$6,900 OBO. Abbin, 296-7678.
- SAILBOAT, 77' nutshell pram, can be sailed or rowed, stable, \$700. Rieger, 281-0757.
- REPOS: '84 Cadillac Eldorado, 2-dr., 102,408 miles; '85 Dodge Charger, 2-dr., 94,463 miles; bids accepted through Tues., June 23; we reserve the right to refuse all bids; subject to prior sale. Sandia Laboratory FCU, 293-0500.

**REAL ESTATE**

- 3-BDR. TOWNHOUSE, 1,124 sq. ft., 1-3/4 baths, 2-car garage, fireplace, W&D hookup, redwood deck, \$69,800. Hesch, 268-6122.
- 3-BDR. MANUFACTURED HOME, plus land, 2 baths, open floor plan, 2-car carport, located at Paseo-Del Norte & I-25, immaculate, \$64,900 firm. Bronkema, 821-2119.
- 4-BDR. HOME, living room, den, 2,000+ sq. ft., 3-car garage, Four Hills addition, \$110,000. Selph, 296-2684.
- TWO ACRES in North Albuquerque Acres, excellent location for solar home, beautiful mountain views, \$77,900. Kallenbach, 869-5237.
- TWO-ACRE DEVELOPED LOT, near Tome, fertile, irrigated bottom land, zoning covenants, horses allowed, will finance. Aronson, 898-8893.
- '80 GOLDEN WEST MOBILE HOME, double-wide, 24' x 58', located in Ponderosa Park, Central Ave. SW, \$20,000. Patton, 298-9987.
- 2-BDR. TOWNHOUSE, 2 baths, 905 sq. ft., fully landscaped, immaculate, Taylor Ranch, \$64,900. Casalnuovo, 298-1178.
- 3-BDR. BRICK HOME, 1-3/4 baths, covered patio, attached garage, 2-car & motorhome detached garage, Carlisle/Constitution, \$99,500. Daniel, 268-8335.
- 4-BDR. TRI-LEVEL HOME, in Cherry Hills, 2-1/2 baths, 2,150 sq. ft., hot tub, wood-burning stove, 2-car garage, LCHS. Butler, 828-9273.
- 3-BDR. HOME, 23 mos. new, 1,560 sq. ft., 1-3/4 baths, 1/2-bath down, Sandia school, large living, storage, \$97,400. Mistretta, 291-9840.
- 4-BDR. MOSSMAN HOME, 1-3/4 baths, 1,900 sq. ft., double garage, pitched roof, hardwood floors, corner lot, RV pad, near schools. Yingst, 884-3812.
- 4-BDR. MOSSMAN HOME, 2+ baths, approx. 2,300 sq. ft., well maintained, \$137,900. Blankenship, 299-1422.

**WANTED**

- TANDY 100 OR 102 LAPTOP COMPUTER, reasonably priced. Rieger, 281-0757.
- ELECTRIC GOLF CART FOR CLUBS ONLY, I can still swing, I can't carry. Underhill, 294-5774 after 6 p.m.
- KITTEN, will provide good home. Tucker, 881-0247.
- ROOF-MOUNT BIKE RACK, lockable, to fit on small sedan & hold 2 mountain bikes. Howarth, 897-7017.
- RIDE-ON MOWER (Craftsman, John Deere, etc.) or small tractor w/cutting capability, must be in good condition. Kureczko, 281-8206.
- LINCOLN LOGS, prefer dark logs, partial sets okay. Torczynski, 292-7191.

**WORK WANTED**

- HOUSESITTING JOBS, college sophomore, experienced, reliable, references, reasonable rates. Caskey, 294-3218, ask for Susan.



**Coronado Club Activities**

**Give Your Family the 'Sniggles' with 'Sox'**

WHO COULD RESIST the clown duo Sox and Sniggles? They'll have the kids in stitches this evening, June 12, from 5 to 6 p.m. The fun continues with kids' bingo immediately afterward. The buffet line is open from 5 to 8 — kids can enjoy a taco, beans, rice, and soft drink for \$1.25, and adults get a taco, enchilada, beans, rice, green chile stew, and tortilla for \$2.75. (Hamburgers, hot dogs, and fried chicken also available.)

**GARY SAIZ BAND** — Next Friday, June 19, hear the Gary Saiz Band make its C-Club debut. This group has headlined shows in the Albuquerque area for several years. They'll be playing a wide variety of music from 7 to 11 p.m. Complementing the music are special dinner entrees (T-bone steak, Cajun or grilled catfish) and the famous all-you-can-eat buffet featuring baron of beef and chicken breast smothered in green chile. Make reservations early (265-6791).

**POP'S PLACE** — That's what the Club becomes on Father's Day, June 21, so bring him to

brunch. (He can wear that special new tie, or leave it behind, whichever he prefers.) Dad's Day brunch will be served from 10 a.m. to 2 p.m. — it features crepes, western and seafood omelettes, baked ham, and lots of other delectables, plus champagne to toast Dad and his day. Cost is \$8.95 for adult members, \$4.95 for children 4-12, and free for toddlers 3 and under. Guests are \$9.95. After brunch, Bob Weiler and Los Gatos will play for your dancing and listening pleasure until 5 p.m. Reservations required (265-6791).

**SPLASH DOWN** — The Coronado Club Recovery Crew is all set to take care of you on Thursday and Friday evenings to help you back to earth after the work-week's orbiting. The pool is open until 9 p.m. those evenings, an a la carte buffet is served from 5 to 8, and Club members receive a 10 percent discount on the Thursday buffet. Season pool pass holders get a special discount for Thursday bingo, plus a Thursday-Friday Pool Pass Special in the snack bar from 5 to 8.

**Fun & Games**

**Backpacking** — The American Lung Association of New Mexico's 12th annual Backpack Trek in northern New Mexico's Pecos Wilderness will be held July 8 through 12. The group will pack in from Jack's Creek Campground on the southern end of the Pecos, spend two nights at both Pecos Baldy Lake and Truchas Lakes before exiting on day five at the Santa Barbara Campground on the Pecos' northern side. A maximum of 15 participants will be accepted. Novice as well as experienced backpackers are welcome. Training materials will be provided. A special slide show and orientation will be held Monday, June 15, at the Association office (216 Truman NE). For more information, contact John Vitale at the Lung Association on 265-0732.

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**Racquetball** — Ron Loehman (1708) and his partner Tony Sanford won the New Mexico state doubles racquetball championship in the men's over-45 division on May 2 at Tom Young's Athletic Club.

**Events Calendar**

*Events Calendar items are gathered from various sources. Readers should confirm times and dates of interest whenever possible.*

**June 12 & 14** — June Music Festival: the Tokyo String Quartet, performance includes music by Haydn, Bartok, Beethoven, Janacek, and Schubert; 8 p.m. Fri., 4 p.m. Sun.; Woodward Hall, 888-1842.

**June 12-14** — New Mexico All Arabian Horse Show, call for times & events, 299-1227.

**June 12-21** — "WFS 17," Western Federation of Watercolor Societies exhibition, includes work of 94 artists in a variety of styles; 9 a.m.-5 p.m. Tues.-Sun., Albuquerque Museum, 243-7255.

**June 12-27** — "Into the Woods," Albuquerque Civic Light Opera presentation of Stephen Sondheim musical about favorite fairy tales happening at the same time in the same part of the forest, second act shows all you ever wondered about after "happily ever after"; 8 p.m. Fri.-Sat., 2:15 p.m. matinee Sun.; Popejoy Hall, 345-6577.

**June 12-30** — "Lola Alvarez Bravo: Portraits of Frida Kahlo," study of Frida Kahlo by one of Mexico's foremost photographers; 9 a.m.-5 p.m. Tues.-Sun., Albuquerque Museum, 243-7255.

**June 13** — Gallery Talk and booksigning: photographer/author Helga Teiwes and Kachina doll carver Tino Youvella; Kachina doll exhibit 10 a.m.-4 p.m., gallery talk and booksigning 1-3 p.m.; free, Maxwell Museum of Anthropology, 277-4405.

**June 13-14** — Spring Flower Show, sponsored by the National Council of State Garden Clubs, celebration of Columbus and other explorers; 2-6 p.m. Sat., 10 a.m.-4 p.m. Sun.; Albuquerque Garden Center (10120 Lomas NE), 296-6020.

**June 14** — Fine Arts Series: "Together Again," old musical favorites performed by the Company, featuring soprano Virginia Weatherill, mezzo-soprano Carmoline Grady, tenor A. V. Wall, baritone Gene Ives (5200), and pianist Lois McLeod, choreographed by Mary Aynn Clark-Shoemate; 4 p.m., First United Methodist Church (4th & Lead SW), 243-5646.

**June 16** — Tuesday Night Garden Class: "Herbs," discover how herbs add color, fragrance, and taste to your garden and home, instructor Dale Porterfield; 7-9 p.m., Albuquerque Garden Club Center (10120 Lomas NE), 296-6020.

**June 17** — Grand Canyon Evening Journeys (a series of presentations about the Grand Canyon, combined with a screening of the movie "Grand Canyon: The Hidden Secrets" in the giant-screen Dynamax Theatre): Kurt Dongoske and Leigh Jenkins of the Hopi Cultural Preservation Office in Kykotsmovi, Ariz., present "Pisivayuu: The Grand Canyon Hopi Concerns and Efforts Toward Preservation"; 6:30-8:30 p.m., New Mexico Museum of Natural History, 841-8837.

**June 19** — Gospel Extravaganza: "Sister Sadie & the Biblettes: Voices of the Folk, Golden Voices," sponsored by the South Broadway Cultural Center; 8 p.m., KiMo Theatre, 848-1320.

**June 20** — Saturday Night Wild at the Zoo, ethnic food, music, clowns, and family fun, presented by the New Mexico Zoological Society; 6-10 p.m., Rio Grande Zoo, 842-7280.

**June 20** — Antarctica Festival: cold-weather outfitting demonstration, children's activities (such as making origami penguins), presentation about the birds of Antarctica, demonstration by the Zia Dog Sled Club, talk by Victor Bravo, who spent a winter in Antarctica; 10 a.m.-4 p.m., New Mexico Museum of Natural History, 841-8837.

**June 20-21** — "Dance Across the Borders," dance concert with Compañia Jorge Dominguez, Bill Evans Dance Company, and Danzantes; 8 p.m., Rodey Theatre, 277-4402.

**June 21** — Father's Day Multi-Cultural Festival, special activities for fathers, dances performed by various Native American and other cultural groups; call for times, Indian Pueblo Cultural Center, 843-7270.

**June 23** — Tuesday Night Garden Class: "Diagnosing Plant Problems," finding out what's wrong in the garden, by instructor Curtis Smith (NMSU Cooperative Extension horticulturist); 7-9 p.m., Albuquerque Garden Club Center (10120 Lomas NE), 296-6020.

**June 24** — San Juan Feast Day, Buffalo and Comanche dances at San Juan Pueblo, Corn Dance at Taos Pueblo; for times and information, call the Indian Pueblo Cultural Center, 843-7270.

**June 24** — Grand Canyon Evening Journeys: "The Bright Edges: Visions of the Grand Canyon's Future," by Roger Clark, Grand Canyon Trust, Flagstaff, Ariz.; 6:30-8:30 p.m., New Mexico Museum of Natural History, 841-8837.

**June 25** — "Puttin' on the Ritz," New Mexico Arts & Crafts Fair preview night celebration; admission by

advance ticket only (call Fair Office on 884-9043), State Fairgrounds, 884-9043.

**June 25-28** — Festival Flamenco '92: concert of flamenco dance, music, song, with dancer La Tati and singer Talegon de Cordoba from Spain, Jose Greco, Jose Greco II, Pilar Serrano, Pedro Cortez, La Conja, Dominico Caro, Eva Encinias and Ritmo Flamenco, Pablo Rodarte, Eric Patterson, Juanito Truitt, and Alma Flemenca; 8 p.m. Thurs.-Sat., 2 p.m. Sun.; Rodey Theatre, 884-0999.

**Earnings Factors February 1992**

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	.9964
Government Obligations	1.0016
Equity Portfolio	1.0202
Guaranteed Interest Fund	1.0065
South Africa Restricted Fund	1.0161
<b>Long-Term Savings and Security Plan (LTSSP)</b>	
AT&T Shares	.9967
Guaranteed Interest Fund	1.0064
South Africa Restricted Fund	1.0164
Equity Portfolio	1.0201
Employer Stock Fund	.9969



ON AND OFF the job, Sandia photographers create images that win recognition from their peers. At last month's convention of Industrial Photographers of the Southwest, Russell Smith of Still Photo Sec. 3154-2 took best of show with "Plasma Cleaning" and Diana Helgeson of Photo-metrics Dept. 2756 won first place in off-the-job black and white with "Distant Dreams." Behind Russell and Diana are more of their photographs that received awards at the convention.