

## Developing Materials and Molecules That Could Revamp American Industry

If American companies could improve petroleum refinement to produce just a few percent more usable energy per barrel of oil, American industry and consumers could save billions of dollars during the next decade.

If researchers could structure materials atomically to produce better, more efficient automobile engines, solar cells, or computer chips, the value to the economy would be enormous.

In the past, research and development efforts that could lead to such sweeping improvements have, of necessity, been carried out on an experimental, trial-and-error basis. Progress was slow and expensive. Now Sandia, in partnership with US industry and universities, is developing ways to simulate such problems entirely by computer. This approach, if successful, should cut years and dollars from research and development programs.

Through a national effort known as the High-Performance Computing and Communications

**"You can't think of an area of American industry that isn't affected by the kinds of materials we can build."**

Program (HPCCP), supported in part by DOE and in part by industry, Sandia and several other national laboratories are researching ways to apply massively parallel computing to problems that are so complex they cannot be effectively solved with today's algorithms on today's computers. These problems are called "Grand Challenges" by DOE. In the HPCCP, Sandia has won leadership of one of these grand challenges — the Computer De-

sign of Materials and Molecules (CDMM).

The project is managed for DOE by Sandia, where researchers from at least four directorates throughout the Labs are concentrating on the development of computer simulations and related algorithms using leading-edge massively parallel computers at Sandia.

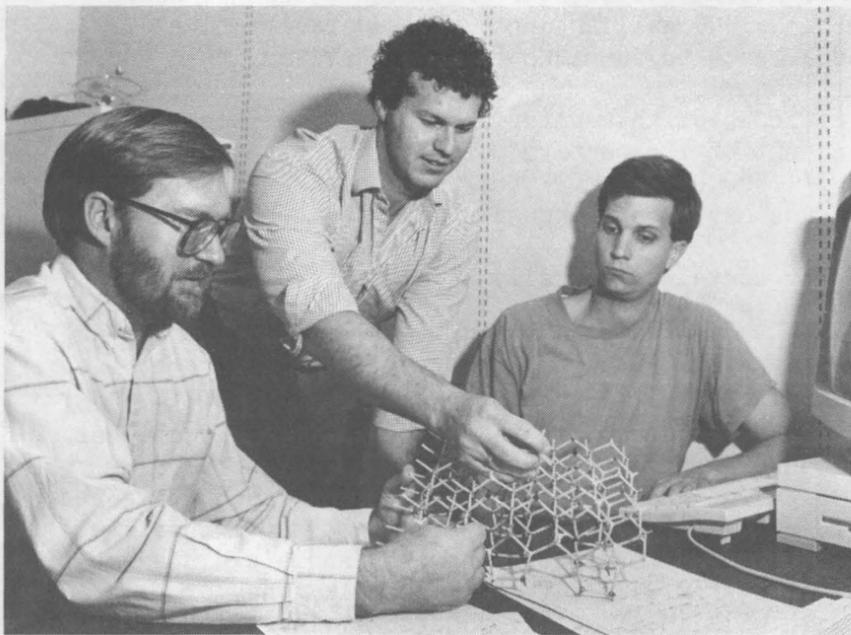
The long-term goal of CDMM is to design high-performance materials and molecules that can't be made currently, says Bill Camp, Manager of Mathematics and Computational Science Dept. 1420.

The key is to get American industry to use the new technology, says Bill. Sandia has enlisted

the support and participation of industry and educational institutions to accomplish this goal. Together, they have formed the Consortium for the Computer Design of Materials and Molecules.

Initial consortium members, in addition to Sandia, include BIOSYM Corp., the Theory Center at Cornell University (a National Science Foundation computing center), AT&T Bell Labs, IBM's T.J. Watson Labs, the University of California at Davis, Thinking Machines Corp., Cray Research, and several other national labs.

Each of the partners is contributing researchers, Bill says, and some of the industrial  
(Continued on Page Four)



**MOLECULAR MODELING** — Mark Sears (from left, 1424), Jeff Nelson (1152), and Steve Plimpton (1421) examine a model of a crystalline silicon (100) surface. The numbers in parentheses refer to the surface orientation. The researchers developed a parallel version of a quantum-mechanical program to calculate the electronic properties of solid-state systems containing hundreds of atoms. Molecular systems such as these will be simulated and analyzed by computer in the High-Performance Computing Communications Program, a new initiative supported by DOE and managed in part by Sandia.

### Labs Spends \$600 Million In New Mexico in FY91

During fiscal year 1991, Sandia's combined in-state payroll, in-state commercial purchases, and New Mexico gross receipts taxes totaled more than \$600 million. See page two for Labs-wide FY91 statistics.

### Sandia's 'Super Suppliers'

## 'Spotlight on Quality' Highlights Employees

As part of National Quality Month in October, Labs employees were asked to submit the names of Sandia's most outstanding internal suppliers — employees or organizations who use quality principles to provide quality products or services to other Sandians.

Judith Mead, Manager of Risk Management and Safety Engineering Dept. 7730, says 28 individuals and teams were nominated in all; of those, 16 were selected for special recognition. These outstanding suppliers are recognized below as part of the Labs' first-ever "Spotlight on Quality."

**Detonator Safing Stronglink Team:** Victor Johnson, Carl Vanecek, Sharon Trauth, William Greenwood, David Baldwin, Ray Burchard, Christopher Kureczko, and John Gallagher (all Surety Components Div. 2545) for working to improve quality at every phase of development from design to production, and for establishing stronger communication links with both internal and external customers and suppliers.

**Andy Phillips** of Purchasing Div. 3714 for meeting and exceeding requirements as purchasing and contract agent for two Sandia/Westinghouse development projects by soliciting customer feedback and negotiating requirements, and by documenting agreed-upon requirements to

(Continued on Page Five)

### Baking Soda Blast

## School Partners Turn Kids On to Science



BUBBLEWRAP and a helmet protect Hayes Middle School student Ian Bogost as he and his classmates are introduced to Newton's 2nd Law (force = mass times acceleration) by Ken Eckelmeyer (35).

Onlookers watched in silent anticipation as "Mount Maestas" rumbled and shook. Lava bubbled from a gaping hole at its top. Then, in a powerful blast, white froth poured over the edges, descending onto the tiny village below.

Natural disaster? Not at all. The eruption took place inside a science classroom at an Albuquerque elementary school, and Mother Nature was played by Lori Maestas (1834), one of several Sandians participating in Sandia's School Partnership Program. After the small-scale volcano demonstration, Lori passed volcanic rocks around for the students to touch and presented a slide show on real volcanoes.

Similar to Sandia's Science Advisors program, the School Partnership Program is meant to turn Albuquerque elementary, middle, and high school students on to science by illustrating scientific principles in interesting ways. Whereas science advisors demonstrate interesting teaching methods to teachers, school partners visit classrooms to illustrate scientific principles directly to students.

### First Create a Knowledge Vacuum

"Our society seems to misunderstand and even fear science and technology," says Ken Eckelmeyer (35), program coordinator. "We want to show kids that science is fun and that scientists are not 'nerds.'"

(Continued on Page Seven)

# This & That

Now, This Short Pause - It's that time of year when holidays cause us to alter our normal publication schedule. This is our final issue this month, and we will publish two more issues - on Dec. 6 and Dec. 20 - before the end-of-the-year holiday break. We publish the first 1992 issue on Jan. 10 and go back to our regular biweekly schedule.

\* \* \*

Most Misunderstood Word? - It's not even close. My choice for the most misunderstood word of all time: radiation. And it's not only the most misunderstood word, it's also one of the most misused words of all time. Free speech, it has been said, does not mean that you have the right to yell "FIRE" in a movie theatre. But it has become painfully obvious that misinformed people can yell "RADIATION," needlessly scare the daylights out of other people, and bring activity to a halt about any time they care to.

If you live in or around Albuquerque and haven't read or heard about the flap over the 50,000 gallons of so-called "radioactive wastewater" that Sandia wants to put into the sewer system, then you've been holed up mighty tightly.

Here are some facts about this water and some comparisons:

(1) The total amount of radioactive material in the entire 50,000 gallons is less than 1/1,000,000 gram. Put 1 million times this much material together and you have something weighing about what a penny weighs.

(2) The human body contains naturally occurring radioactive potassium-40 at a concentration of about 1.6 picocuries per milliliter (pCi/ml), more than seven times as high as the Sandia water.

(3) Actual measurements - by Sandians Marshall Berman (6460A), Dick Bild (6454), and John Kelly (7713) - of the radioactivity level of this Sandia wastewater, compared with the radioactivity levels of beer and milk bought in Albuquerque: wastewater, 0.22 pCi/ml; beer, 0.28 pCi/ml; and milk, 1.35 pCi/ml. So beer is slightly more radioactive than the Sandia wastewater, and *milk is more than six times as radioactive.*

I'll bet nearly all of the people who oppose Sandia's discharge of the water into the sewer system will either drink milk today or drink/eat something with milk in it, thereby directly ingesting something that's six times as radioactive as the wastewater. Many of these people are well-intentioned, I'm sure, but badly misinformed. And it's a shame when misinformation rules.

\* \* \*

Medical Switch - Linda McEwen (3545) reports that more than 1,600 employees and retirees in the Albuquerque and Santa Fe areas have chosen to switch to the new Health Maintenance Organization plan - the Lovelace Health Plan - that goes into effect on Jan. 1. With about 10,000 eligible employees and retirees, I figure that's about 16 percent who chose the HMO and 84 percent who chose to stay with the traditional Medical Care Plan. I'm pretty proud that I didn't even have to take my shoes off to calculate these percentages.

\* \* \*

New Math? - I've sometimes joked that mathematics steered me toward journalism, and I think I recognize some writing by a person of similar ilk. From a recent news release discussing crime statistics in Albuquerque: "Year to date, crime has decreased by -3.5 percent." ●LP

## Sandia's Payroll Tops \$425 Million

Sandia's payroll for fiscal year 1991 totaled \$425.5 million. Of that amount, \$368.8 million went to the approximately 7,400 employees located in Albuquerque and \$53.3 million went to the 1,050 employees at Sandia, Livermore. The other \$3.4 million went to employees at the Tonopah Test Range in Nevada. On Sept. 30, Sandia had 8,607 total on-roll employees.

During the same period, Sandia spent more than \$600 million in New Mexico. This figure takes into account employees' salaries, in-state commercial purchases, and New Mexico gross receipts taxes.

Sandia purchased goods and services worth \$489.7 million from commercial vendors in FY91. Of that amount, \$216.8 million was spent in New Mexico, and another \$95.2 million was spent in California. Sandia also paid \$43.7 million in New Mexico gross receipts taxes.

A study released last year by DOE and NMSU showed that Sandia, directly and indirectly, accounted for 6.5 percent of the total economic activity in New Mexico. ●

### Earnings Factors August 1991

#### Long-Term Savings Plan for Management Employees (LTSPME) Earnings Factors

AT&T Shares	.9778
Government Obligations	1.0156
Equity Portfolio	1.0223
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	1.0290

#### Long-Term Savings and Security Plan (LTSSP)

AT&T Shares	.9777
Guaranteed Interest Fund	1.0072
South Africa Restricted Fund	1.0291
Equity Portfolio	1.0225
Employer Stock Fund	.9779

### Welcome

Albuquerque - Tania Carson-Zierer (21-1), Gregory Corbett (3442), Benita Gonzales (21-1), Mary Loukota (21-1), Linda Schulz (21-1), Jeanette Smith (21-1), Mary Thies (21-1); Other New Mexico - Annette Chavez (21-1), Veronica Lopez (21-1).

## LAB NEWS

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### Favorite Old Photo

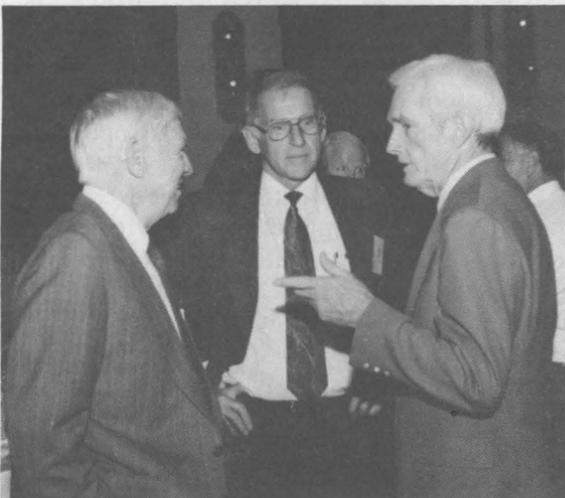
SALTON SEA SANTA - In 1955, my sister Edith and I (twins near Santa) and our brother Jimmy (behind us) met Santa at a Christmas party at the Salton Sea Test Base in California. The base was used for weapon drop tests in the '40s and '50s. My father, James Hall, was on the guard force at Salton Sea. We transferred to Albuquerque when the base closed in 1960. Dad retired from Sandia six years ago. Linda Hall, 3426



COMING FROM states including Wisconsin, Arizona, Oregon, Nevada, Colorado, and Washington, many of the 320 retirees and guests who attended the

26th annual Sandia retiree dinner at Castlewood Country Club last month gathered for a group photo. (Photos by Bud Pelletier, 8275)

## Livermore Retirees Enjoy Annual Dinner Program at Castlewood



AFTER-DINNER CONVERSANTS are (from left) George Anderson, VP John Crawford (8000), and Dick Claassen.



ENJOYING some reminiscences are (from left) Joan Brumleve, Josiane Selvage, Tom Brumleve, Clif Selvage, and Roger Barody.

### Flying NASA's Skies

## Former Sandian Talks about Space Shuttle Training

The early image of astronauts as the macho pilots portrayed in the book and movie "The Right Stuff" has changed, says Ellen Ochoa, former Sandian and current astronaut-in-training at Johnson Space Center in Houston.

Many astronauts preparing today for space missions are highly educated scientists, she told a Labs audience during a recent visit to Sandia, Livermore. Experienced pilots still must guide the craft, but most astronaut candidates have advanced degrees in technical fields.

Ellen was introduced by her former supervisor, Don Sweeney (8351), with whom she worked in the Imaging Technology Division from 1985 to 1988 before taking a job at NASA Ames Research Center in Sunnyvale. Don noted that of 95 trained astronauts in the US today, 17 are women, and that Ellen is the first Hispanic woman astronaut.

She also spoke to 150 science students at Livermore High School.

Ellen hopes to be assigned in the next few

months as a mission specialist for a scheduled space-shuttle flight. After receiving an assignment, she will train for 12 to 18 months in specific mission tasks, which could range from conducting on-board experiments in any field of science to walking in space.

Although the present-day astronaut training program concentrates on classroom studies, the participants also undergo detailed, thorough medical examinations and strenuous physical training.

### Ants for Lunch?

They have survival classes such as "101 ways to use your parachute" in the wilds, ranging from sewing it as a sleeping bag to tearing it into giant strips for displaying as an "X" to be spotted by rescue aircraft. The program also includes scuba training, and there's the experience of being deposited into the ocean in a life preserver, inflating a raft, guiding Coast Guard helicopters, and being hoisted from the sea. Astronauts learn to use flares as shark repellents, eat ants for survival, and be ejected from a simulated aircraft at three times the force of gravity.

Ellen's flying sessions included spending time  
(Continued on Page Nine)



ELLEN OCHOA, former Sandian and now a member of the NASA astronaut class of 1991, visited the Labs recently. (Photo courtesy NASA)

### Congratulations

To Wendy (8531) and Ed Dolstra, a daughter, Nicole Shyanne, Oct 26.

**Teaching Science, Homemaking, Law Enforcement****Property Reapplication Benefits Public**

More than recycling has been learned from Sandia's Property Reapplication Div. 3422. Thanks to special Sandia loans and outreach programs, old materials are teaching new lessons at schools, shelters, and even the New Mexico Law Enforcement Academy.

In the schools, Sandia's educational outreach program — created last year as part of a DOE effort to expand the educational involvement of national labs — is reapplying property that can aid the teaching and learning of science.

For example, students at the University of New Mexico will do hands-on research with a plasma etcher loaned this year through the involvement of Education and New Initiatives Div. 35. "Many schools come to us with their needs," says

**"Many schools come to us with their needs."**

Ellis Heustess (35). "We in turn go to Property Reapplication to see if we can help."

Part of the educational outreach program involves lending schools certain types of excess equipment through the signing of a memorandum of agreement. For example, UNM was recently loaned almost a million dollars' worth (original purchase price) of equipment. Such loans, Ellis says, let colleges and universities use excess equipment from finished Sandia projects, equipment they could not otherwise afford.

**Teachers Get Science Kits**

But students don't have to wait for college to benefit from Sandia's reapplied material. "A large portion of our outreach," says Paul Page (35), "is aimed at kindergarten through grade eight. We're working with educational institutions to support teachers and students in science, mathematics, and engineering education.

"By working with Property Reapplication," he continues, "we've been able to establish an excess equipment loan program with many New Mexico schools. We assemble some of the excess equipment into science kits that teachers use for demonstrations. We also loan computers, microscopes, and similar equipment for educational purposes. Mickey Sanchez of Property Systems Div. 3421 has been extremely helpful in establishing a loaned-property system and maintaining records of the loaned equipment."

Sandia's outreach program now includes

*(Continued from Page One)*

**Computer Design**

partners are putting matching funds into the consortium.

"You just can't think of an area of American industry that isn't affected by the kinds of materials we can build," notes Bill. "Currently, materials science is largely a lab science, meaning the design of new materials is an empirical search. This is a very expensive, trial-and-error process.

"Clearly, if we can accurately and rapidly simulate the experimental process on a computer, we can identify promising molecular structures more quickly. We can verify the results with fewer experiments. And we can greatly reduce the time and cost needed to develop new materials."

**Design of Catalysts, Chips, Alloys**

The major thrust of the computing initiative in 1991 is to start several projects in catalysis.

Catalysts initiate chemical reactions but are not changed or consumed by them, and thus can be used over and over again. Examples in nature are enzymes that control growth, digestion,



**ROPING DOWN** — Lt. Pat Wood demonstrates an outward-facing "Australian descent" at the New Mexico Law Enforcement Academy's new rappelling tower. Wood is the New Mexico State Police Tactical Team Commander. "The tower is an excellent training tool for the law enforcement officers of New Mexico," he says. "We appreciate having it." The tower was built with excess materials from Sandia and Kirtland AFB.

(Photo by Randy Montoya, 3162)

almost 140 Sandia Science Advisors. Property Reapplication provides Science Advisors with computers, models, and other visual aids used in demonstrations given in schools statewide.

**Uniting Families**

Science is not the only subject aided by Sandia efforts. At the All Faiths Receiving Home, volunteers give lessons in homemaking and parenting skills. A non-profit, non-denominational crisis center housing 35 to 40 battered children daily, All Faiths is a United Way agency established to combat child abuse and help unite families.

Ann Riley (3726), a Sandia Purchasing contracting representative and member of All Faiths'

or photosynthesis.

In industry, catalysts currently exist that help break down oil or hydrocarbons. They could also be designed to remove carbon dioxide from the atmosphere, and remove oxygen atoms from carbon dioxide in a smokestack and replace them with hydrogen atoms to produce more hydrocarbons for fuel (a process called "reduction").

"Catalysts we're interested in," notes Jeff Nelson (1152), lead staff member for CDMM, "include suspensions of fine-metal clusters of a few hundred palladium atoms in a solvent. Materials such as palladium are used to catalyze many gas-phase reactions. These unsupported metal clusters provide a lot of surface area for reactions. We would like to restructure them to increase and enrich the surface area and make them into better catalysts for producing such things as low molecular-weight, cleaner-burning fuels in the petroleum industry."

**Help Regain US Lead in Microelectronics**

In addition, says Jeff, computer design of microelectronic materials such as computer chips could help the US regain its lead in the microelectronics industry. Because the speed at which computers solve problems is limited by the mate-

Board of Directors, says the center has all the needs of a regular home yet limited money for necessities. "All Faiths was in desperate need of such things as furniture, cabinets, and shelving," says Ann. "Though Sandians have first priority for all Property Reapplication items, and other federal agencies must also be given the opportunity to acquire them, the State Purchasing Act then allows state agencies to receive donations. For a small fee, the shelter was able to receive a computer, tables, and cabinets."

**Supporting Public Safety**

Property Reapplication now plays a part in training officers to save lives. The New Mexico Law Enforcement Academy in Santa Fe, which trains State Police and local law-enforcement officers from throughout New Mexico, is upgrading its curriculum and facilities. Ann also serves on the Academy's Board of Directors. She suggested that Academy representatives visit Sandia to discuss what Sandia Security has done for training and to investigate concepts that might be adopted by the Academy.

"The Academy visitors were eager to collaborate with the Labs," says Ann.

Working with Keith Chavez (3154), who was then Supervisor of Property Reapplication Operations Sec. 3422-1, and Ken Mock of New Mexico's purchasing organization, the Academy was able to obtain a paging system, floodlights with a generator, and materials to build a rappelling tower. Between Sandia and Kirtland AFB Property Reapplication programs, the Academy was able to get almost all the materials needed to update and improve its training system.

Sandians don't have to send their excess material to Property Reapplication for it to be put to worthwhile use, points out Dan Poole, Supervisor of Property Reapplication 3422. "The material exchange program, which involves listing available items in the *Weekly Bulletin*, is a way of having material reapplied directly within the Labs," he says. "And anyone who has something that might be suitable for school use — excess personal computers, for example — may contact the educational outreach office [Education and New Initiatives Div. 35] and see if there's a need."

Dan also says that Sandians or people in schools or other agencies can find out about what excess property might be available, and how to look into obtaining use of it, by calling Tom Cordova on 844-7785 or Carolyn Lucero on 844-2342. •DT

rials used in chips, chip performance can be significantly improved by tailoring materials such as gallium arsenide and silicon to achieve greater efficiency and reduced feature size.

High-grade materials designed by computers would have many potential applications. For example, says Steve Plimpton (1421), a CDMM re-

**"We would like to use computers to model high-strength, corrosion-resistant alloys."**

searcher studying massively parallel methods for materials simulation, "We would like to use these computers to model high-strength, corrosion-resistant alloys that are of interest to the automotive and aerospace industries."

Within the next decade, he predicts, massively parallel computers will be able to simulate macroscopic processes involving millions of atoms, such as the propagation of cracks in structural materials

Many organizations in Albuquerque and Livermore are or will be involved in the High-  
*(Continued on Next Page)*

(Continued from Page One)

## 'Quality Spotlight'

eliminate any misunderstanding about time schedules and deliveries.

**Daniel Rondeau** of Engineering Methods and Specifications Div. 2833 for accommodating a customer by completing in record time an unplanned weapon design task not included in the customer's original request.

**Mike Heiser** of Desktop Systems Div. 3127 for his timely, adaptable, and sometimes unsolicited but welcome computer technical support of Illustration and Design Communications Div. 3155 during the past year.

**Livermore-site Quality Process Management Team:** Cliff Yokomizo (5301), Norm Wagner (5313), Paul Van Dyke (8275), Ron Stolz (8316), Henry Hanser (8440), Ed English (8445), Corey Knapp (8536), and Jim Bartel (8441) for developing and communicating a Site Quality Plan and for supporting several Livermore quality teams.

**Chuck Walker** of Thin Film and Brazing Sec. 2471-2 for supporting internal Labs customers by modifying lab equipment and developing calibration techniques to produce unique vacuum deposition specimens, and for completing these tasks promptly.

**Allison Kane and Jeanne Evans** of Quality Support Div. 4311 for supporting the Org. 200 Process Management Team by attending all meetings and providing valuable guidance about quality processes to the team.

**Betty Lord** of Distribution Sec. 3744-2 for consistently exceeding her customers' require-

ments as a dock worker by going out of her way to check on rush deliveries, by keeping informed about pending deliveries and policies, and by always being available.

**B83 User Satisfaction Team:** Don Starkey, Jerry Huntting, Debbie Post (all 5362), Chris Christensen (5513), Rex Eastin (5365), and Irene Dubicka (5512) for providing guidance to, and soliciting feedback from, internal and external customers of the B83 strategic bomb and for continuously improving processes that lead to the final product.

**Cliff Condit and Gilbert Lucero** of Instrument Services Sec. 2414-1 for meeting and exceeding the needs of customers by providing timely instrument design and calibration services as well as consulting customers about how best to solve their instrumentation problems.

**Deanna Sevier** of NDT (Non-Destructive Technologies) Technology Div. I 2752 for understanding and meeting her customer's needs during a transducer analysis project that required results in record time, and for offering her expertise for using NDT in future projects.

**T. B. Hobart**, Supervisor of Project Machining Sec. B 2481-5, for suggesting improvements in rough-draft drawings of mechanical hardware to be machined so that the quality of the final product is improved, and for suggesting time- and cost-saving modifications of the hardware.

**Sharon Kurtz** of Operating Systems and Development Services Div. 3124 for working to make available to Labs employees a new Office Vision electronic mail system by soliciting input from organizations Labs-wide and by enhancing the system to meet the needs of each of these organizations.



BETTY LORD of Distribution Sect. 3744-2 was nominated as an outstanding supplier by Joann Danella (250) for always going out of her way to check on rush deliveries, for keeping informed about pending deliveries, and for being available.

**Jonathan Lee** of NTS Instrumentation Development Div. 9321 for supporting "Distant Zenith" experiments by constantly communicating and documenting procedures with Sandia customers and by characterizing cables and putting data compensation software in place in a timely manner.

**Kevin McCurley** of Theoretical Computer Science Div. 1423 for developing flexible and user-friendly software for allocating parallel computer resources and for soliciting input from various groups about the usefulness of such software.

**Jim Davis** and Transportation Sec. 3423-1 for providing efficient transportation services, for asking questions about how to best fulfill customers' needs, and for providing timely feedback to customers.



(Continued from Preceding Page)

Performance Computing Communications Program, including Computer Sciences and Mathematics 1400, Solid State Sciences 1100, Combustion & Applied Research 8300 at Sandia, Livermore, and Advanced Energy Technology 6200. Though Sandia only recently received jump-start funding for the program, researchers using massively parallel computers have already taken a significant initial step — they have developed the capability to do electronic structure simulations for semiconductor and metal surfaces containing hundreds of non-equivalent atomic sites. Non-equivalent sites are differing areas on the same surface that are not alike, because they have different kinds of chemical bonds and thus exhibit different chemical behavior.

"If we could achieve just a few percent improvement in the way we refine gasoline such that we get a few percent more energy output per barrel of oil, and do it a few percent more cheaply, that would translate into a savings of \$100 billion over a decade," says Gary Carlson (6211), a CDMM staff member pursuing design of advanced catalysts. "That's something we really believe we can achieve." ●LD

# flexed kiback

*Q: In his "1991 EEO Policy Statement," sent to all employees, Sandia President Al Narath states forcefully that Sandia has a commitment to "ensure that equal opportunity is practiced in all aspects of the employer-employee relationship." He elaborates on this by describing how the total range of opportunities at Sandia will be available to Sandia's employees "without regard to race, color, religion, sex, or national origin."*

*Nowhere in his page-long document does he say anything about Sandia's policy regarding employee opportunities with respect to age. Why was this attribute omitted? I, for one, can only conclude that Sandia's management considers age a far less important employee characteristic than "race, color, religion, sex, or national origin," and that Sandia has no significant policy to protect its employees from age discrimination.*

**A:** The first line in the second paragraph of Al's letter states that Sandia policy is to conduct all corporate activities in accordance with the letter and spirit of all applicable equal employment opportunity laws and regulations, including Title

VII of the 1964 Civil Rights Act, Executive Order 11246, "Age Discrimination in Employment Act of 1967." The Age Discrimination Act prohibits age discrimination in all employment decisions.

Al's statement has been revised to include the following: "We recruit, hire, train, and promote persons in all job titles, without regard to race, color, religion, sex, or national origin and in accordance with the laws and regulations concerning age, handicap, and veteran status." We are sorry there was a misunderstanding and would like to take this opportunity to reaffirm Sandia's policy of ensuring all employees fair and equitable treatment.

Ralph Bonner (3500)



# Leadership Conference Focuses on Customers, Future

Sandia's Fall Leadership Conference (week of Oct. 28) for Large Staff (directors and above) encouraged senior managers to work more responsively with Sandia's customers, internal and external.

The strategy was to draw on Sandia's strengths — its values, its talent, and its commitment to exceptional service in the national interest — to overcome barriers that can arise between customers and suppliers.

The theme, fittingly enough, was "Our Customers: Our Future."

"What we wanted to do was to give each member of Large Staff a clearer understanding of Sandia's customers' needs, wants, and expectations," says Larry Bertholf (4400), head of the Fall Leadership Conference (FLC) planning committee.

## Simple Structure

The FLC structure was simple. Focus the first day on the need to use Sandia's values in decision-making and other managerial tasks.

On the second day, do something that's never been done before — invite some key external customers to provide candid assessments of what Sandia is like to work with. Make sure that support groups as well as sector groups hear the same messages.

To check on how well members of management understand what they've heard, mandate face-to-face meetings that include members of the three sectors as well as members of support groups. (The sectors are Defense Programs, Energy and Environment, and Work for Others. Support groups include Lab Development, Core Competencies, Direct Support, and Indirect.)

Follow that day with a day devoted to processes for measuring customer satisfaction by using the Malcolm Baldrige quality criteria.

And, on the final day, motivate management members to reconnect with their front line people back on the job.

## Did It Work?

The conference ended with written evaluations of its effectiveness (see "More But Less, Please"). From the point of view of Planning Committee members, the FLC blurred some traditional organizational boundaries, opened some eyes to the barriers between Sandians and customers, and pointed out the tendency to take our values for granted.

On the latter item, Planning Committee member Paul Brewer (8500) noted that the group did well at assessing its collective ability to live by Sandia's traditional values.

"The really tough part, of course, is whether we can continue that focus back on the job," notes Paul. "We tweaked some sensitivities a bit, so I believe we can expect to achieve some incremental changes in behavior on the part of senior management."

"We needed to get firsthand — and in the same place at the same time — the message from key external customers," says Joan Woodard, another Planning Committee member. "And the 'we' here certainly includes management from the support groups as well as the sector groups that relate most directly with those customers."

"Anecdotal evidence, at least, suggests that putting these players in the same room worked well," she continues. "One director told me later that the experience was eye-opening, because 'our customers sometimes know us better than we know ourselves!'"

## Be Totally Candid

"We asked our speakers to be totally candid in describing their views of Sandia's strengths and weaknesses," says Planning Committee member Paul Robinson (4000). "And they were. I was delighted. The stage was set for Wednesday, the day

## More But Less, Please

The senior managers who attended the Fall Leadership Conference had to provide four pages of conference evaluation or go without lunch on Friday.

Ninety-plus percent of the reactions to the FLC were strongly positive, especially in the areas of increased understanding of customers and increased cooperation among internal groups.

Weak points identified range from the need for clearer expression of the Labs' strategic intent to the need for more comfortable chairs in the meeting room.

Most respondents suggested spending more time on each of the issues raised at the FLC — but most of them also suggested a shorter conference next year.

Copies of the statistical results are available to any Sandian. Please call Julie Walker (4400) on 4-8004.

we focused on internal customers.

"We were worried about Wednesday," says Committee member Bob Eagan (1800). "The committee thought that we could have some serious disagreements between sector people and support people as we asked them to deal with each other as customers and suppliers."

"But no. In fact, the commonality across the groups was startling. Members of each of the various constituencies agreed closely on what they need from each other to allow Sandia to satisfy its external customers."

## Tremendous Hope for the Future

President Al Narath, commenting later on that "internal focus" day, put it this way: "I really got turned on by the extent to which the various special interest groups in this room could agree so easily. The issues were the same; the potential solutions looked the same. The team really is coming together. . . . It gives me tremendous hope for the future."

"As we move closer to our customers, we need

a process to measure their satisfaction with our services," says Bob Zaeh (3700), who headed up the Thursday session.

"The Malcolm Baldrige criteria provide a proven way to measure customer satisfaction. They've been proved in other businesses, and we in Purchasing have used the criteria long enough to conclude that they provide a non-prescriptive, introspective approach to improving the satisfaction level of our customers."

## Vertical Partnerships Needed

"I believe that we got across the need to form more vertical partnerships in our organizations," says John Stichman (2330), a member of the Planning Committee who focused on Friday, the "re-connection" day at the FLC.

"That way, all levels of management can be as aware as possible of the work being done to serve customers — and can create a climate in which service to the customer is a major performance criterion."

"Our customers *are* our future. All of us on the committee believe that like we believe nothing else," concludes Paul Robinson (4000). "If the FLC convinced our fellow members of management that we're right — and if *they* can convince their constituents back home — then the conference will be a major step in ensuring the future of the Labs."

The head of the FLC Planning Committee, Larry Bertholf (4400), looks back on the conference with pleasure and pride.

"I'm pleased with the results of the Fall Leadership Conference, and I'm proud of the contributions of our team and the facilitators [from Organizational Effectiveness Div. 4302] who helped keep us 'on task.'"

"I'm especially proud of the planning process we developed. With it, plus the customer evaluations we received, next year's conference should be even better."

Conference planning for next year will be headed by Bob Zaeh (3700). He'll be assisted by Joan Woodard (6600), who will lead the effort in 1993. ●BHawkinson(4302)

# feed iiback

*Q: Who at Sandia determines when and if there will be a weather-related starting time delay?*

A: Here is the policy:

"The decision for Sandia National Laboratories, Albuquerque employees to leave work early or arrive late because of severely inclement weather is fundamentally an emergency response decision.

Accordingly, the decision to leave early or arrive late shall be made by the Director of Security and Facility Support Services, 3400.

Once the decision is made, the Manager, Public Relations Department 3160, will disseminate the information."

The public relations manager disseminates the information to TV and radio stations.

This policy was approved March 9, 1990, and supersedes all prior policy statements on the matter. Herb Pitts (3100)

*Q: Overnight mail, such as Federal Express, is currently delivered to the Sandia warehouse, logged, distributed to buildings, and distributed within buildings. If an envelope arrives at Sandia at 10:30 a.m., the recipient is fortunate to get it before 1 p.m., unless he/she goes to Bldg. 957 to pick it up. Such a system defeats the purpose of overnight mail.*

*Is it possible to designate other points outside the security areas, such as the reception desks in Bldgs. 800 and 823, for receipt of overnight deliv-*

*eries? Given a street address, this should not be a problem for the carrier. Also, to lighten the load at these designated points, I recommend limiting the items that could be delivered there to envelopes. Items not picked up on the day of delivery could be placed in the office mail.*

A: Receiving, in Bldg. 957, is set up to receive boxes and packages for Sandia employees. Most of these materials have been purchased. Overnight or express mail is brought to the warehouse at around 10:30 a.m. daily and is processed and delivered beginning at about 1 p.m. All packages, envelopes, and boxes are handled in the same manner. Our goal of delivering most shipments by early afternoon allows recipients to get them before the close of business. The suggestion to put items in the corporate mail that have not been picked up defeats the purpose of express service for unanticipated deliveries. Also, better tracking of shipments is achieved through centralized control.

However, we are exploring an early-morning pickup of shipments directly from Federal Express. This would permit delivery of a large portion of shipments by late morning. I should add that the recent merging of JIT Receiving and General Receiving is intended to help speed inbound deliveries. Enhanced customer service will be a continuing focus in Directorate 3700.

Bob Zaeh (3700)

# feed **back**

*Q: I just returned from a visit to Lawrence Livermore National Lab (LLNL), and the contrast between their security system and ours couldn't be much greater. At LLNL you are issued a badge that is read electronically in a booth that does not require closed-circuit TV contact with the guard office, resulting in considerably faster access to the Tech Area. Exit is through a turnstile. The significant reduction in hassle and delay makes the environment more pleasant than ours. LLNL apparently has had this system for a few years. Why are we so far behind?*

A: LLNL's automated access-control system evolved from a project initiated in 1985 known as Controlled Access by Individual Number (CAIN). CAIN is only half of a security systems upgrade; the other half is a connected computer-based alarm system.

At the time, Sandia chose to install only the alarm system upgrade, an extensive modification that is now near completion. Sandia's use of automated access control has been directed toward its most sensitive assets and facilities. As a result, only those employees using this technology are aware that computer-based access control systems have been installed. It is not that we are "so far behind"; rather, we chose to emphasize certain compartments.

Perimeter access control has been facilitated with MARDIX booths. Since these booths are a labor-intensive operation, Sandia is now looking at two different automated access-control systems that lend themselves to perimeter use.

Jim Martin (3400)

*Q: I think there is a potential hazard from all of the E-Z-Go Carts that continually scoot around the Tech Area. The hazard is that the turn-signal switch on the steering column is not me-*

*chanically actuated to automatically cancel itself after a turn has been made. Consequently, many E-Z-Go users drive around the Tech Area oblivious to the fact that the turn signals are still operating. I, for one, have nearly been run over on several occasions by an E-Z-Go cart that continued straight ahead when it was signaling for a turn, while the inattentive driver thought I was the offender, even though pedestrians are supposed to have the right-of-way.*

*With all of Sandia's expertise in electronics, I would think it would be a simple matter to devise a small, simple, time-delay module that could be installed on each of the E-Z-Go carts to automatically shut off the turn signal, say after 15-20 seconds. Purchases of future E-Z-Go carts should require the manufacturer to provide signal-cancelling features, before someone files a lawsuit for being run over by a defective cart.*

A: Thank you for your recommendation. E-Z-Go carts are not manufactured with turn-signal devices; rather, such devices are dealer-installed, off-the-shelf items. It would be cost-prohibitive for the manufacturer to design and offer, as an option, a self-cancelling turn signal for the small number of vehicles sold to the Labs.

However, the Transportation Services Division will look into the possibility of having an inexpensive module designed to automatically cancel turn signals. Meanwhile, cart operators should drive attentively and adhere to the guidelines issued in the Generic SOP "Use of Powered Carts" (GN 470016).

Jim Martin (3400)

*Q: I would like to see the LAB NEWS provide summaries of talks and presentations given at Sandia. The summaries would convey the talk information to many more of us than those attend-*

*ing. I do not attend all of the presentations because I decide not to, I'm not here, etc. The summaries could stimulate me to view videos of the presentations or attend the next presentation.*

A: At one time, the LAB NEWS regularly included reports about talks at the Labs, but the practice was discontinued several years ago based on readership surveys that indicated that very few Sandians actually read these reports. We do continue to cover presentations that are of interest to people throughout the Labs. For example, when Energy Secretary James Watkins spoke here last year, we covered his speech in detail. We often include stories that summarize and explain announcements made during employee meetings, such as the recent story about management restructuring.

Guest speakers have a Sandia host, whose name is printed on bulletins announcing the presentation. If you can't make it to a presentation of interest, you may want to contact that individual for a brief summary or to find out if the presentation was videotaped. Some hosts even prepare written summaries of presentations.

Larry Perrine (3162)

## Take Note

November is Native American Heritage Month. To celebrate, KNME-TV Channel 5 continues airing its special line-up of programs. Shows include "Navajo Country," Friday, Nov. 29, at 11 a.m., a film that explores the simple lifestyle of the traditional Navajo; and "Return of the Sacred Pole," Friday, Nov. 29, at 11:30 a.m., a half-hour documentary that tells of the Omaha Tribe's historic reclaiming of the "sacred pole," a spirit-endowed artifact that had been held for 100 years by the Peabody Museum at Harvard University.

(Continued from Page One)

## School Partners

Victor Weisskopf, an American physicist, said: "Youngsters cannot learn if information is pressed into their brains . . . First, one must create a state of mind that craves knowledge, interest, and wonder. Then we must help children find knowledge by hinting, guiding, evoking questions."

So the Sandia school partners, equipped with rubber bands, skateboards, x-y plotters, and liquid nitrogen, visit local classrooms prepared to drop things, blow things up, or make things change colors so that youngsters may better understand the scientific principles that govern our world.

"The program is a great opportunity to show kids that they, too, can do science and that scientists use the same principles they learn at school to solve interesting and relevant problems," says Lori, who regularly visits science classes at two elementary schools.

### Interaction With Kids Important

Ken says Sandians serving as school partners may commit anywhere from a couple of days per year to one day a week. Many visit classrooms monthly, in accordance with each teacher's curriculum. Sandia foots the bill for time spent in the

### How You Can Get Involved

Sandia's school partners welcome employees interested in participating in the School Partnership Program. Watch for an application/questionnaire to be published in the Nov. 25 *Weekly Bulletin* or contact Shannon Lytle (35) on 5-9767.

classroom during normal working hours, and partners typically volunteer an equal amount of time developing demonstrations and participating in after-school programs.

Training is an important part of the program, says Ken: "New school partners get a chance to observe and assist other partners in the classroom before conducting their own demonstrations. It's important that they see how an experienced school partner interacts with the kids."

In addition, seven of Sandia's classroom activities have been published in script-like format in an accessible booklet, and current school partners have begun testing several more demonstrations for publication.

### Goal Is 100,000 of Us

So far the response has been overwhelmingly positive, says Ken. Questionnaires given to students indicated that their attitudes toward science improved considerably after only a semester in the program. Notes received from students include comments such as: "For the first time I learned some science," and "I really liked that skateboard experiment. It helped me understand that equation ( $F=ma$ )."

Sandia is also collaborating with Engineers for Education, a national organization trying to involve 100,000 scientists and engineers in a grass-roots science education movement in US schools. "Sandia is providing leadership in science education by helping Engineers for Education in developing training materials and by encouraging technical professional societies to initiate science enrichment programs," says Ken.

"This program is an investment in the future," says Lori. "We hope to encourage kids to go to college and pursue careers in the science fields."

•JG

AMERICAN  
CANCER  
SOCIETY

## GREAT AMERICAN SMOKEOUT

The TLC Program is sponsoring this year's Great American Smokeout at Sandia on Thursday, Nov. 21. TLC staffers will hand out "survival kits" from booths to Sandians who take the pledge to quit smoking for the day (and maybe for good!). For more information, contact Arlene Price (3300) on 5-8729. Look for booths on Nov. 21 at the following locations: 7 a.m. to 1 p.m. in the Bldg. 800 lobby, Bldg. 822 lobby, and at the Cafeteria entrance; 7 to 10 a.m. at the Area 4 and Area 5 entrances.

### A Few Quit Tips

- Hide all ashtrays, matches, etc.
- Lay in a supply of sugarless gum, carrot sticks, etc.
- Drink lots of liquids, but pass up coffee and alcohol.
- Tell everyone you're quitting for the day.
- When the urge to smoke hits, take a deep breath, hold it for 10 seconds, and release slowly.
- Exercise to relieve the tension.
- Try the "buddy system" and ask a friend to quit with you.

**Monitoring Environmental Activities at Sandia, ITRI****State's Oversight Group Begins Operations**

The State of New Mexico now has some extra eyes and ears at Sandia.

That's how Mike du Mond of the state's Environment Department describes himself and his colleagues who recently moved into DOE's Kirtland Area Office (KAO). The group is there as a

**"Our purpose really is to increase the public's confidence in the state's oversight of Sandia."**

result of a 1990 agreement between DOE and New Mexico that provides for the state government to monitor environmental activities at DOE facilities.

DOE expects to fund the state with about \$3 million a year to support oversight programs for five years. That sum includes oversight of San-

dia, Los Alamos National Lab, the Waste Isolation Pilot Plant, and the Inhalation Toxicology Research Institute (ITRI).

Besides Mike, who is the group leader and whose specialty is air quality, the state employees consist of John Hostak and Will Moats, who will monitor mixed (chemical and radioactive) wastes; Bill McDonald, who is a groundwater specialist; and secretary Ellen Schumacher.

Each of the environmental specialists will report directly to the appropriate supervisor at the Environment Department in Santa Fe. Besides Sandia, the group has responsibility for oversight of environmental activities at ITRI.

**Increasing Public Confidence**

Mike says, "Our job is to be familiar with the kinds of environmental monitoring methods that are being used and with the data that's reported. That way, the state government and the public

can be more confident about environmental reports that come from Sandia and DOE, knowing that we're here on site and are following what's going on."

Besides reviewing DOE and Sandia activities, the state group can set up its own monitoring activities if it sees a need.

It may also review materials such as permit applications, National Environmental Protection Act (NEPA) documents, annual environmental monitoring reports, and similar documents. "Until now," says Mike, "things like this have been sent to Santa Fe for review, where they were read by people who didn't have day-to-day contact with the activities they described. Now, we'll be more familiar with what's going on and will be in a better position to help the state government give an appropriate response."

Exactly how the state employees will interact with Sandians is still taking shape. Until the group members receive Q clearances, they will have DOE escorts when they enter a Sandia cleared area.

**Still Getting to Know Sandia**

Mike says, "We're finding out what activities are going on and determining where we'll need to spend time. We expect to be working with a number of people at Sandia, because different programs have different points of contact.

"Right now," he continues, "I'm sure there's some wariness on the part of the Sandia people, because they may not feel sure of our goals and intentions. But I believe that as they become familiar with what we do, they'll realize that our purpose really is to increase the public's confidence in the state's oversight of Sandia and other DOE operations."

Sandians who would like to know more about the oversight program may call Gordon Smith, Manager of Environmental Programs Dept. 7720, on 5-8889. ●CS

**Sandia News Briefs****Study Helps Improve Fire Safety In Nuclear Power Plants**

Steve Nowlen of Adverse Environment Safety Assessment Div. 6419 and Vern Nicolette of Thermal and Fluid Engineering Div. 1513 are participating in an international study of the effects of fire in nuclear power plants. As part of the study, real fires are being set inside the containment building of a decommissioned nuclear power plant in Germany.

In monitoring the fires, the researchers are interested in how and where the fire spreads, how heat and smoke behavior relates to emergency evacuation routes, and how fire data correlate with the predictions of computer codes that model nuclear power plant fires. The new information should help researchers validate fire safety models as well as help the Nuclear Regulatory Commission improve fire safety in US nuclear power plants.

Steve will also participate in a December test at the German plant that will test the failure threshold of safety-related electrical equipment. "This is a unique series of tests because nobody has ever monitored a real fire in an actual containment facility that has concrete, piping, and electrical equipment in it," says Steve.

**Labs Instrument Helps Measure Body Fat in Aging Patients**

A neutron generator developed by three Labs researchers — Frank Bacon (7020), John Weinlein (2364), and Mike O'Neal (2564) — is helping researchers at Tufts University measure body fat in patients with unprecedented accuracy. The instrument should help clinical researchers better understand changes in body composition resulting from aging and age-related diseases such as rheumatoid arthritis.

As a patient is passed under the neutron generator, neutrons collide with atoms in the body, and part of the neutrons' kinetic energy is transformed into gamma rays. The gamma rays emitted from the body are then measured and used to create a gamma-ray energy spectrum on a computer monitor. The spectrum's peaks correspond to elements in the body and their concentrations. The amount of carbon is an indicator of how much fat is present, says Frank, because most of the body's carbon is contained in fat molecules.

An entire body scan takes 24 minutes and exposes a patient to a radiation dose equal to about one-third of the dose from a chest X-ray, he says. "Because neutron generators can be designed to identify many elements, they have also been used for in-vivo analysis of calcium, nitrogen, and cadmium," he adds.

**New Award Given to Edward Thomas and David Haaland**

Edward Thomas of Statistics, Computing, and Human Factors Div. 323 and David Haaland of Chemical Instrumentation Research Div. 1821 are the first-ever recipients of the American Statistical Association's (ASA) "Statistics in Chemistry Award."

Their paper, titled "Comparison of Multivariate Calibration Methods for Quantitative Spectral Analysis," was honored for its "unique combination and application of statistical experimental design and computer simulation and for the clear and thorough exposition of the conditions for which multivariate spectroscopic calibration techniques perform best."

The new "Statistics in Chemistry Award" will be given annually. ASA is an international association with approximately 15,000 members.

**Water Jets Could Make Battlefields Safer**

Lawrence "Mike" Ford of Survivability and Security System Studies Div. 9522, along with researchers in Advanced Projects Dept. 9120, has proposed a high-pressure water jet system that could help find and deactivate buried land mines in former battlefields such as those in the Persian Gulf and Falkland Islands. At least one company has expressed an interest in using such a system to clear land mines in Kuwait.

The system consists of a water tank, pump, and sprayer mounted on a lightly armored vehicle. Water pumped through a long pipe extending several feet in front of the vehicle would be forced through nozzles at the end of the pipe, creating a high-pressure water spray. Soft soils, in which mines are commonly buried, would be easily eroded away by the sprays.

Once a mine is exposed, says Mike, higher-pressure jets could cut the mine apart and disrupt its internal mechanisms. Even if a mine were accidentally detonated, the system is designed to be far enough away to protect it and its operator from the explosion. In a combat situation, the vehicle could be radio-controlled by a remote operator. The system may also be useful for deactivating explosives lying on the surface, he adds.

Send potential Sandia News Briefs to LAB NEWS, Div. 3162.

**Congratulations**

To Stephanie and Jeff (1846) Brinker, a daughter, Sonja Charlotte, Sept. 13.

To Rebecca (6601) and Raymond Bennett, a daughter, Patricia Emily, Oct. 8.

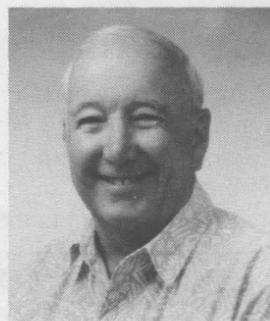
To Martha and Sandy Ballard (6231), a son, Jeffrey Alonzo, Oct. 23.

To Colleen and Milton (2486) Cumiford, a son, Daniel Steven, Oct. 26.

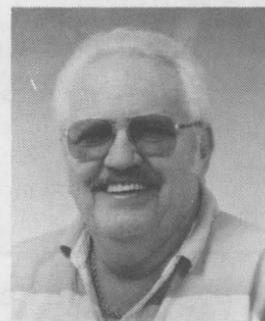
To Doreen Casias (9211) and Mark Johnson, married in Albuquerque, Oct. 26.

To Ami (3552) and Martin (7816) Peterson, a son, Nicholas Adam, Oct. 28.

To Mary (9133) and Ron (9519) Moya, a son, Xavier Andrew, Nov. 4.

**Recent Retirees**

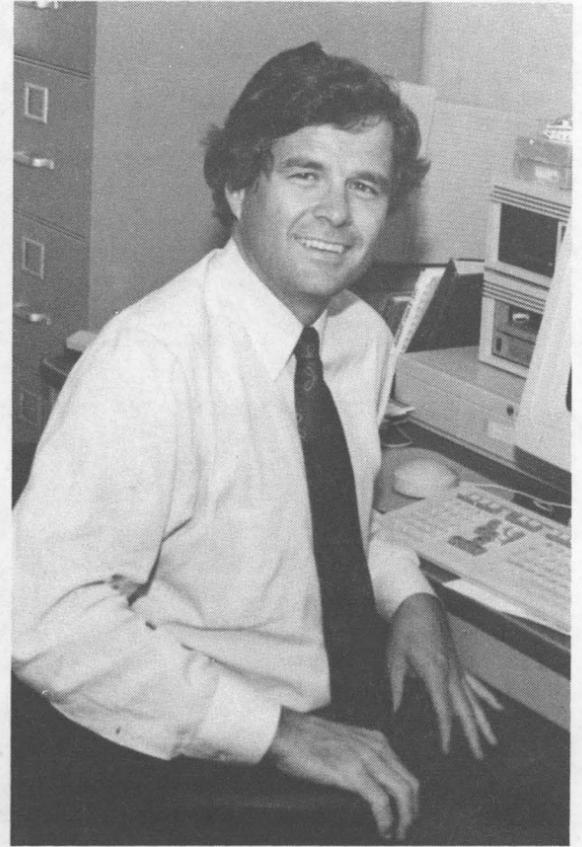
Jim Gallagher  
9143



Jim Hann  
6318

41





**THREE NEW FELLOWS** — Fred Norwood (1542, left) became a fellow of the American Society of Mechanical Engineers (ASME) in August. His appointment recognizes his mathematical modeling of earth penetration, seismic wave propagation in solids, and electrical spark drilling in rock. Del Owyong (1310, center) and Don Sweeney (8351) became fellows of the Optical Society of America (OSA) recently in San Jose, Calif. Del's appointment recognizes his work in non-

linear laser refraction and in gain-guided diode laser arrays and for development of stimulated Raman spectroscopy. Don's appointment recognizes his contributions to 3-D tomography, holographic interferometry, and microwave diffractive optics, and to the theory and practice of digital and optical signal processing. Currently, fewer than 8 percent of OSA's 11,000 members are fellows, and fewer than 1 percent of ASME's 250,000 members are fellows.

*(Continued from Page Three)*

## Ochoa Talks about Space Shuttle Training

aboard a large KC-135, known affectionately as the "vomit comet," which flies in parabolic trajectories to simulate short spans of weightlessness similar to what astronauts must withstand for 11 to 28 days on space missions. Trainees also log several hours aboard a T-38 jet trainer to learn to handle high-performance aircraft like the space shuttle. Ellen took flying lessons to obtain a private pilot's license while working at Sandia, and though this training is not required of all astronauts, she says it has helped her.

Ellen noted some of the specifics of shuttle flights:

- On launch a payload of 25,000 pounds is accelerated into an orbit usually 200 miles above the earth at a speed of approximately 17,000 mph.
- The fuels are liquid hydrogen (at 423 de-

grees F below zero) and liquid oxygen, the oxidizer that enables temperatures in the combustion chamber to reach 6,000 degrees F.

- Shuttle fuel tanks hold a half-million gallons of fuel, and they empty in 8-1/2 minutes — the equivalent of draining an average-sized family swimming pool in 25 seconds.

- Upon reentry into the Earth's atmosphere,

the shuttle decelerates from a speed of 17,000 mph to 200 mph in 30 minutes.

Ellen told the high school students that she plans to take a flute on her shuttle mission and be the first flutist to play in space. (She was in the Livermore-Amador Symphony for two seasons while at Livermore.) Sandians are waiting to cheer her first note. ●BLS

## Take Note

The Armed Forces Communications and Electronics Association will have a luncheon meeting on Thursday, Nov. 21, at the KAFB East Officers Club at 11:30 a.m. Clete Kanavy of Phillips Laboratory will talk about "Biomedical Effects from Nuclear and Microwave Radiation" and how it affects health. He will attempt to dispel myths and unfounded concerns, as well as explain the safety hazards that exist. Lunch is on your own at 11:30, and the talk is at noon. There is no admission charge.

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The 1991 United Way Holiday Blanket Drive will be held from Nov. 29 to Dec. 13 in Albuquerque and Santa Fe. People wanting to donate new or "gently used" blankets can drop them off at any Lovelace Medical Center location in Albuquerque or Santa Fe. United Way will distribute the blankets to several non-profit agencies, who in turn will give them to their clients. For more information, call Clara Quintana on 247-3671.

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Retiring and not shown in LAB NEWS photos: Joe Calek (4500).



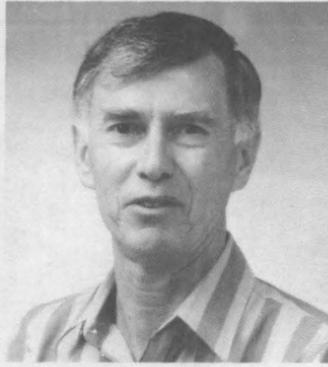
ELLEN OCHOA, one of 22 astronaut candidates who recently completed a year of training and evaluation, becomes familiar with the "feel" of a parachute in the event of an emergency ejection from a jet aircraft. Ellen was formerly an employee at Sandia, Livermore before becoming an astronaut trainee. Candidates learn to use a parachute for a variety of emergency purposes, such as sewing it into a sleeping bag or tearing it into giant strips to be spotted by rescue aircraft. Other kinds of training include withstanding short spans of weightlessness on a simulator, being ejected from a simulated aircraft at three times the force of gravity, logging several hours on high-performance aircraft, scuba diving, and being hoisted from the sea by a Coast Guard helicopter.

(Photo courtesy NASA)

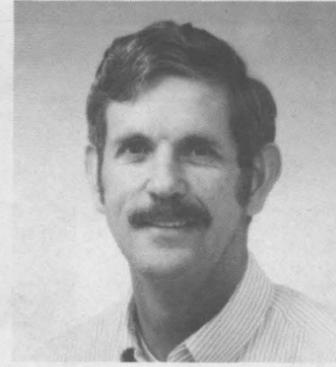
# MILEPOSTS

## LAB NEWS

November 1991



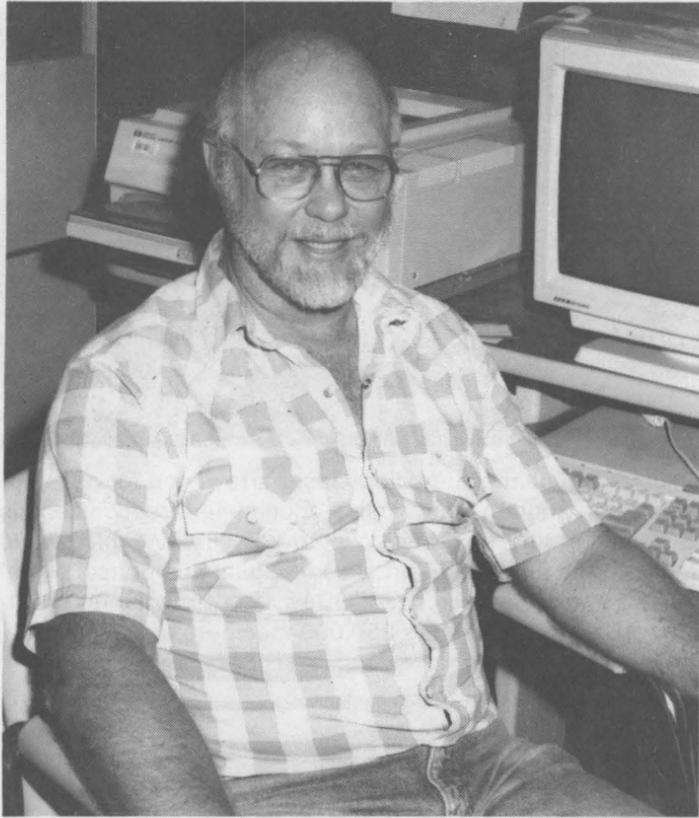
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Terry Ellis  
9231 15



Charles Joerg  
2534 25



Don Shadel  
9331 35



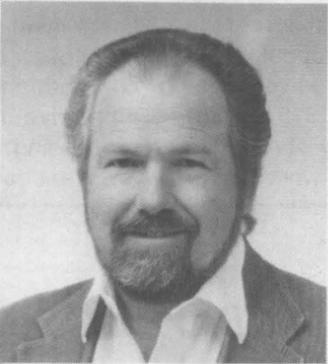
Jack Burt  
2543 35



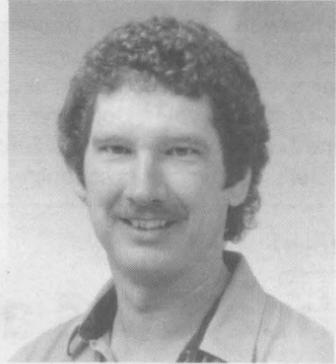
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2334 15



James Young  
3435 20



Archie Gibson  
3128 25



Bob Barton  
3721 15



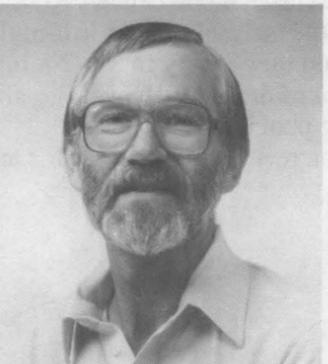
Marguerite Burrell  
6000 35



John Biesterveld  
9513 35



Janet Bauerle  
5127 15



Terry Leighley  
2715 30



Joe Gonzales  
3128 20



Tze Yao Chu  
6422 20



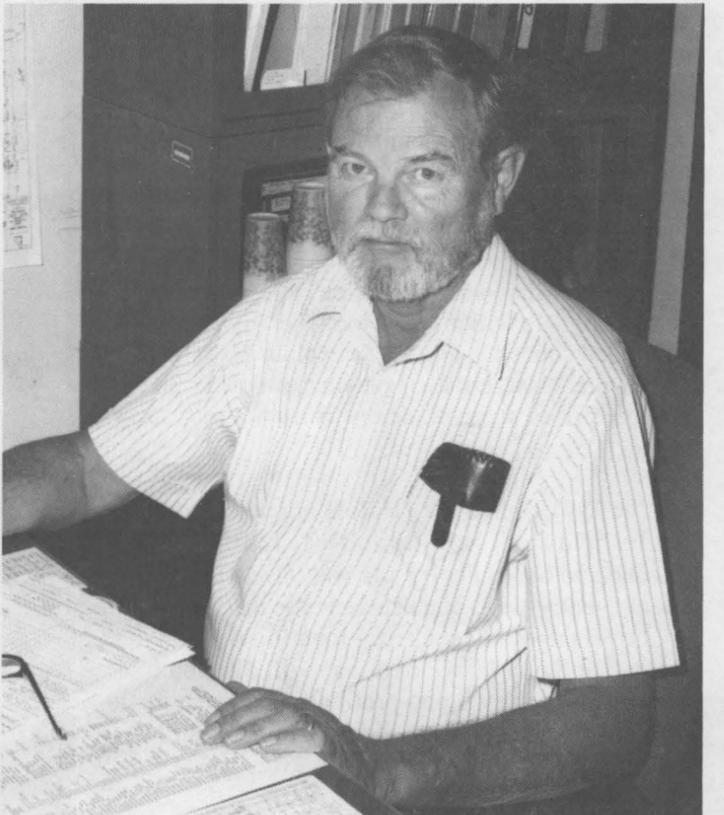
Everet Beckner  
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Darrell Munson  
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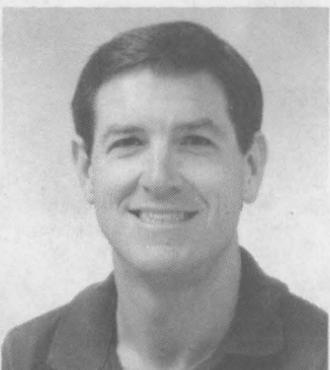
Wil Gauster  
8380 25



Chuck Wimmer  
9331 35



Melvin Johnson  
2735 35



Wendell Jones  
1832 15



C. F. Schroeder  
342 35

## Take Note

The American Society of Mechanical Engineers, New Mexico Section, monthly meeting will be held Thursday, Nov. 21, at Marie Callender's Restaurant (5220 Eubank NE). Social hour begins at 6:30 p.m.; dinner will be served at 7. Technical translator Patricia Newman (5019) will talk about "Ivan's Paradise — Whatever Happened to the Soviet Union?" Cost at the door is \$10/person. If you plan to attend, contact Glenn Rackley (5166) on 4-8897, his secretary Martha Martinez on 4-5786, or Ed Johnson on 842-8911 no later than Tuesday, Nov. 19.

\*\*\*

The annual meeting of the New Mexico Academy of Science, this year called "Explora Science Party," will be held Saturday, Nov. 23,

from 4 to 8 p.m. in Ballroom C of the Albuquerque Convention Center. This year's meeting will be a "science party" featuring Explora science exhibits that teach principles of science to the general public and serve as a preview of New Mexico's upcoming and newest science museum. Also featured will be the winners and their projects from New Mexico's 1991 high school science fair. Harold Daw (NMSU) will present an educational program called "Physics Is Exciting." He is a recipient of the Distinguished Service Citation of the American Association of Physics Teachers and won the Millikan Award for contributions to physics teaching. Admission is \$15 for NMAS members and \$18 for non-members at the door.

The American Lung Association of New Mexico and the UNM Pediatric Pulmonary Center are sponsoring an asthma workshop for asthmatic children and their parents on Saturday, Nov. 16, from 8:30 a.m. to 1:30 p.m. The workshop has separate educational sessions for children ages 6 to 11 years and their parents. The sessions for parents may also accommodate teenagers. For workshop location and more information, contact the American Lung Association of New Mexico on 265-0732.

### Sympathy

To Kathryn Lindell (2484) on the death of her brother in San Jose, Calif., Oct. 22.

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

**Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.**

### Ad Rules

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

### MISCELLANEOUS

COCKER SPANIEL, young male, blonde, free to good home. Pryor, 294-6980.

COLEMAN GAS LANTERN, Coleman 2-burner gas stove. Worden, 881-4486.

DEN SET, early American, solid maple, couch, chair, 2 tables, \$300 OBO. Kassiech, 271-8822.

VACUUM CLEANER, Kirby Tradition, w/attachments, has been in storage for several years, \$125. Sargent, 865-3227.

PHOTO ENLARGER, Omega B-4 B&W, 2-1/4 x 2-1/4 & 35mm negative carriers w/50mm and 90mm lenses, \$100 OBO. Esherick, 299-8393.

BASEBOARD HEATER, H<sub>2</sub>O, \$30; misc. picture frames, \$2/ea.; bassinette & cover, \$40; wood miniblinds, 62-1/2" x 36", \$75/ea. Hall, 294-3448.

REAL-FYRE GAS LOG SET, blower-heater, Model 3429, Century glass door, used 3 times, cost \$959, sell for \$500. Hawley, 299-2516.

WONDER WOOD STOVE, free-standing, w/blower, \$165; Fisher car seat, \$45; Sears water softener, \$100. Cibicki, 877-7098.

TWIN BED, Sealy Posturepedic mattress, w/frame, \$50. Matthewson, 883-6649 after 5 p.m.

TOSHIBA BETA VCR, still works, use for parts, backup, or whatever, \$200 OBO. Lambert, 293-8825.

SATELLITE SYSTEM, 8.5-ft. spun-aluminum dish, high-capacity, \$990 complete. Reynolds, 281-2106.

AMERICAN RIFLEMAN MAGAZINES, bound copies, from '64 to present, free. Mosteller, 256-3227.

DINING ROOM TABLE, walnut, drop-leaf, \$300 OBO; Simmons sofa-sleeper, \$200 OBO; wood sliding cabinet, \$50 OBO. Sherman, 889-9746.

CAROUSEL SLIDE PROJECTOR, Kodak, \$150; bistro table, w/4 chairs, \$125; steel bakery shelves, \$100; paper towel dispensers, \$24. Schultz, 275-9349.

CANON FD LENS, new, 50mm F1.8, w/cap, \$35. Desko, 883-2662.

ROLLBARS, w/KC lights, fits small truck, \$75. Foster, 293-9009.

LOBO BASKETBALL TICKETS, sell as a package, 2 tickets on south side, Nov. 9, 18, 22, 23, 27; Dec. 2, 7; Jan. 3, 16; Feb. 6, 13, \$206 (listed ticket price). Menicucci, 842-6330.

KITCHEN TABLE, green carpet & drapes, gold carpet, black swivel counter stool, 22-in. glass-top table. Schamaun, 298-5192.

PING-PONG TABLE, \$50; DP weight lifting set, \$225. Olbin, 275-2681.

SERVICE MANUAL for '82 Datsun 200SX, \$8; 4 flood lights, car lot type, outdoor pipe-mount, adjustable, \$15/ea. or 2 for \$20. Sanchez, 892-7258.

CROSS-COUNTRY SKIS, wax type, 205 & 195 lengths, \$17/pr.; West-bend Deluxe humidifier, \$25. Geck, 299-5095.

CURTAINS (2 pr.): 54-in. Sears Open Home style, w/valances; insulated set for sliding glass door. Branstetter, 292-5978.

CINNAMON COCKATIEL, hand tamed, 6 mos. old, 2 cages, bedding, food, \$100. Finley, 294-3910.

PORTABLE DOG KENNEL, 30" L x 19" W x 24" H, \$50. Redmond, 899-9744.

BABY CRIB, \$40; bassinet, \$15; playpen, \$5; pinewood kitchen cabinet doors. Ruby, 299-0767.

FULL-SIZE BED, Sealy mattress set, headboard, rails, footboard, \$75. Phipps, 299-3151.

TWO LOBO BASKETBALL TICKETS, UNM vs. Texas Tech, Nov. 27, \$10.50/ea. Odinek, 892-5822.

RESTAURANT CHINA, service for 4, extras, shadowleaf pattern, \$35; Presto Burger, \$3. Matlack, 256-7371.

DESIGNER DRESS, by Diane Frej, size 8-10, \$75; new size-6 pink beaded heels, \$10; matching evening bag, \$10. Sackett, 292-1048.

LAPTOP 286 CLONE, 20MB, 1.44MB floppy, 12Mhz, \$850; CGA monitor; printer; software; microwave oven. Heffelfinger, 281-1733.

SOFA SLEEPER, queen-size, camel back, tan, \$200. Pantuso, 892-3641.

HIDE-A-BED, earth-tone, \$75; 6-1/2-ft. artificial Christmas trees, \$10; 8 metal bi-fold closet doors, 24" x 78", \$7/ea. Riggins, 299-7778.

VGA COMPUTER DISPLAY DRIVER, dual outputs, 256K RAM, \$45; digital video enhancer, color corrector/paintbrush, audio mixer, \$150. Hale, 298-1545.

SANDIA PEAK SKI/TRAM PASS. Kavet, 299-1793.

FITNESS STEPPER and PreCor 612; metal desk; heavy drill press, all negotiable. Senglaub, 281-8002.

ATOMIC-ARC 130 DOWNHILL SKIS, \$25; Trappeur size-4 boots, \$15; poles, \$1. Kerschen, 821-2848.

AT&T 6300 COMPUTER, mono monitor, 640K memory, 20MB hard disk, 2 floppy drives, w/manuals, \$300. Henry, 266-6467.

CHAINS, 31.10.5-16.5LT; .22-cal. automatic rifle, w/scope, Marlin Glanfield, \$25; ski boots, size 10, \$10. Schowers, 822-8494.

SOLID-OAK DINING ROOM SET, 42-in. oval table w/extension, 4 chairs, buffet & hutch, \$450. Kozlowski, 298-4869.

HALF-PRICE EUROPE 1991, coupon book w/50% savings on Europe's finest hotels, restaurants, shops, & tours, \$20. Sprauer, 275-0092.

MINISCRIBE HARD DISK DRIVE, 100MB, PC-compatible, w/RLL interface board, will demo, \$250; VGA card, \$25. Bainbridge, 298-3423.

GAS GRILL, Kenmore, portable, w/LP gas tank, electronic ignition, 2 burners, \$125; 1-gal. electric ice cream freezer, \$15. Brandon, 836-5621.

BUNNIES: Siamese mini-lops (3), \$12/ea.; white male California rabbit, \$12. Salgado, 883-0749.

80287 MATH CO-PROCESSOR CHIP, \$45. Kimberly, 293-5835.

PIONEER SX6000 AM/FM STEREO AMPLIFIER, 100 watts/channel, will run 2 turntables, 6 speakers, 4 tape decks, 2 microphones, \$150. Barnard, 831-4114.

### Deadline Change

The next LAB NEWS will be published Dec. 6. Deadline for ads and other submissions is noon, Tuesday, Nov. 26.

MARLIN RIFLE, .22-mag., Model 782, bolt-action, 4-round clip, 1-1/2 boxes ammo, \$125. Smith, 384-5182.

RADIO-CONTROLLED CAR, Associated RC10, Futaba radio, \$499; VRAM video board, w/512K, 40MB Seagate w/controller, 80287 math coprocessor, \$399. Luther, 293-4462.

REYNOLDS TRUMPET, \$175 OBO; Yamaha clarinet, \$135 OBO. Aragon, 888-3473.

DOUBLE SLIDING DOORS, complete w/frame & hardware, \$40; 2 Windsor dining room chairs, \$40. Gonzales, 344-4933.

IBM COMPUTER, w/2 disk drives, Okidata printer, continuous-feed paper, several new ribbons, \$250 OBO. Poulter, 291-0607.

MINIATURE DACHSHUNDS, AKC-registered, long-haired, champion-sired, champion lines, 2 males, 2 females. Smith, 888-7928.

JVC 100-WATT SURROUND-SOUND RECEIVER, \$325; dual tape deck, music search, auto reverse, \$225; "6+1" CD player, \$225. Herther, 298-4823.

MINIATURE DACHSHUNDS (4), ready for homes Christmas week, AKC-registered, parents on premises, \$200/ea. Simmons, 293-9294.

MARINE RADIO-TELEPHONES (2), new, VHS/FM, 24-channel, still boxed, \$275/ea., \$500/both; wood stove, stovepipe, 20 x 24 x 31, \$300. Alderson, 293-5112.

MICROWAVE OVEN, Frigidaire, 700-watt, digital, \$100; 4 Fostoria Jamestown ice tea tumblers, pink, \$25/ea. Saya, 296-1817.

SPINET PIANO, w/bench, 1943 Story & Clark, hardwood sounding board, walnut finish, \$550. Lysne, 296-5037.

SCOTTS FERTILIZER SPREADER, portable electronic typewriter, canning jars, bookcases, Yamaha guitar w/case, 8-track AM/FM record player/stereo. Mills, 299-2130.

SKIS, Dynastar Course 203cm, w/Tyrolia 490D bindings, recently tuned, \$175. Davis, 294-1048.

SCHILLER UPRIGHT PIANO, mahogany, original ivories, \$450 OBO. Barnard, 256-7772.

GE WASHER & DRYER, old, but still working, \$50/ea. OBO. Hughes, 265-1698.

NIKON EM 35MM CAMERA, 10 yrs. old, \$165. Wrons, 275-0856.

GARAGE SALE: Nov. 23, dinette set, table, 4 chairs, \$110; shoes, clothing; stock rims, 14-in, \$110; Dingo boots, \$25. Polito, 298-3859.

BRUNSWICK POOL TABLE, \$625 OBO. Martinez, 845-0632.

SKIS, Dynastar Omesoft Kevlar, 200cm, new, unmounted, \$145; Lange ZR man's size-7 ski boots, \$50. Summers, 881-7765.

### TRANSPORTATION

'81 CADILLAC ELDORADO, 2-dr. loaded, 8K miles on rebuilt engine, extras, \$2,500. Marquez, 344-8455.

'89 BERETTA GT, loaded, extended warranty, 35K miles, bright red, \$7,500 OBO. Chagnon, 822-8312 after 6 p.m.

'65 BUICK WILDCAT CONVERTIBLE, AT, red, \$3,700 OBO. Lopez, 299-2441.

'78 CHEV. PICKUP, Custom 10 Deluxe, 1/2-ton, radio, heater/AC, \$1,500 OBO. Danella, 891-8059 or 892-2892.

'81 TOYOTA COROLLA SR5, 2-dr., hardtop, 5-spd., 81K miles, \$2,200 OBO. Caldwell, 821-7110.

'82 NISSAN DIESEL PICKUP, long bed, w/camper shell, minor body damage, will consider selling shell separately, \$750. Anderson, 281-5535.

'80 SUZUKI GS1000, 20K miles, fairing, bags, trunk, AM/FM cassette, CB, cruise, 2 helmets, \$1,500. Potter, 869-4716.

'75 PONTIAC GRAND PRIX, 400 V-8, red, original owner, \$1,300. Strall, 821-5280.

'74 JEEP CHEROKEE, 6-cyl., 3-spd., alloy wheels, locking hubs, class II hitch, \$1,750; man's 10-spd. bike, \$35. Jones, 255-4539.

'76 CADILLAC FLEETWOOD BROUGHAM, 4-dr., all power, new tires & exhaust system, tinted windows, \$3,500. Polito, 298-3859.

'83 FORD RANGER PICKUP, w/small camper shell, 4-WD, AC, cruise, 60K miles. Jackson, 275-5703.

'89 SUZUKI MOTORCYCLE, GSXR750, 8,500 miles, garage-kept, w/solo seat, \$4,600 OBO. Stanley, 255-3083.

'85 PONTIAC FIREBIRD LIMITED EDITION, 69K miles, AT, AC, AM/FM cassette, 305 V-8, louvers, yellow, original owner, \$5,200. Accardi, 821-9684.

REGAL BICYCLE, new, 20-in., \$50. Kerschen, 821-2848.

HONDA ENDURO MOTORCYCLE, 175cc, \$195 as is. Stang, 256-7793.

'87 ACURA INTEGRA LS, 47K miles, AC, PS, 5-spd., cruise, AM/FM cassette, alloy wheels, new tires, \$7,400. Kinney, 298-5281.

'85 VOLKSWAGEN GOLF, 4-dr., loaded, 40K miles. Walker, 821-5938.

'89 HONDA PRELUDE Si, 43K miles, one owner, black w/alloy wheels, \$12,400 book value, \$10,600. Keegan, 256-1843.

'85 XT250 DIRT BIKE, completely rebuilt by mechanic owner. Pryor, 294-6980.

'85 CHRYSLER FIFTH AVENUE, new front brakes, AC, PS, PB, PW, \$3,500 OBO. Stichman, 293-6096.

'86 DODGE COLT VAN, 94K miles, PB, PS, AC, tinted windows, \$5,000 OBO. Martinez, 345-0632.

### REAL ESTATE

4-BDR. HOME, 1,920 sq. ft., 1-1/2 baths, single garage, large workshop, fireplace, fenced yard, \$62,500, \$475/mo. Barnard, 831-4114.

4-BDR. HOME, 1-3/4 baths, 2-car garage, assume FHA loan, no qualifying, low down, Taylor Ranch. Lucy, 899-1013.

2-BDR. HOME, North Valley, 1/4-acre, fenced, 28' x 28' garage/shop w/10-ft. walls, 4510 Carlton NW, \$49,250. Bedeaux, 291-0836.

### WANTED

ENCYCLOPAEDIA BRITANNICA, in good condition. Thompson, 281-0924.

SCHWINN AIRDYNE or NordicTrack. Shephard, 298-4879.

CONCRETE MIXER, w/wet mixing capacity of approximately 3-1/4 cu. ft. (drum diameter = 28-in.). Snelling, 294-5751.

WOMAN'S WOOD CANE, prefer ebony or similar hard wood, w/decorative handle. Wagner, 823-9323.

MATERNITY CLOTHES for business wear, to buy or borrow, prefer dresses or jumpers, size 6 or 8. Williams, 897-1807.

HORSE, for recreational English riding & jumping by true animal lover, reasonable. Preston, 821-2100.

EXERCISE BICYCLE, dual-action. Kimberly, 293-5835.

BUNKBEDS or single beds, in good condition. Essenmacher, 865-7066.

TOYOTA LANDCRUISER FJ-40 DOORS, body parts for '81 Jeep CJ-5, hood, fenders, grill, etc. Summers, 881-7765.

### LOST AND FOUND

FOUND: spare tire cover, on Oct. 30, 4:30 p.m., in lot north of "H" Street, identify & claim. Sundberg, 299-4764.

### SHARE-A-RIDE

VANPOOL OPENINGS: McIntosh, Moriarty, Edgewood, room for several riders. Honest, 832-6046.

**Coronado Club Activities****Member Appreciation Night Brings Discount**

THE CLUB APPRECIATES ITS MEMBERS, and it's gonna show it. Tonight, Nov. 15, is "Member Appreciation Night," when your Club card gets you a 10 percent discount on your meal. And what a menu! Roast prime rib of beef, grilled halibut, Cajun style catfish, and filet mignon are the choicest of choices. There'll be drink specials, too. The band "Together" will be on stage with dance music from 7 to 11. Make those reservations now (265-6791).

AUTUMN LEAVES may be gold no longer, but you can get a "Shot of Gold" from the band of that name next Friday, Nov. 22. The band isn't new to Albuquerque, but this will be its first time at the C-Club. These versatile musicians play country and western, Spanish, oldies, and current

sounds. Sample their music while you enjoy a delicious dinner. Reservations recommended.

BOOM BOX for a lucky kid — that's one of the prizes at Kid's Bingo, Sunday, Nov. 24. Bingo starts at 1 p.m. for kids aged 3-12. Come early for the low-cost buffet starting at noon.

Remember the regular big-people bingo, too, every Thursday evening (except Nov. 28). Cards go on sale at 5:30 (a buffet starts at the same time), and early-bird specials begin at 6:45 sharp. "Nite Cap Bingo" starts around 9:30 in the Cantina.

FOOTBALL IN THE CANTINA — Or rather, on the big-screen TV in the Cantina. Monday Night Football continues; see Buffalo at Miami Nov. 18, San Francisco at LA Rams Nov. 25, and

Philadelphia at Houston Dec. 2. Crunch a munchie while you watch the athletes crunch each other!

(PRE)THANKSGIVING BUFFET, Tuesday, Nov. 26, at the regular lunch hour (11 a.m. - 1:30 p.m.) will include traditional turkey dinner, baked ham, and roast beef — show your Club membership card and get 10 percent off. The Club will be open Wednesday, Nov. 27, but will be closed during the Thanksgiving weekend (Nov. 28 through Dec. 1).

PSSST — DON'T TELL just anyone, but tickets to the New Year's Eve Big-Band Bash go on sale Nov. 18. More info later, but you *know* it's gonna be great!

**Events Calendar**

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

Nov. 15-16 — "Mozart & Bruckner," New Mexico Symphony Orchestra presents Franco Gulli on violin; 8:15 p.m., Popejoy Hall, 843-7657.

Nov. 15-17 — Symphony Guild Festival of Trees; 10 a.m.-9 p.m. Fri., 10 a.m.-6 p.m. Sat., 10 a.m.-5 p.m. Sun.; Winrock Shopping Center, free, 883-6132.

Nov. 15-23 — "Transformations," Theatre-in-the-Making presentation of poet Anne Sexton's interpretations of Grimm's fairy tales; 8 p.m. Fri. & Sat., CenterStage (3211 Central NE), 260-0331.

Nov. 15-30 — Diá De Los Muertos Exhibit: altar, Chicano, santero, and faurist art; 8:30 a.m.-5 p.m. Mon.-Sat., South Broadway Cultural Center, 848-1320.

Nov. 15-Jan. 10 — Exhibit, "Abstract Art: A Manifesto of Liberation," presentation of art from the '30s that emphasizes spiritual liberation through color and non-objective form; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. (gallery talk Dec. 3, 5:30 p.m., by Peter Walch, director of the University Art Museum, about the origins and influences of the American Abstract Artists group of the '30s); UNM Jonson Gallery, 277-4967.

Nov. 15-Feb. 9 — Exhibit, "USS New Mexico Battleship," in commemoration of the 50th anniversary of World War II to honor veterans from all branches of the service, sponsored by the Navy League of the United States and the Albuquerque Museum; 9 a.m.-5 p.m. Tues.-Sun.; Albuquerque Museum of Art, History, and Science, 243-7255.

Nov. 16 — Cleveland Middle School Holiday Arts and Crafts Bazaar; 9 a.m.-4 p.m., Cleveland Middle School (6910 Natalie NE), 884-8567 or 881-0050.

Nov. 16-17 — "Home for the Holidays," standard flower show, holiday floral decorating, horticulture examples, educational exhibits, holiday tea room, miniature table settings for doll parties; 1-5 p.m. Sat., 10 a.m.-4 p.m. Sun.; Albuquerque Garden Center (10120 Lomas NE).

Nov. 20 — Jose Molina Bailes Espanoles, Spanish and flamenco dance company in farewell tour from New York; 8 p.m., KiMo Theatre, 764-1700.

Nov. 21 — Hispanic Culture Foundation Quincentennial Lecture Series: "Hispanic Politics in New Mexico," by Edward Lujan and Ed Romero; 7 p.m., South Broadway Cultural Center, 848-1320.

Nov. 21-23 — "The Three Sisters," by Anton Chekov, directed by Susan Pearson-Davis; call for times, Rodey Theatre, 277-4402.

Nov. 21-23 — Associated Students of UNM Annual Christmas Arts & Crafts Show, jewelry, pottery, sculpture, fabric arts; 10 a.m.-6 p.m., UNM Student Union (north of Popejoy Hall), free, 277-6544.

Nov. 21-24 — Indian National Finals Rodeo, American Indian rodeo riders from the US and Canada compete for prize money and the title of World Champion Cowboy, Indian arts & crafts, powwow, ceremonial dance competition, Miss Indian Rodeo Pageant; call for times, Tingley Coliseum, 265-1791.

Nov. 22-24 & 29-Dec. 1 — "The Nutcracker Ballet," New Mexico Symphony Orchestra and the New Mexico Ballet Company present this holiday classic in a full-length ballet; 7:30 p.m., 2 p.m. matinees; Popejoy Hall, 277-3121 or 842-8565.

Nov. 23 — Craft Show, 10 a.m.-3 p.m., 709 Dakota SE (between Louisiana & San Pedro off Zuni), 255-3083.

Nov. 23 — "The Story of Our Lady of Guadalupe Puppet Show," by the Friendship Puppet Theatre; 7 p.m., South Broadway Cultural Center, 848-1320.

Nov. 23-24 — 20th Century Music for Women's Voices, presented by the Albuquerque Women's Choral Ensemble, featuring New Mexico composers; 7:30 p.m. Sat., St. Thomas of Canterbury Episcopal Church (425 University NE); 4 p.m. Sun., Nativity Catholic Church (4th & Alameda Rd. NW).

Nov. 26 — "I Am Zora: the Zora Neale Hurston Story," a reception and Chataqua performance by Linda Piper open a multi-media exhibition about the Eatonville, Fla., writer who chronicled African-American culture; call for time; UNM Art Museum, 277-4001.

Nov. 26-30 — "Jump at the Sun: Zora Neale

Hurston and Her Eatonville Roots," multi-media visual exhibition about the life of a writer and her hometown in Florida, accompanied by Carl Van Vechten's photographs of African-American authors of the Harlem Renaissance; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues.; UNM Art Museum, 277-4001.

Nov. 29-30 — Thanksgiving Celebration, Traditional Indian Dances, performances by various Native American dance groups; call for times, Indian Pueblo Cultural Center, 843-7270.

Nov. 29-30 — New Mexico Enchanted Arts and Crafts Show; call for times, Lujan Building, NM State Fairgrounds, 891-8640.

Nov. 29-30 — KNME Holiday Gallery, exhibition and sale of art from more than 70 cover artists from the Take Five Program Guide, proceeds benefit KNME-TV public television, Fine Arts Gallery, NM State Fairgrounds, free, 277-1227 or 277-8729.

Nov. 30 — Weaving Demonstration, Guatemalan backstrap weaving by Marines Perez; 11 a.m.-3 p.m., free, Maxwell Museum of Anthropology, 277-5963.

Dec. 4-15 — "Burn This," New Mexico Repertory Theatre presentation of a love story by Lanford Wilson about contemporary New Yorkers (adult theme and language); 8 p.m. Tues.-Sat., 2 p.m. Sat. & Sun.; KiMo Theatre, 243-4500.

Dec. 6-21 — "A Christmas Carol," by Charles Dickens, adapted by Richard Jones; 8 p.m. Fri. & Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

**Favorite Old Photo**

MY FATHER, Stephen Thompson, was in Amanty, France, in December 1917 for training as a member of the First Aero Squadron of the US Army Air Service when this picture was taken. The following Feb. 5, he flew as a gunner with a French squadron on a bombing raid to Saarbrücken, Germany. During that raid, he shot down a German Albatros pursuit plane, becoming the first person in a US military service to shoot down an enemy aircraft. On July 18, 1918, the plane in which he was observer (gunner) was attacked by four Fokker D-7s from Richthofen's "Flying Circus." (Richthofen had been killed in April and Hermann Göring was squadron commander.) My father shot down two of the attackers before his own plane went down. The pilot was able to land inside Allied lines before dying of a stomach wound. My father had a bullet in his leg, which he dug out with a pocket knife because of the lack of immediate first aid in the front lines. The bullet is on display at the US Air Force Museum at Wright-Patterson Air Force Base (Dayton, Ohio), along with the uniform he was wearing when he shot down that first plane.

— Bob Thompson (1420)