

It's official: Sandia will produce moly-99 at ACRR

First radiopharmaceutical samples to be generated next year

By John German

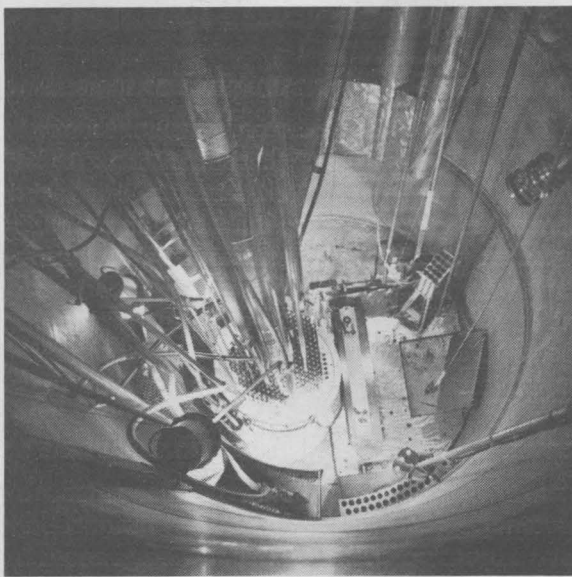
Lab News Staff

Sometime next year, a US hospital likely will use the first batch of medical radioisotopes produced at Sandia to treat or diagnose a patient with cancer.

DOE issued its Record of Decision Sept. 11 to make Sandia the sole US producer of molybdenum-99, one of nuclear medicine's most widely used radioisotopes. The Labs' Annular Core Research Reactor (ACRR) in Area 5, where the moly-99 is to be manufactured, may be called upon to produce other radiopharmaceuticals as well, including iodine-125, iodine-131, and xenon-133.

The decision culminates a two-year selection process that began in September 1994 when DOE announced it intended to consider the ACRR as a potential site for medical radioisotope production. At that time, DOE began studying the ACRR and three alternative facilities — at Oak Ridge National Laboratory, Idaho National Engineering Laboratory, and Los Alamos National Laboratory — as possible production sites, with the ACRR being its "preferred site."

"I am pleased that this important work will be done at Sandia," said US Sen. Pete Domenici (R-N.M.). "Moly-99 is essential to modern med-



The "hot cell" of the ACRR, which will now be used to produce key medical radioisotopes for the US.

icine, and the United States was facing a crisis by relying on foreign sources that were becoming increasingly unreliable."

DOE completed its NEPA (National Environmental Policy Act) assessment, including a full Environmental Impact Statement (EIS) of the ACRR, this May to ensure that planned production operations at Sandia would comply with all applicable environmental regulations.

The announcement naming the ACRR as the selected facility followed a required post-NEPA-assessment public comment period.

The Record of Decision also names Los Alamos National Laboratory to fabricate the special targets necessary for moly-99 production.

Domestic supply critical

In the US, at least 40,000 diagnostic and therapeutic medical procedures each day, and nearly 100 million laboratory tests each year, require the use of medical radioisotopes such as moly-99. The radioisotope has not been produced in the US since 1989, partly because of the complex regulatory environment and costs associated with reactor operations.

Currently, the entire US supply of moly-99 comes from a reactor in Canada operated by Canada's Atomic Energy Commission Limited (AECL), which produces about 90 percent of the world's medically important radioisotopes. The 1950s-era reactor may be nearing the end of its productive life, however, and no backup reactor is yet being built. (There are tentative plans to construct a new Canadian reactor for this purpose.)

Because medical radioisotopes decay rapidly (moly-99 has a half-life of 67 hours), their supply must continually be replenished.

(Continued on page 7)

Insight may improve laptop screens for soldiers and civilians

By Neal Singer

Lab News Staff

Sandia scientists believe they have achieved a fundamental insight into crystalline phosphors that may help industry increase the amount and quality of light emanating from them and lead to the replacement of liquid crystal portable display screens. The Sandia researchers are in Materials and Process Sciences Center 1800 and Physical and Chemical Sciences Center 1100.

The foray into phosphor luminescence should help improve portable computer display screens for future foot soldiers, tank commanders, supersonic airplane pilots, and—through licensing agreements—civilian laptop and portable TV users.

Liquid crystal displays have the annoying and, in critical situations, dangerous tendency to go blank if looked at from angles other than straight on, placed in direct sunlight, subjected to rapid changes in temperature, or accelerated rapidly. In addition, their batteries quickly run down because the entire screen is backlit and then blocked out in sections to provide images.

A phosphor field emission display — traditionally used to create light in most television screens — only energizes pixels that provide information.

Output depends on defect density

The insight came when the Labs scientists tried to understand the mechanism by which a phosphor emits light. They found that the

(Continued on page 5)

Sandia LabNews

Vol. 48, No. 20 September 27, 1996

Sandia National Laboratories



STAR FACILITY WORKERS Clint Hall (9539, left) and Bill Reinhart (1554) install a breech plug in the "Powder Gun" at the STAR facility in preparation for a test. The STAR facility is one of several Sandia test and experimental facilities that have been put on campaign status, meaning they are mothballed most of the time but are available for periodic testing stints, as a result of reduced Laboratories budgets. See story on page 4. (Photo by Mark Poulsen)

US-Russian fuel cell consortium a Sandia dream realized

7

Lockheed Martin E&E Sector scans horizon for opportunities

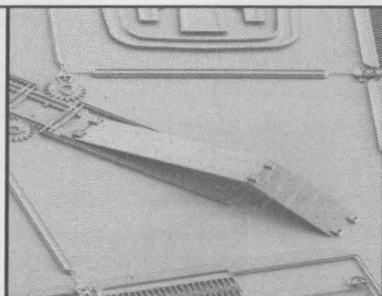
8

9

Computer Support Units create consistent computing

10

Learn to make micromachines in Sandia short course



This & That

Ping-Pong Perrine — In our last issue, our esteemed columnist colleague Larry Perrine used his space here to report that once again he was moving offices — this time back to new Bldg. 811, where most Sandia communicators are located. He said he'd lost count of how many times he'd moved in the past few years. Well, would you believe? Before that column item even got on the presses, Larry was off again, this time on a special temporary corporate assignment in Richland, Wash. It's far enough from Sandia that he didn't think he'd be able to write his column this time. So we'll do what we can in his absence.

Something's different — If something about the look and feel of this issue of the *Lab News* is perplexing you, it means that our printer received the shipment of new paper we will be printed on for the coming fiscal year. As we reported in our Aug. 16 issue, the switch to a lighter-weight, less expensive paper is one of several changes we are implementing in Sandia's continuing cost-cutting efforts. Although we may not look exactly the same, we are not changing our content.

You can relax a little now — You've all heard the laments: "There are now more than 40,000 scientific journals." "Journals are proliferating so fast that no mere human can keep up with the literature even in his or her own field, let alone in related fields." It was enough to give terminal cases of anxiety to any conscientious researcher — which we know all Sandia scientists and engineers are. Well, perhaps you should relax a little. The popular perception that researchers are being overwhelmed by an ever-increasing flood of scientific journals is the "journal myth," according to Eugene Garfield of the Philadelphia-based Institute for Scientific Information. Why? Garfield says the total number of journals out there is both exaggerated and irrelevant. In fact, he says in the Sept. 2 *The Scientist*, "a surprisingly small number of journals generate the majority of both what is cited and what is published." The latest data from SCI's Science Citation Index show that just 100 journals account for nearly a quarter (22 percent) of published articles. 100 journals also account for nearly half (44 percent) of cited articles. And just 50 journals accounted for 33 percent of all references indexed by SCI in 1994. The top five? *Journal of Biological Chemistry*, *Proceedings of the National Academy of Sciences*, *Nature*, *Science*, and the *Journal of the American Chemical Society*. The full list is with Garfield's article, which can be found in Sandia's Technical Library. So slow down and take a breath. You might even have time for a cup of coffee. — Ken Frazier

Around the corporation **LOCKHEED MARTIN**

Hundreds take Oak Ridge Y-12, K-25 retirement incentives

Nearly 440 of Lockheed Martin Energy Systems' (ES) 10,000 employees have accepted an early retirement offer. To reach the required number of job reductions, an additional 300 received layoff notices. ES manages the Oak Ridge Y-12 plant, central to DOE's nuclear weapons program at Oak Ridge, and the K-25 Site, headquarters for DOE's Oak Ridge cleanup program. Lockheed Martin Energy Research Corp., which manages Oak Ridge National Laboratory, has not offered an early retirement incentive, but about 80 jobs are expected to be lost at the lab.

Investor conference highlights strengths, prospects

Members of Lockheed Martin's senior management met last month in Denver with about 75 Wall Street research analysts and large institutional shareholders in the company's first investor conference. Corporate representatives included Vice Chairman and CEO Norm Augustine, President and COO Vance Coffman, Executive Vice President and CFO Marc Bennett, sector presidents, and members of the corporate staff. Presentations focused on building market share in core businesses, expanding into closely related markets, and shedding non-value-added businesses.

Sandia LabNews

Sandia National Laboratories

An Equal Opportunity Employer

Albuquerque, New Mexico 87185-0165
Livermore, California 94550-0969
Tonopah, Nevada • Nevada Test Site • Amarillo, Texas

Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corp., a wholly owned subsidiary of the Lockheed Martin Corp. and a prime contractor to the US Dept. of Energy.

Ken Frazier, Editor505/844-6210
Barry Schrader, California site contact510/294-2447
Lab News fax505/844-0645

Published Fortnightly on Fridays by
Employee Communications Dept. 12640, MS 0165

LOCKHEED MARTIN

Hispanic Heritage change

Due to remodeling in Bldg. 822, the Oct. 8 Hispanic Heritage Month event has been moved. Dr. Daniel Lopez, President of the New Mexico Institute of Mining and Technology, will speak from noon to 1 p.m. in the Coronado Club.

Sympathy

To Linda McLaughlin (6212) on the death of her mother, Gladys Bertelson, in Albuquerque, Sept. 11.

To Nancy Campanozzi (12640) on the death of her father-in-law, Louis Campanozzi, in Huntington Beach, Calif., Sept. 18.

Sandians asked to reduce their energy use by 25 percent

As proclaimed by DOE each year, October is Energy Awareness Month across the complex. This year, under the theme "Clean Energy for a Competitive America," DOE hopes to make significant progress toward its goal of a 20 percent reduction in energy use by 2000. Sandia's own goal, as set by the FY97 Appraisal Agreement with DOE, is a 25 percent reduction in energy use per building square footage.

Combined New Mexico and California Sandia-site usage totals 18 million kilowatt hours per month. Sandia/New Mexico alone uses as much electricity as a town of 25,000 people. Because of new facilities and more energy-demanding programs, overall energy consumption at both sites has risen steadily in the past three years, says Ralph Wrons (7806), Sandia's Energy Program Manager. Energy usage per square foot, however, has gone down over the past 10 years by about 25 percent.

Computer systems consuming more

Plug loads caused by office equipment like copiers, fax machines, and computers are rising. As CPUs get faster and monitors get sharper and more colorful, the amount of electricity they use jumps. A 17-inch SVGA monitor, for example, uses four times as much electricity as the standard-issue monochrome monitor of six years ago. Utilizing power-saving devices such as those promoted by the EPA's Energy Star program that enable machines to "sleep" when not in use can help reduce plug-load drain.

Constant heating, ventilating, and air conditioning demands for each building, which require steam and natural gas energy, also drain resources. But Sandia's combined annual utility bill, about \$14 million, is mostly for electricity.

There are plenty of ways to reduce energy demands, says Ralph, and the easiest of them offer substantial savings. Turning off lights, computers, and copiers when out of the office can cut total usage down significantly.

Until only recently no automated means of controlling lighting, which accounts for 25 percent of a building's use, has been installed in a Sandia facility. Now three buildings — 6585, 870, and some of 887 — have programmable light-switching cabinets, resulting in consistent energy savings in those buildings.

"Typically the work force can have a 20 to 30 percent effect on site energy use," says David Blake, DOE/AL Energy Programs Manager. "Sandia would rather spend a dollar on salary than on energy."

Energy-efficient Bldg. 848

Sandia's own example of effective use of renewable energy can be found in new Bldg. 848, which was designed by Photovoltaics (6219), Solar Thermal (6216), and Geothermal (6111) Research Depts. and Facilities Engineering (7915). The building, which uses a photovoltaic array, a Trombe passive solar heating wall, and a geothermal heat pump, will be open to all Sandians on Monday, Oct. 28, for a tour.

Sandians also consume considerable energy getting to and from work: In their daily commute, about 70 percent of Sandians drive alone. "Consider that about 50 percent of all the oil used in the US is imported, contributing \$50 billion annually to our national trade deficit," says Ralph, "and then consider using an alternative form of transportation — car-pooling, taking the bus, or bicycling — during Energy Awareness Month."

For more information on saving energy, contact Ralph (NM) at 844-0601 or Howard Royer (CA, 8511) at 294-2635.



LEAP campaign kicks off for FY1997

Sandia/California builds on a great record of giving

LEAP chair Johnny Ellison and his employee committee have a tough job this year, but they know it and are working diligently to get the word out on how great the needs are among local charities for Sandians' support this year.



Some 33 local area nonprofit human service agencies plus another 30 Combined Health and United Way groups have shared more than \$150,000 from generous giving during each October's campaign among Sandians in recent years. But with the reduction in number of employees and less than 80 percent of the site population giving last year, Johnny said they are trying very hard to keep the process simple and "user friendly" for those who want to take part in the Livermore Employees Assistance Program (LEAP) this year.

"Sandians have a long history of setting records with their generosity, going back to 1969 with the first Livermore campaign. Employees who do give average more than \$200 each, which is much better than most other big companies in this area," Johnny says. And counting all 26 years the California site has donated approximately \$2.5 million in support of Bay Area United Ways plus numerous local agencies.

This year the LEAP committee took the bold step of eliminating eight groups from the growing number of local agencies on the designated giving list. These were nonprofits that had received less than \$500 from designated

Sandia California News

gifts of employees the last three years, and so to allow for future additions to the list of more popular groups among Sandians, some had to be trimmed. Johnny says beginning next year new agencies will be added at the discretion of the committee when it is determined that they enjoy sufficient support from those who give at this site. "We realized we had added so many groups in recent years the amount received by any one agency was dropping and we were spread too thin," he explains.

"Even though the eight are not on the list of those getting guaranteed allocations, you may still choose to give directly to those groups by indicating it on the pledge card. So if one of the following eight charities is your favorite, you can still direct your pledge to them," Johnny says. Those being cut from the list include: All Seasons Riding Academy, Anthro-



A POPULAR LOCAL AGENCY that benefits from Sandians' giving each year is the Buenas Vidas Youth Ranch, which serves troubled teenagers, providing them with a home and keeping them in school. Shown in front of its Thrift Shop at the corner of Railroad and North L streets in Livermore are from left, LEAP chair Johnny Ellison, Buenas Vidas board member Sally Bystroff, Thrift Shop assistant manager Rosemarie Resendiz, and LEAP committee member Joanne Lombardi.

pos Foundation, Parental Stress Service, Widows/Widowers Network, School Age Mothers, Student Education Loan Fund, Horizons Family Counseling, and Valley Support Services.

Other than that change, the giving program remains the same. Employees will receive their pledge cards from a center or departmental representative who has volunteered to distribute them to their coworkers in the coming week.

Each year the LEAP committee interviews one-third of the agencies on the previous year's recipient list, checking to see how they spend their funds and how well they provide service to their constituency. Every year all agencies must make application for inclusion on the giving list and submit an audited financial report, which is reviewed by an employee subcommittee to be sure they meet the criteria set up by LEAP over the years. Up to eight new agencies applying for support or those recommended by employees will be added next year, based on information they supply and where the greatest need is shown.

Sandians serving on the LEAP evaluation

committee this year include Ray Baldonado, Jim Hogan, Donna Opdahl, Christine Yang, Jim Orsbun, Lois Johnston, Kristy Sibert, Fred Perez, Mary Gould, Dot Harrell, Joanne Lombardi, Ken Nuñez, and vice chair Brian Maxwell. The communication and education committee is headed by chair Tootie Dasher and cochair Ken Nuñez. They are being supported by Tracy Walker who has developed a LEAP information web page. The address is: <http://mel.ran.sandia.gov/leap/>

— Barry Schrader

618 Pints: United Blood Services praises Sandia

Gretchen Cody, Community Relations Representative for United Blood Services, Albuquerque, sent a letter of appreciation on Aug. 12 to Sandia President and Labs Director C. Paul Robinson. The letter, excerpted below, praises Sandia donors.

"At the beginning of the year, United Blood Services set out to build a 'Partnership for Life' that would ensure the availability of blood and blood products for any patient in need.

"This partnership begins with the commitment of organizations like yours who sponsor blood drives. Blood drive coordinators, like Mary de Leon-Maestes [3344], are the next vital link. Their dedication and hard work are what makes blood drives successful.

"The employees, who choose to give of themselves and donate blood, are the final element in the partnership. Your wonderful employees donated 618 pints of blood between Jan. 1 and July 1, 1996.

"On behalf of the patients whose lives depend on blood transfusions, we would like to thank you for helping create a strong and lasting 'Partnership for Life.'

"Through you, we will succeed in making sure that there is an adequate supply of blood in our community."



LEAP-supported agencies

Area agencies selected by the LEAP Committee for continued funding in 1997 include the following: American Indian Center, Awakening, Black Adoption Placement & Research Center, Boy Scouts of Mt. Diablo and SF Bay Area Councils, Buenas Vidas Youth Ranch, Canine Companions for Independence, Child Abuse Prevention Council, Children's Emergency Council of Dublin, Family Crisis Center, Friendship Center, Guide Dogs for the Blind, Hope Hospice, Jobs for Tomorrow, Kaleidoscope Center, and Livermore Association for Guiding & Teaching Students.

Others include Love Thy Neighbor, M-2 Sponsors, Nursery School Scholarship Fund, Project Heritage, St. Mary's Interfaith Dining Room, Tri-Cities Children's Center, Twin Valley Learning Center, and the Valley Humane Society.

In addition, 33 Combined Health Appeal agencies, Tri-Valley Community Fund, and three United Way Agencies (Bay Area, San Joaquin County, Stanislaus County) are recipients. The funds are distributed on a monthly or quarterly basis to the agencies as the employee pledges are collected.

Project helps save essential weapons test facilities

Constrained Sandia budgets for nuclear weapons work since the Cold War's end have helped put some Labs experimental and test facilities on the endangered species list.

Today, however, a handful of these facilities at Sandia/New Mexico — including the Shock Thermodynamic Applied Research (STAR) gun facility and various test facilities in Area III and Coyote Canyon — are being taken off that list thanks to some innovative thinking by a group of Defense Programs veterans and the Labs' Facilities organization.

Jim Asay, former program manager of essential capabilities for the National Security Sector and current Manager of Shock Physics Applications Dept. 9575, says many Labs test and experimental facilities — created so researchers could put nuclear weapon materials, components, and assemblies up against harsh, real-world environments before certifying them for the stockpile — were once essential to Sandia's DP mission.

In recent years, however, with no new nuclear weapons in the R&D pipeline, and with rapidly declining Laboratories budgets, many of those facilities have relied on non-nuclear weapons work for customers other than DOE. In addition, today's computer modeling capabilities increasingly allow simulation of a variety of complex processes, including the testing of some nuclear weapon components. In fact, the purpose of the Accelerated Strategic Computing Initiative (ASCI) is to have computer modeling play a greater role in certifying weapon performance, reliability, and safety in the future.

But, says Jim, Sandia's test and experimental facilities can and do continue to contribute to national security. Several recent projects, including a series of tests performed on the B61 at the Area III vibration facilities and materials data acquired in support of advanced penetration programs at the STAR facility, attest to the facilities' continued usefulness for national security work, he says.

That's why the group last year embarked on a project to preserve Sandia's test and experimental capabilities by reducing the costs required to operate them.

The new approach — developed jointly by Design, Evaluation, and Test Technologies (DETT) Center 9700; Explosives Projects and Diagnostics Dept. 1554; and Facilities Operations and Maintenance Center 7800 — employs a combination of cost-saving techniques that significantly alter the way the facilities are operated:

- DETT facilities are "mothballed," or closed, most of the time but are kept in a state of near-readiness for week- or month-long testing or experimental stints. Facilities Operations and Maintenance Center 7800 developed "mothballed-building rates" to charge the facilities' host organizations for building space during downtimes, thereby reducing annual operating costs for the facilities.

Normally, explains Dave Klassen (7801), a facility in full operation pays into six space-chargeback cost pools representing discrete types of space costs to pay for such services as maintenance and operations, custodial services, and various utilities. Because many of these costs are either limited or nonexistent while a facility is mothballed, the Facilities organization was able to waive all charges for these buildings except for the "administrative" and "general" cost pools, which pay for expenses like fire protection, water, and the space database operations that must be maintained at all times. In addition, host line organizations are billed for actual maintenance activities performed by the Facilities organization.

Not just 'turning off the lights'

"Mothballing isn't just turning off the lights," says John Garcia, Manager of Albuquerque Full-Scale Experimental Complex (AFSEC) Dept. 9761. "Many of these are multi-million-dollar facilities. You have to deal with logistical concerns — maintenance, phones,

security, mail, and custodians, to name a few."

- In addition, DETT facilities are put on campaign status, meaning personnel are redistributed to support test and experimental activities at the facilities on a periodic rather than continuous basis. A maintenance team takes care of routine maintenance and repairs during downtimes. A roving group of core testing specialists ensures that the facilities are maintained safely and that they are ready for scheduled testing and experimental activity. "Campaigners," cross-functional personnel from the DETT center or specialists from other Labs organizations, supplement the core teams during activity periods. By going to a campaign mode, 14 separate test facility operations staffs were consolidated into the equivalent of 2.5 cross-functional teams that are shared among the facilities, says John.

Saving dollars

The combined mothball and campaign approach has allowed fixed operating costs for many of the facilities to be cut significantly.

"STAR facility gun experiment costs are perhaps one-half of what they were a year ago," says Lloyd Bonzon, 1554 Manager. He adds that the success in preserving the STAR facility's capabilities is due in large part to the efforts of Clint Hall (9539) and Bill Reinhart (a contractor in Dept. 1554).

Test and experimental facilities affected by the new approach include the STAR facility; gun operations; rocket sled track; drop towers; aerial cable site; terminal ballistics facility; Area III's shock, vibration, and centrifuge facilities; lightning and electromagnetic environments simulator; anechoic chambers; cable test facility; radiant heat and burn site; and others. The California site is considering mothballing a few facilities, as well.

Each mothballed facility is capable of being operational in less than a week, although "it's more like a few hours or days for most facilities," says Lloyd.

How does the new approach save Sandia money? "The buildings use less electricity and heat and require little maintenance while they are mothballed," says Brian Behling, Manager of Business Administration Dept. 9702. "The mothballing approach allocates space-chargeback costs more equitably. It takes into account the fact that, when mothballed, a building costs less."

And it costs less to staff. "Going to a campaign mode of operation for these facilities is a tremendous source of savings in terms of labor costs," says John.

"This approach has allowed us to maintain the readiness of our capabilities while reducing operating costs significantly and ensuring that experimental and testing costs are competitive with other organizations," adds Pat Chavez, Manager of Capital Facilities and Equipment Program Office 5135.

Jim says the project could not have happened without cooperation among the National Security Sector; Information and Pulsed Power Research and Technology Div. 9000; National Security Programs Div. 5000; Electronics, Materials, and Components Engineering Div. 1000; and Laboratories Services Div. 7000, he says. The contributions of several individuals — including Pat Chavez, John Garcia, Dave Klassen, Brian Behling, and Lloyd Bonzon — were essential to the success of the new approach as well, he adds.

"We all understand that these facilities will never be funded like they were in their heyday," says Lloyd, "but they can be ready almost instantaneously for mission-critical work. We've shown it can work."

— John German

Each mothballed facility is capable of being operational in less than a week.



HISPANIC ROLE MODELS — Dan Arvizu, Director of Advanced Energy Technology Center 6200, and Jim Pacheco, Senior Member of Technical Staff in Solar Thermal Technology Dept. 6216, were named 1996 Hispanic Engineer National Achievement Awards Conference (HENAAC) winners. Dan (at left in this reflected image of the two of them in one of the mirrors at the Solar Tower) received the Executive Excellence Award. He has a BS in mechanical engineering from New Mexico State University and a masters and doctorate in mechanical engineering from Stanford. Jim received the Outstanding Technical Achievement award. He has a BS in mechanical engineering from New Mexico State University and a masters from the University of California at Berkeley. Dan and Jim join five other Sandians in receiving HENAAC awards over the past three years. "The essence of this awards program is to present role models to our nation," said Ray Mellado, HENAAC chairman, in the notification letter to Dan. "Becoming a HENAAC winner is an important step towards helping to increase the number of Hispanics seeking careers in engineering and science."

(Photo by Randy Montoya)

Luminescence

(Continued from page 1)

amount of green light emitted by zinc oxide does not depend upon the thickness of the crystal but upon the density of a defect: oxygen atoms missing from their places in the crystal. Single electrons that remain in the vacant spaces emit green light when a mild electric current is introduced.

"Our work has shown for the first time that the electronic properties at a material's surface have a dominant effect on its luminescent efficiency," says Sandia researcher Bill Warren (1812). "Now we're trying to change the chemistry of the surface to achieve the greatest luminescence."

A special research and development agreement with Motorola's Product Development Department was expected to go into effect this month, brokered by the New Mexico-based, federally funded, nonprofit development corporation AMMPEC. (AMMPEC stands for Advanced Materials and Manufacturing Processes for Economic Competitiveness.) Sandia will help improve phosphors for Motorola's flat panel field emission displays. The work was funded in March for a three-year span by a grant of \$1 million from the Defense Advanced Research Projects Agency.

Aspects of the work have been published this year in *Applied Physics Letters* (Jan. 15) and the *Journal of Applied Physics* (May 15). A third paper was published in the September *Journal of Luminescence*.

Zinc oxide's simple lattice

Zinc oxide — better known in cream form as a sun block and baby's skin soother — was chosen because of its simple, two-component lattice. While most phosphors are composed of three, four, or even five elements in complex lattices, the Sandia scientists believe that development of other phosphors will benefit from the knowledge gained by studying zinc oxide. Other phosphors include those that emit blue and red light, the primary colors that combine with green to form full-color TV or computer images.

"Zinc oxide does not quite have the right chromaticity — it doesn't look naturally green, like green grass," says Sandia scientist David Tallant (1823). "But the color can be balanced. It also can be used in monochrome displays. We used that material to tune up a method to study other phosphors."



BRIGHTER AND BETTER — Carl Seager (1111, seated) operates an apparatus for examining the cathodoluminescence of phosphors as colleagues (from left) Bill Warren (1812), Dave Tallant (1823), and Karel Vanheusden (1812 and UNM) watch.

"Industry is going ahead with phosphor flat panel field emission displays because it believes it can work out the problems. In a few years, it'll build something much better, but it can make flat panel displays work now, and the company that prospers in the long run will be the one that gets a usable product out on the market as soon as possible and continues to improve it," David says.

Previous methods of generating light from phosphors, like those used in most television sets, require large voltage drops across bulky cathode ray tubes to blitz relatively large volumes of phosphor. The voltage required — approximately 25 kilovolts — is incompatible with battery-powered portable units, and the efficiency of light generated by that method declines rapidly when incoming energy drops below 5 kilovolts.

By activating the phosphor surface, Sandia scientists believe they can produce phosphors that operate at 0.5 kilovolt. The scientists now use a few thousand volts to better benchmark efficiencies at lower voltage. Less power can readily be applied because new technology has developed microscopic structures shaped like tiny cones that deliver small amounts of low

voltage current to each red-blue-green pixel on a phosphor screen less than a millimeter away.

"The portable display-building community wants a device that operates at low voltage, a material whose surface dominates its properties, and an understanding of how surface defects that generate light can be used to improve device performance," says David.

"At low voltages, the surface properties of phosphors dominate their light emissions, and surface engineering becomes a key element in improving device performance," says Sandia scientist and University of New Mexico postdoctoral staff member Karel Vanheusden (1812).

"There are huge Department of Defense needs for flat panel displays for aircraft, and field emission displays will outperform liquid crystal displays in a number of applications," says Bill.

Sandia's unique capabilities helped find link

Sandia's unique analytic capabilities were used to obtain a fundamental linkage between luminescence and specific defects or dopants, says Sandia physicist Carl Seager (1111).

The tools include photothermal deflection spectroscopy, unavailable commercially, which measures optical absorption in a powder by measuring the increase in heat of a liquid in contact with the powder. The heat increase causes a change in the liquid's refractivity. That change bends a laser beam passing through it.

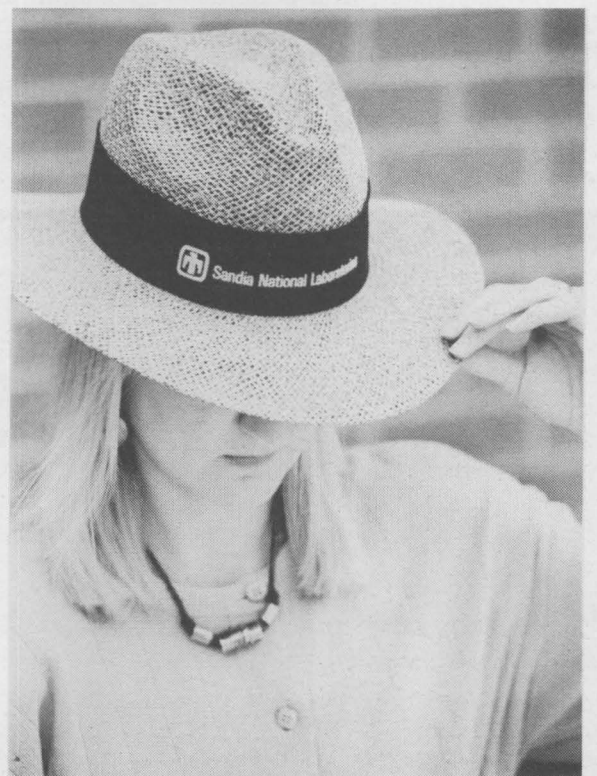
"The beam bending is similar in principle to the bending of light in desert air above hot asphalt, the phenomenon which gives rise to mirages," says Carl.

The amount of bending, when related to the amount of heating, measures changes in temperature to one ten-thousandths of a degree Celsius and can be calibrated to

reveal the amount of light initially absorbed by the phosphor powder. The technique is further refined by measuring the amount of light absorbed at particular wavelengths — "invaluable knowledge in assessing the chemical and electronic properties of these phosphors," says Carl.

While light is usually measured by the amount that passes through materials, so much light is dispersed by powders that accurate absorption measurements are difficult to perform.

Sandia also uses a variety of other spectroscopy techniques, including cathodoluminescence — the observation of light emitted from powders during bombardment by electrons at a variety of voltages — and electron spin resonance, which allows the observation of light-emitting centers in atomic detail.



NEW HAT, NEW SHIRT — The South 14 Village Project has added two new clothing items to its offerings of T-shirts, caps, and coffee mugs, all with the Sandia logo. The hat, modeled here by Kathy Kuhlmann, Employee Communications and Media Relations Dept. 12640, sells for \$15, as does the new golf shirt. Items may be purchased at the *Lab News* office in Bldg. 811, the new building north of Bldg. 800 (outside Tech Area 1). Proceeds from sales help needy families in villages on South Highway 14.



PRODUCTION SITE — Jeff Wemple of Isotope Project and Compliance Initiatives Dept. 9361 peers toward the "hot cell" of the ACRR where targets are placed for irradiation. To make molybdenum-99, sealed target tubes coated on the inside with uranium-235 are placed in the reactor's hot cell and irradiated for several days. (Photography by Randy Montoya)

ACPR to ACRR — a brief history

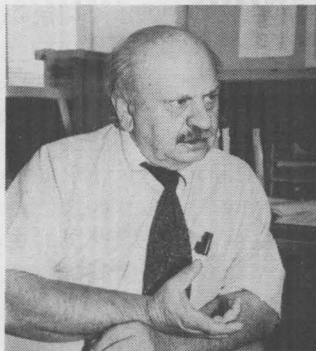
During the remainder of 1996 and into next year, Sandia's Annular Core Research Reactor will be converted to fully support the first large-scale production of molybdenum-99 in the US. (See "It's official: Sandia will produce moly-99 at the ACRR" on page 1.) The program is the latest in a long series of high-profile projects for the reactor.

The ACRR was first constructed at Sandia in 1969 as the Annular Core Pulse Reactor, so named because of its intended role in weapons testing. Different weapons components — such as arming, fuzing, and firing devices — were treated with pulses of gamma radiation or neutrons to determine their ability to survive an atmospheric nuclear blast. Every weapon design in the US nuclear stockpile has been certified

by the ACRR.

In the late 1970s the program's focus changed, and in 1979 the ACPR became the ACRR after some major modifications associated with changing the reactor fuel to a unique high-performance material and design. The reactor was then used to establish safety standards for nuclear reactors through the Nuclear Regulatory Commission reactor safety research program, as well as to continue to provide Defense Programs support with its enhanced performance capacity.

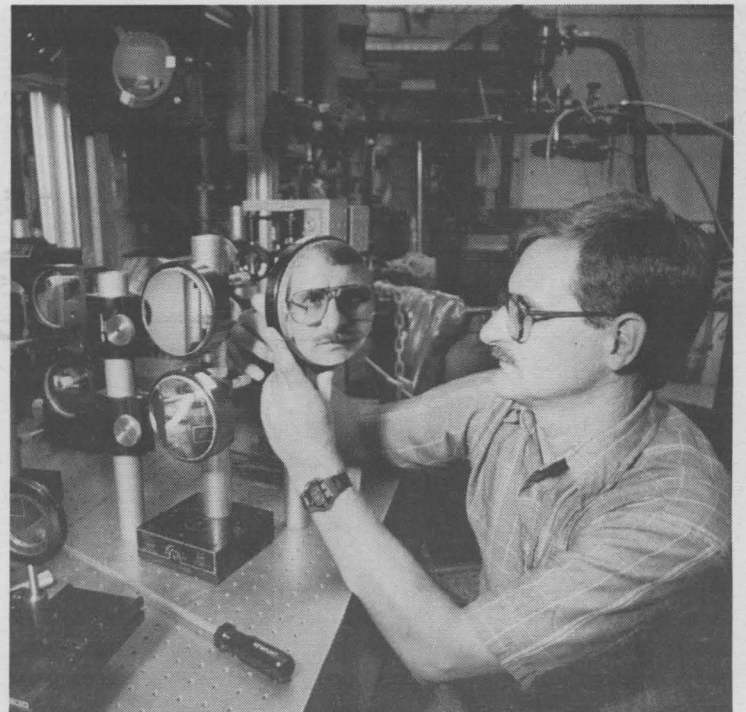
The 1980s and early '90s saw another change in focus, this time to testing nuclear rocket fuels and reactor-driven laser systems. The conversion to moly-99 production will be the reactor's first foray into radiopharmaceuticals.



DICK COATS



DOUBLE-CHECK — Dennis Nelson of Nuclear Facilities and Diagnostics Dept. 9362 checks the X-rayed fuel element of the fuel rod in his hand for problems. There has never been any evidence of fuel rod failure in the ACRR's history.



The ACRR has served myriad purposes in its history; one of the most recently completed was the Fission Activated Laser Concepts (FALCON) program, finished in September 1995. Here Bob Michie, contractor with Nuclear Technology and Research Dept. 9363, adjusts the optics for the Volume Scaling Experiment, FALCON's last project.

Fuel cell consortium realizes dream started at Sandia

Will stimulate US-Russian research and development

When the United States and Russia formally entered into a joint fuel cell research and development consortium on Sept. 17, it was the realization of a concept first proposed by two Sandians.

Secretary of Energy Hazel O'Leary and Russian Minister of Atomic Energy Viktor Mikhailov met in Vienna, Austria, and signed the international agreement to implement the Russian/American Fuel Cell Consortium (RAFCO). They also issued a joint statement announcing the initial cooperative technical projects under the consortium.

Both the United States and Russia have significant research programs in fuel cells, which take energy released by catalytic oxidation of fuel and convert it directly into energy. With high energy efficiency and nearly zero emissions, fuel cells are attractive for remote power needs.

Current plans call for Sandia and DOE's Albuquerque Operations Office to administer RAFCO. Other DOE national labs also will work with the consortium. Three of the labs — Sandia, Los Alamos, and Argonne — already are participating in identified RAFCO projects.

Al Sylwester, Manager of Applied Energy Technology Integration Dept. 6203, says Sandia can call upon its extensive experience and existing infrastructure for contracting with institutes in Russia and other countries in the former Soviet Union. This infrastructure was established to support Sandia's Cooperative Measures Programs with nations all over the world.

Two Sandians proposed it in 1994

Al and Bob Baker, who has since retired from what is now Cooperative Measures Program Office Dept. 5331, first proposed the fuel cell consortium concept at the May 1994 Third Entrepreneurial Workshop, sponsored by DOE and the US Arms Control and Disarmament Agency. At that workshop, conducted at Sandia/California, participants identified the need for cooperative fuel cell research and development between the two countries. Al says

American industry participants in the workshop initiated several ongoing cooperative efforts with Russian scientific institutes.

A subsequent three-day workshop hosted by Sandia in Albuquerque in September 1995 brought together nearly 80 people from the two countries. They included representatives from the Russian Ministry of Science, the Russian Academy of Science, the Russian nuclear institutes, the US State Department, DOE, national laboratories, and American universities.

"At this second workshop, the participants identified the status of fuel cell technologies in both countries, common research needs, and emerging markets," Al says. "In Russia, for example, fuel cell technology is a national priority as a power source for oil and gas exploration activities."

Out of the Albuquerque workshop came a letter of intent that identified the main goals of the consortium. The Russian Ministry of Atomic Energy (MINATOM) committed to provide initial financial support provided that it would be matched by US entities. Sandia agreed to lead continuing efforts to establish RAFCO with a budget to do collaborative research.

Sandians from several centers participated in organizing and implementing RAFCO. These organizations include Advanced Energy Technology Center 6200, International Security Programs Center 5300, Materials and Process Sciences Center 1800, Corporate Planning and Strategic Business Development Center 4500, and Technology Partnerships and Commercialization Center 4200.

Initial projects planned

Al says RAFCO will help focus the expertise in both countries toward accelerating development of fuel cells for emerging markets while promoting nonproliferation goals. Cooperative projects will team scientists and engineers at the Russian nuclear institutes, DOE national laboratories, and US industry.

Gail Ryba of Fuel Science Dept. 6211

reports that the initial set of cooperative technical programs will include projects on:

- Development of high-temperature sealants for solid oxide fuel cells
- Improved bipolar plate materials for molten carbonate fuel cells
- Development of pore-free separator plates for phosphoric acid fuel cells
- Design and development of advanced catalysts, electrodes, and membranes for polymer electrolyte membrane fuel cells
- Processing and characterization of nano-structured zirconia for solid oxide fuel cells
- Preparation of a Russian/English and English/Russian technical glossary on fuel cells
- Advanced materials and catalysts for conversion of hydrocarbons to hydrogen.

Funding for these projects will be provided through MINATOM and through the DOE Initiative for Proliferation Prevention, the US Industry Coalition, the DOE Office of Transportation Technologies, and the DOE Office of Fossil Energy. These efforts also will be leveraged by financial support from the Electric Power Research Institute (EPRI) and the International Science and Technology Centers (ISTC).

— Ace Etheridge

Congratulations

To Cynthia Ozburn and Mark Meindl (2526), married in Albuquerque, Aug. 24.

To Lisa Garcia (7513) and Bill Larkin (7524), married in Albuquerque, Aug. 31.

To Lynn (10231) and Rod Starkweather, a daughter, Madeline Victoria, Sept. 7.

Welcome

California — Arnold Baker (6217)

Florida — Kevin Green (9403)

Moly-99

(Continued from page 1)

(See "Radioactive isotopes for medicine" on this page.) US radiopharmaceutical companies contend that a two-week interruption in production would bring most US nuclear medicine to a standstill. In 1990, Congress requested that DOE develop a reliable domestic source of moly-99.

Sandia's ACRR was selected for several reasons, says Dick Coats (9360), medical radioisotopes program manager, including the Labs' 30 years of experience designing and operating nuclear reactors and its ability to operate the reactor continuously. (See "ACPR to ACRR — a brief history" and photo spread on preceding page.)

ACRR conversion underway

To make moly-99, the targets — sealed stainless steel tubes coated on the inside with uranium-235 — will be placed in the reactor, where each will be irradiated for several days. As many as 37 targets can be placed in the reactor at one time. A few targets will be added and removed each day.

After a cooling period, each target will be loaded into a cask and transported to Sandia's Hot Cell Facility. The target will be opened inside a containment area, gases bled off, and an acid solution added to dissolve uranium and

other fission products. For each target, as much as 800 curies of moly-99 will be precipitated from solution.

After purification, the moly-99 will be shipped by commercial aircraft to medical suppliers. Small quantities of unwanted fission byproducts will be solidified in concrete to prevent leaching. The concrete will be placed in drums for disposal at the Nevada Test Site.

Modifications to the ACRR for radioisotope production will include removal of a tube in the center of the reactor now used for dry irradiation space and addition of a grid for irradiating targets. The first moly-99 samples produced

at Sandia are scheduled to be delivered early next year to the Food and Drug Administration (FDA) for testing. The Labs hopes to begin shipping quantities of FDA-approved moly-99 to pharmaceutical companies by late next year.

Radioisotopes produced in the ACRR will be sold by DOE to suppliers at prices comparable to market prices. Initially, revenues received by DOE will only partially offset the cost of production. Later, however, any profits gleaned from improved efficiency or market growth will go directly to the US Treasury. Production eventually could be transferred to private industry.

Radioactive isotopes for medicine

Medical radioisotopes are unstable chemical elements that decay rapidly to relatively stable forms by emitting radiation. Their relatively short lifetimes make them useful for treating and diagnosing patients while minimizing their radiation doses.

The primary medical radioisotope that will be produced at Sandia is molybdenum⁹⁹. Moly-99 is the precursor, or "parent," of technetium-99m, one of nuclear medicine's most widely used radioisotopes. Hospitals typically receive quantities of moly-99, which decays in a matter of days to become technetium

(moly-99 has a half-life of 67 hours).

Because technetium emits a unique and easily detectable form of radiation, hospitals use specially designed dyes and other technetium-containing substances (injected or ingested into a patient's bloodstream or tissues) to create images of internal organs or other areas of the body. Technetium-99's six-hour half-life means it disappears rapidly from a patient's body.

Radioisotopes also are commonly used for detection and minimally invasive treatment of cancer and other diseases.

Lockheed Martin E&E Sector scans horizon for new business opportunities

Sector must 'build on strengths,' seek global opportunities, VP Joel Weiss says

By Bill Murphy

Lab News Staff

Now that it has a year under its belt, during which it had to invent itself from the ground up, the Lockheed Martin Energy and Environment Sector is positioned to develop and pursue a sustaining business strategy, says Sector VP for Business Development Joel Weiss.

"During our first year," Weiss says, "a lot of our efforts were spent with things we inherited, both opportunities and problems, so this is the year I look forward to really developing a strategy and moving out."

Weiss, who spent two years as Director of Sandia's Strategic and Operational Planning Center 4500, says Lockheed Martin's decision to create the Albuquerque-based Sector is a recognition of the importance of the corporation's relationship with DOE and of the potential business opportunities in the energy and environment fields. And, Weiss says, the opportunities abound.

Right now, Weiss points out, the Sector derives most of its revenue from management of DOE sites. "I'm not sure everyone [at Sandia and around the Sector] realize the extent of what we currently manage — we have Sandia, of course, Oak Ridge [National Laboratory], Idaho [National Engineering Laboratory], Pinellas, a piece of Nevada [Test Site], a piece of [the] Hanford [Site]. When you take all that, it turns out to be on the order of 30 percent of what DOE calls M&O [management and operations] dollars — that's an enormous amount for one contractor to hold." The Sector may be approaching saturation in terms of new business opportunities as a DOE M&O contractor, Weiss says.

What's a Sector to do?

"If I look at other DOE facilities that potentially will go up for M&O bids over the next five years, they're so few and far between that we couldn't grow more than a few percent even if we won every contract we bid on."

With no real growth opportunities apparent in the DOE M&O business, then, what's a Sector to do?

"We have to ask ourselves," Weiss says, "are we going to stay like this, that is, essentially accept stagnation, or is there a growth strategy we can pursue?" It is a question that hardly needs to be asked; clearly, the Sector will seek new areas for growth.

Although the DOE M&O business may be nearing saturation, that doesn't mean there aren't new opportunities with DOE. In fact, one of the department's major cost-saving initiatives in the years ahead will be built around the privatization of its Cold War-legacy cleanup effort. Weiss says the Sector will very likely be aggressive in its pursuit of those privatized cleanup contracts.

Indeed, the Sector already has one key contract, the INEL Pit 9 Demonstration Project. The project is DOE's first major privatization effort, Weiss says, and "it's a learning experience for both of us as to what's the right way to do privatization." That experience, Weiss says, will serve the Sector well as it bids on other privatization contracts.

"We're currently bidding on two other privatization contracts," Weiss says. "One is at the

New VPs round out sector management team

The Nov. 10, 1995, Lab News published brief biographies of the Lockheed Martin Energy and Environment Sector VPs. Since then, four new VPs have joined the Sector:

Kenneth Olsen is Vice President of Washington Operations. He is responsible for representing the Sector before offices and agencies of government customers and other vital Washington institutions. Olsen first joined the corporation in 1988, after working for ten years at the National Renewable Energy Laboratory, including six years as deputy director for the solar research division. He has also served with the EPA and various DoD private Sector contractors.

Barbara Vlashart is Vice President of Human Resources for the Sector. She began working with Lockheed Martin's Skunk Works Human Resources Department, and since then has held such positions as Affirmative Action Supervisor, Personnel Representative, and Labor Relations Representative. In 1991 she was appointed Director of Human Resources at the Skunk Works and in 1994 as VP of Human Resources.

James Goltz is the new Vice President of Finance. His duties include managing all finance and accounting functions of the Sector. Before coming to the Sector, Goltz was the Chief Financial Officer for Environmental Systems and Technologies, Inc. He has also served with Lockheed Sanders, Inc., as the Manager of Financial Planning.

Everet Beckner is Vice President for Technical Operations and ES&H for the Sector. Everet previously worked for five years with DOE, both as Principal Deputy Assistant Secretary for Defense Programs and as science advisor to then-DOE Secretary Adm. James Watkins. From 1973 to 1991, Beckner was at Sandia, serving as VP for Defense Programs, VP for Energy Programs, Director of Energy Programs, Director of Waste Management Programs, and Director of Physical Research.

Hanford site. We hold a piece of the M&O [contract there]; now we're bidding on a privatization contract to vitrify radioactive wastes. In Idaho [INEL], we're bidding on a privatization contract to treat above-ground transuranic wastes; it's called the Advanced Mixed Waste Treatment Project."

While a key piece of the Sector's focus will be on privatized cleanup contracts, Weiss says, "we're looking very seriously at what else is on horizon that we can expand into." For example, he notes, the United States Enrichment Corporation is subject to legislation that will probably take it private some time next year. Weiss says Lockheed Martin, currently the operating contractor of USEC, is talking with other companies about establishing a consortium to acquire USEC. "As the operating contractor right now, we obviously have a lot of experience [with USEC]; we're trying to evaluate what kind of business deal it would be for us if we took an ownership position."

Building on strengths

Given the Sector's experience as a DOE M&O contractor, Weiss says, it is logical that it should "build on [its] strengths" by seeking new opportunities with DOE and other fissile material-related operations (i.e. USEC). But the opportunity horizon, Weiss says, stretches far beyond DOE.

Other opportunities? Says Weiss: "We're looking right now at transferring some technology from our San Diego-based Advanced Development Operations Center, a technology laboratory. That particular lab has a group that came to us by way of [our acquisition of] General Dynamics Space, and these folks are among the country's leading superconducting magnet developers. They've been working in concert with Bechtel and Siemens on superconducting magnetic energy storage. This is a



technology that is being looked upon as a transmission-line-stabilization technology for the utility industry. It's a niche product, but it could be a very substantial niche. That's just an example of the kind of opportunity we're looking at."

Its quest to explore the farthest horizons is bringing the Sector into new opportunities in Eastern Europe and the rest of the developed and developing world. "The global market is where a company this size has to look," Weiss says.

Tip of the iceberg

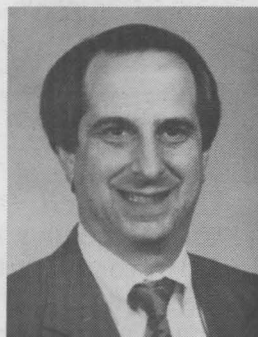
"We are seeing just the tip of the iceberg," he says. "We're just beginning to learn about the scope of the opportunity for environmental cleanup in Eastern Europe in the post-Soviet era. There's a lot there that has to be cleaned up."

"The bottom line is: the rest of the world — and it's not just the Eastern European states — has been somewhat behind us in their recognition of environmental concerns. Much of the rest of the first and second world is realizing that environmental restoration is not a luxury, it's a necessity. This is in the best interest of humankind."

Weiss says the E&E Sector is a vital part of the Lockheed Martin Corporation, bringing valuable assets, high return on investment, and useful diversity to the corporation.

"We are not an aerospace company any more," Weiss says. "Aerospace is one part of our business. We are a technology company." That distinction, he says, is embraced at the highest levels of the corporation.

"The point is, with relationships that range from an alliance with SEGA to make game chips all the way through traditional work for the Department of Defense, we are a very much broader corporation than we used to be, so that something like [the] Energy and Environment [Sector], which at one time might have been considered [at the corporate level] as 'non-core,' is now recognized as a valuable technology area for the corporation to be involved in."



JOEL WEISS

The next issue of the Lab News will feature a story about the Lockheed Martin E&E Sector's efforts to create a "system of labs."

Computer Support Units think globally, act locally

Customers like the CSUs' deep bench

The initials are the same, but the name has changed. The former Customer Service Units (CSUs) are now Computer Support Units.

"Both names really apply," says Rick Harris, Manager of CSU Operations and Development Dept. 4423. "'Customer service' expresses our attitude and ideal. But 'computer support' is a clearer description of our business, of what we provide to Sandia."

CSUs were formed in 1994 as a way to help create consistent computing capabilities across the Labs, explains Mike Eaton (4010), who as Chief Information Officer has the job of leading Sandia's Integrated Information Services. "That especially means being able to share information with other Sandians and to interact with corporate information," he says. "Our goal for Sandia information is that it's entered once and then shared often."

The 11 CSUs — 10 in New Mexico and one in California — are usually named for the building where they're based, such as CSU 802 or CSU 821. Each serves several other buildings in its vicinity.

Customers double in FY96

In a rapid expansion that makes them seem like an adolescent in a growth spurt, CSUs have almost doubled their customer count this year. The number of subscribers is now about 5,800. By the end of fiscal 1997, subscribers are expected to increase to 8,000. Most subscribers choose "comprehensive" service, which includes troubleshooting whenever needed, installation of standard computer software, setup of new computers when they're acquired, and similar services.

CSU staff also manage local area networks (LANs), run the corporate e-mail post offices, maintain file servers and web servers, and do related jobs that make up the contemporary cyberscape. A CSU team develops procedures to make sure new software can be reliably distributed and installed on thousands of Sandia computers.

"The CSUs are the first link in the chain between each Sandian and our enterprise information system," says Herb Pitts, Director of Information Services Center 4400.

Many Sandia organizations, of course, need scientific or engineering computing support. Since the CSUs' job is primarily to ensure corporate information sharing via a common collaborative environment, meeting such customers' needs requires that scientific or engineering computing be included in CSU services. The result might be a LAN that combines PCs and Unix machines, or a classified network and its associated security plan. "By offering such services," says J.C. Kelly (4434), Project Manager of CSU 891, "we pro-

vide a complete solution."

In addition, says Rick Harris, the CSUs make sure "local solutions" mesh with Sandia's overall information needs and directions.

"When we were first setting up the CSUs," he says, "we found ourselves constantly using phrases like 'local computer support with a Labs-wide perspective.' That really describes what we offer. Our CSU staff people and the project managers who lead each CSU are fiercely loyal to their local customers.

"But they aren't blindly loyal," Rick says. "They make

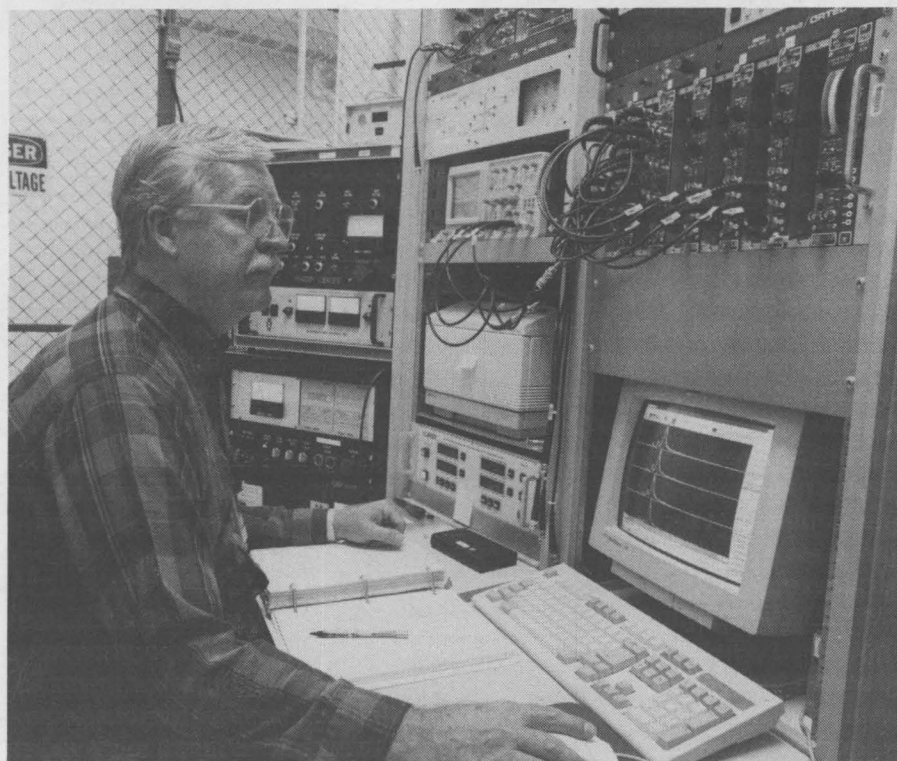
sure the right choices are made to keep customers' systems compatible. The CSUs bring distributed computing standards to Sandia — not in a confining way, but in the sense of standards that liberate all of us to exchange information with one another."

A large part of the benefit for customers is the freedom to stop worrying about computers and concentrate on their own primary work. "It minimizes the amount of time my design staff have to spend keeping their PCs and software up and running," says Jim Wilder, Manager of Firing Set and Mechanical Design Dept. 2674. "That's a major point."

Cost savings

Another customer, Larry Dalton, Manager of Command and Control Software Dept. 2615, can point to cost savings. Before becoming a CSU customer, he identified as much as possible of the actual cost of maintaining his organization's computers and LAN. For FY95, he says, those costs came to a quarter of a million dollars for a department of 25 to 30 people. As a CSU customer, he has had considerably smaller costs, partly because of a system that lets each person work both in a Unix environment and a Windows environment from a single computer. Previously, most of the department staff had to have two computers.

Larry is also pleased that he no longer has to worry about who's taking care of the computers when a support person is ill or on vacation. "If



JIM BANKS (1111) works in the Heavy Ion Backscattering Photometry lab, collecting data with a computer maintained by Computer Support Unit 897.

our computer support was a basketball team," he says, "I'd say the CSU gives us a deep bench."

Much as CSU staff and project managers enjoy compliments, they keep their ears tuned for hints of things gone awry. "A good relationship with a customer doesn't mean the customer never complains," says Tom Klitsner (4423), Project Manager for CSU 821. "It means the customer complains in a timely way and gives feedback that lets us correct trouble."

CSU customers agree. "If you decide to invest money in CSU services, I think you also have to invest effort into making it a relationship and working with the CSU so they understand your requirements," says Lorraine Sena-Rondeau, Manager of Information Systems and Documentation Dept. 14307.

"We've had some issues," says Lorraine, "such as not always getting the services we anticipated, or not having it in the time frame we expect. Those are the kinds of service issues we're working with the CSU."

Gary Beeler, VP of Defense Programs Products & Services Division Div. 14000, says, "There's room for improvement. But from what I've heard, the attitude of the people providing CSU support is very supportive in wanting to make improvements. So I think we'll get there."

Says Jim Wilder, "Our service has been good. I've been very, very pleased. Is it perfect? No. There isn't any service in this company which is perfect. For that matter" — referring to the business of his own organization — "there isn't any engineering design group which is perfect!"

Jim also applauds CSUs' efforts to respond to customer complaints. "If something isn't working right, I let them know," he says. "But they have also been very proactive about wanting feedback. 'What isn't right? Tell us?' After we tell them, they go out and try to fix it."

Help Desk is entry to CSU services

Computer Support Unit subscriber or not, anyone at Sandia (including on-site contractors) can call or e-mail the Corporate Computing Help Desk to get information, report a problem, request help in leasing a new computer, or ask other computer-related questions. The Help Desk phone is 845-CCHD (845-2243). E-mail is cchd@sandia.gov.

Needs that can't be handled immediately by a Help Desk analyst are referred to a CSU via a computerized message known as an "action request." If the caller is a member of a subscribing organization, the CSU takes

care of the need. If the caller isn't a subscriber, a CSU representative explains options for getting aid, which can include help from CSU staff paid for at an hourly rate.

"We've been upgrading Help Desk procedures and the link between the Help Desk and CSU," says Jim Hamilton, Manager of Computing Help Desk & Passwords Dept. 4412. "In the past, some callers have experienced delays in getting answers, and we're working together to make sure we always give the prompt, excellent service our customers deserve."

Recent Patents

Richard Anderson (8815), Ann Campbell, and Edward Cole (both 1275): Magnetic Force Microscopy Method and Apparatus to Detect and Image Currents in Integrated Circuits.

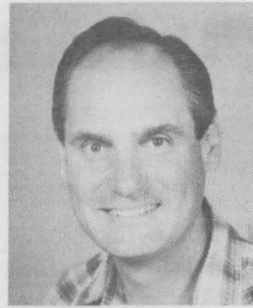
Pang Chen (9223) and Yong Hwang (leave of absence): Method and Apparatus for Planning Motions of Robot Manipulations.

Mileposts

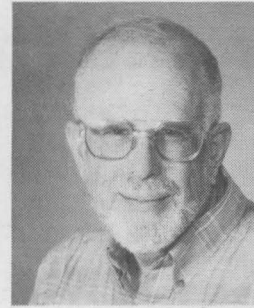
September 1996



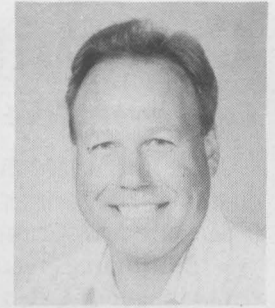
Ed McKelvey
35 8120



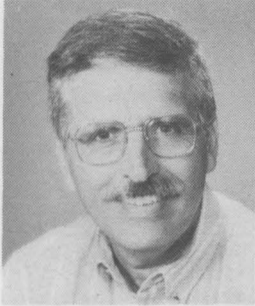
Keith Kuhlengel
15 8120



Jim Lathrop
30 8743



Bob Franssen
15 2265



Walt Ghio
30 2263



Ken Hicken
25 8240



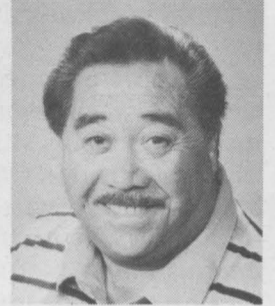
John Wirdzek
15 8361



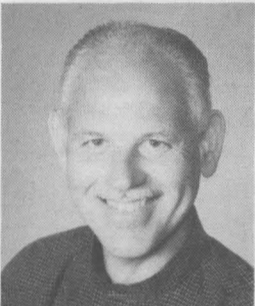
George Rafal
30 8513



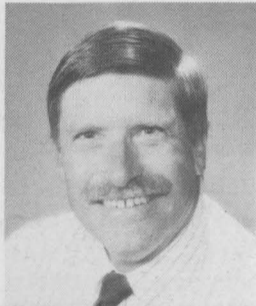
Dan Yee
20 8417



Dwight Soria
30 8515



Barry Hess
15 8220



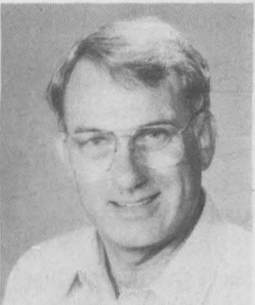
Ralph Clark
30 2266



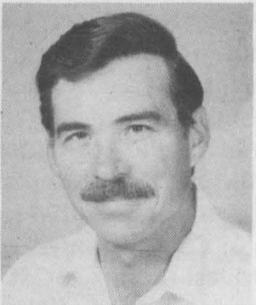
Belva Mayfield
20 8522



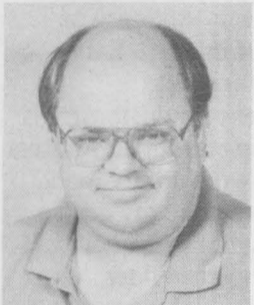
Geri Carson
15 8421



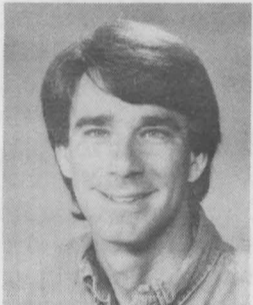
Rob Rinne
30 8104



Bill Hobson
15 8419



Richard Gay
20 8930



Andy Lutz
15 8345



Ken Campbell
30 7433

Learn to design your own micromachines

How to design and build micromachines using Sandia technology — the most sophisticated in the world — will be the subject of a short course Oct. 22-24 at Sandia/New Mexico. The course is open to all Sandians on a first-come, first-served basis.

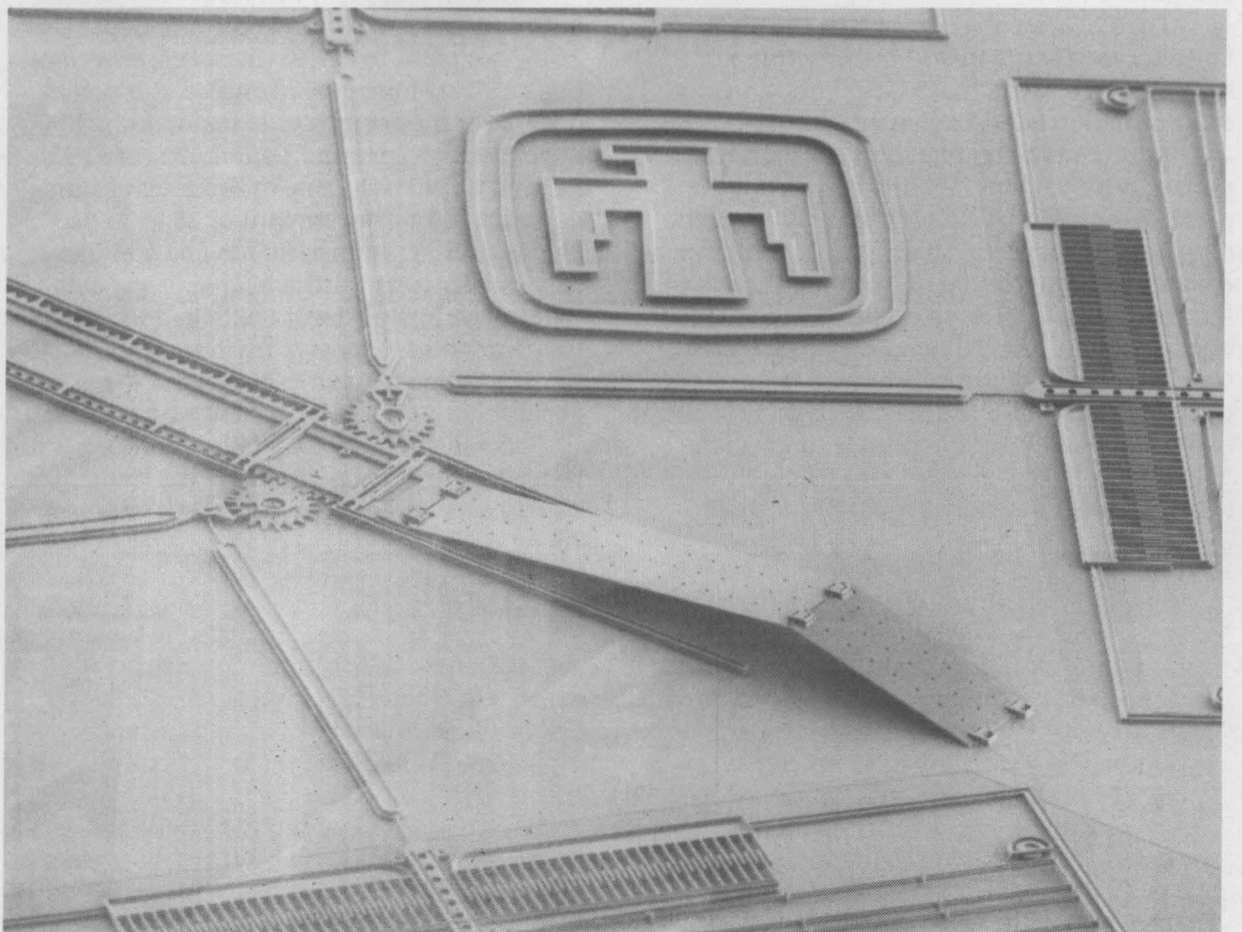
Micromachine gears are smaller in diameter than a human hair.

"We're opening up access to a unique Sandia technology," says Paul McWhorter (1325), project manager.

The course includes a survey of micromachine technologies as well as instruction on the Sandia three-level, polysilicon, surface-micromachining technology. In a hands-on third day, design rules and other practical information will enable students to design their own machines.

Twelve people will be accepted for the \$500 course by e-mailing Carole Craig Barron (1325) at cbarron@sandia.gov. The charge to actually make a machine on a wafer production run will cost \$10,000.

"The course is designed to explain what micromachines can do and to help those with projects of their own to design tiny sensors or motors that would work in their own projects," says Carole.



MICROMIRROR — From Sandia's Microelectronics Development Laboratory, this is an optical mirror created to steer laser light for weapons surety components in support of the Weapons System 2010 Program. Each gear tooth is about the size of a red blood cell.

Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads Sandia Classified Ads

MISCELLANEOUS

FURNITURE, 6 pieces: sofa, 2 chairs, 1 coffee table, 2 nightstands, \$300 OBO. Thai, 332-1518.

TWO COUCHES, 2 ottomans, end table, entertainment center, king-size waterbed complete w/6 drawers underneath. Garcia, 275-6515.

KING-SIZE BED, frame, box spring, mattress, \$80; oak bookcase headboard, \$50. Stearns, 298-0444.

SKIS, Rossignol, 183cm., Marker M38 bindings; bicycle, Fuji, 12-spd., 20-in.; speakers, Yamaha, bookshelf, \$40 pair; wood CD rack, \$10. Levin 266-6186.

KNITTING MACHINE, CompuKnit/ST, w/accessories & books, \$600; ACE preschool teacher's manuals, \$100; IBM PC, \$100. Miranda, 293-8644.

SOFA & LOVESEAT, ivory set, near perfect condition, \$800 OBO. Harms, 839-4852.

PENTIUM PROCESSOR, Intel 75Mhz, w/heat sink & fan, upgrading, \$50. Ennis, 836-0504.

SOFA, light tan, pillow back & foot rest, \$50. Hund, 281-5297.

BORLAND C++ COMPILER, version 4.52, CD-ROM, w/books, \$60 OBO. Clark, 323-9005.

CHROME REAR BUMPER, new, V-style, 10-in. drop, fits Fords from '80 to '96 series, \$185. Ortiz, 831-6000, 9 a.m.-2:30 p.m.

FUTON, 8-ft. pine frame, twin-size mattress, \$175 OBO; coffee table, butcher block w/chrome frame, \$25 OBO. Lopez, 291-0010.

AT&T COMPUTER, monitor, Okidata Microline 192 printer, several disks, \$240; 230-amp Wards AC welder, \$150. McCabe, 294-6689.

BROWN LEATHER COUCH, 72", 3-cushion conventional, \$200; like-new Huffy mountain bike, \$90; street bike, \$35. Daniel, 260-0461.

BRASS FIREPLACE TOOL SET, brass fireplace wood holder, \$50. Smith, 299-6873.

NIKE AIRMAX CROSS-TRAINING SHOES, black, size 10-1/2, originally \$120, sell for \$50 OBO. Bonaparte, 296-4916.

DINETTE SET, w/wood tabletop, 2 padded chairs, brass frames, 36" x 36"; wedding dress, size 8; Kachina dolls. Polito, 298-3859.

SUNBEAM TABLETOP GRILL, w/three 1-pound propane bottles, never used, \$15; 19-in. TV, w/swivel base, rarely used, \$45. Hayes, 299-1200.

PARK BICYCLE REPAIR STAND, w/tools, parts, manual, \$225; IBM XT computer, 155MB, w/Epson printer, \$175. Sparks, 266-5060.

MODULAR ONKYO STEREO SYSTEM, 80W amp, tuner, CD player, cassette, pair of floor-model Altec speakers, boxes, manuals, cables, \$410. Dybwad, 296-9047.

SOFA & LOVESEAT, 2 end tables, 2 coffee tables, \$350. Pena, 898-2388.

DINING TABLE, light oak, w/6 chairs, leaf, 3 months new, paid \$550, sacrifice for \$400. Milliman, 286-0508.

RECORD COLLECTION, 5,000+ albums, 33-1/3 and 78s, individual records, '30s, '40s, '50s, & '60s, all types of music. Stuart, 345-6358.

MERCURISER SHOP MANUALS (3), assembly tools, \$30; new Merc hydraulic lines, \$5/ea. Meikle, 299-4640.

WALNUT HI-FI CABINET, Barzilay, heavy, good woodworking material, \$25 OBO. Bingham, 298-6489.

EUREKA EXCALIBUR VACUUM, \$75; Bissell carpet cleaner, \$75; drafting table, 42" x 30", \$500; motorcycle jacket, 38, \$150. Malcomb, 294-6975.

BABY ITEMS: oak bassinet, \$50; Johnny Jump Up, \$15; car seat, \$20; bouncing seat, \$10; REI backpack, \$50. Crafts, 831-5234.

SLIDE/MOVIE PROJECTION SCREEN, 40" x 40", \$30; one set of Marker M29V ski bindings, never used or mounted, \$300. Moyer, 828-9214.

PIANOLA PLAYER PIANO, w/75 music scrolls, works great, would make a great beginner's piano, \$850. Williams, 344-9276.

ANTIQUA FOUR-DRAWER DRESSER, w/beveled mirror, \$125; small microwave, \$30; large humidifier, \$30. Gorman, 292-7119.

WICKER SOFA & CHAIR, iron sofa & chair, mission chair, Cushman coffee table, Windsor rocker, pool supplies. Kraus, 877-1448.

NORDICTRACK PRO, w/workout computer, \$250 OBO. Preston, 294-8595, after 5:30 p.m.

TRUCK TOPPER, full-size long bed, \$75. Barthelme, 286-1491.

FIREWOOD, 1-1/4 cords, seasoned, mixed wood from yard, you haul, \$125. Bauer, 266-8480.

HOTPOINT ELECTRIC DRYER, \$100; 2 Goodyear tires, 245/45ZR17, \$65/ea.; Century car seat, like new, \$30. Levan, 293-0079.

COMPACT REFRIGERATOR, small electric heater, electric lawn edger, electric hedge trimmer. Henry, 266-6467.

MOTOROLA CELLULAR PHONE, 3-watt bag-type phone, 12-volt adapter, \$60. Renschler, 281-1797.

DIGITAL MICROWAVE OVEN; Chev. van captain's chairs; Eureka/Singer vacuum cleaners; '78 Chev. pickup, 4-spd., w/fiberglass shell. Crosby, 858-3128.

ANTIQUA OAK TABLE, w/4 oak chairs, \$450. Olbin, 275-2681.

KARASTAN CARPET, off-white, 4 bedrooms, living & dining room, 150+ sq. yds., excellent condition, \$400. Chorley, 296-1454.

SOFA SLEEPER, La Crosse, 5-1/2-ft. wide, upholstery & structure in great shape, \$110 firm. Randolph, 299-2057.

FOUR CEMETERY LOTS, Sunset Memorial, Albuquerque, valued at \$800 ea., sell for \$500 ea. Mincks, 1-510-447-3649, call collect.

HP LASERJET & LASERJET PLUS printers, serial and/or parallel input ports, \$25-\$165 ea. depending on condition. Schkade, 292-5126.

BLACK COFFEE TABLE, glass top, brass trim, 24" x 60", \$150. Longcope, 821-6817.

FREE FILL DIRT, approx. 1 yard, you haul; Tamron 100-400 f5.6 AF zoom for Maxxum, lens shade, \$500. Brooks, 275-0056.

FULL BED, \$75; 4 comforter sets, extras, \$30-\$90; armoire, 2 drawers, \$45; white wicker furniture, \$75. Wilson, 836-7183.

STEREO, Harmon Kardon integrated amplifier, HK-PM650, 50W/channel 8-ohms, 175W/channel 2-ohms, \$200; Akai digital AM/FM tuner, \$75. Smith, 856-1567.

SUPER NINTENDO SYSTEM, 2 controllers, 5 games, Game Genie, Super-Scope w/6 games, \$185 OBO. Donald, 237-9288.

CHRYSLER HEADERS, \$40; Pioneer speakers, \$90 new; slant-six engine, needs overhaul, \$100. Bordlemay, 883-4926.

AEROBIC RIDER, by Healthrider, barely used, \$185. Crego, 292-0266.

ZENITH TV, 46-in. projection screen, stereo, PIP, 22 mos. old, \$800 OBO. Madrid, 271-9752.

COUCH, 6-ft., queen-size hide-a-bed, like new, \$225. Hernandez, 328-3563.

KING BEDROOM SET, \$400; bunk beds, \$75; wedding dress, \$50; Technics turntable, \$20; Beta VCR, \$20. Underwood, 246-8281.

RANGE HOOD, vented to outside, almond, 4 yrs. old, excellent condition, \$20. Meeks, 828-9825.

ANTIQUA DRESSING TABLE, original beveled-glass mirror, 8 drawers, dark wood, 75+ yrs. old, \$200. Buckentin, 271-8771.

JOINTER, Rockwell, 4-in., \$150 OBO; bench drill press, Grizzly 14-in., \$175 OBO. Oborny, 299-8509.

WORD PROCESSOR, w/printer, Canon Starwriter 60, multiple fonts, sizes, styles, quiet, small, like new, \$140. Drotning, 821-9598.

BANJO, '88 Stewart-MacDonald 5-string resonator, mahogany w/dot inlays, great tone & condition, superior beginning instrument, \$600. Bryan, 281-7542.

QUEEN-SIZE BED, good condition, no headboard, \$100. Simmons, 891-2475.

HARDCOVER BOOKS, artists (65), sci-fi (65), & classics (40), \$4/ea. or 10% off for all. Laguna, 298-1732.

SIX-IN-ONE GAME TABLE, convertible, air hockey w/electronic scorer, \$250; 2 sofa/loveseat sets, 1 w/matching lampshades, \$800/\$650. Moonka, 856-1110.

STEGLER UPRIGHT PIANO, like new, walnut finish, nice, 3 yrs. old, \$3,000 new, asking \$1,800. Elbring, 243-1454.

PIE SAFE, pine reproduction; 4 folding chairs; 3-drawer file cabinet; black wrought-iron baker's rack. Kesti, 821-9208.

PUPPIES, adorable Chihuahua mix, 7 weeks old, free to good home. Tafoya, 873-8077.

COUCH, w/loveseat, easy chair, coffee table, 2 end tables, 2 lamps, \$550. Ginn, 296-6548.

BEDROOM SET: headboard, nightstand, chest of drawers, mirrored chest, \$500; baby jogger, \$60. Manzanares, 836-4697.

DEADLINE: Friday noon before week of publication unless changed by holiday. MAIL to Dept. 12640, MS 0165, FAX to 844-0645, or bring to Bldg. 811 lobby. You may also send ads by e-mail to Nancy Campanozzi (nrcampa@sandia.gov). Questions? Call Nancy at 844-7522. Because of space constraints, ads will be printed on a first-come basis.

Ad Rules

1. Limit 18 words, including last name and home phone (We will edit longer ads).
2. Include organization and full name with the ad submission.
3. No phone-ins.
4. Use 8 1/2" by 11-inch paper.
5. Type or print ad; use accepted abbreviations.
6. One ad per issue.
7. We will not run the same ad more than twice.
8. No "for rent" ads except for employees on temporary assignment.
9. No commercial ads.
10. For active and retired Sandians and DOE employees.
11. Housing listed for sale is available without regard to race, creed, color, or national origin.
12. "Work Wanted" ads limited to student-aged children of employees.

TWO SIGNS: "For Sale by Owner," w/stands, w/riders; "Open House," "By Appointment," arrow; \$30. Roeske, 255-6188.

QUEEN-SIZE WATERBED, w/heavy-duty frame, Rainbow Classic, excellent condition. Jaramillo, 296-7516.

CHRISTMAS CRAFT ITEMS: greenery, picks, poinsettias, baskets, ribbons, etc.; medium-size pet carrier, \$20. Hubbard, 293-2819.

BEDROOM SET, 10-piece, white, double twin w/foundation, dresser, etc., \$350; dog cage, medium, \$18; stationary bike, \$45. Garcia, 888-3686.

TV/CD/VCR CABINET, teak, 38W x 20D x 22H, \$145. Stephens, 766-6674.

COMPUTER, Macintosh IIsi, SMB RAM, 80MB HD, 13-in. monitor, extended keyboard, \$400; fax modem, \$150. Kepler, 296-0402.

DAY BED, w/trundle, white iron, no mattresses, \$75. Echeverria, 293-6198.

WET BAR, walnut, double stainless sinks, fluorescent light, storage cabinets, make offer. Bullock, 286-1910.

CAPTAIN'S BED, handmade, white oak, over 4 dresser drawers, w/ladder, \$350; L.L. Bean rocker, \$100. Altman, 332-3572.

FOUR DISNEY MEAL TICKETS, at Disneyland, expires 9/30/96, \$60 value, \$30/all. Aranda, 255-6149.

LA-Z-BOY RECLINER, beige corduroy, \$50; fruitwood traditional stereo cabinet, no components, handyman's dream, \$50. Luikens, 881-1382.

SUZUKI QUARTER-SIZE VIOLIN, \$195. Jones, 843-9645.

BABY CRIB & MATTRESS, \$250; hitch haul carrier, w/side rails, brand new, \$65; old cabinets, \$40; white spoke, 14-in. wheels, \$40. Davis, 828-1931.

TRANSPORTATION

'92 SUZUKI SIDEKICK, 4WD, soft top, CD player, 31K miles, \$7,995. Werner, 292-5520

'92 FORD F-150, 4x4, Supercab, loaded, excellent condition, rigged for towing 5th-wheel trailer, \$14,900. Schnetzer, 292-0733.

'89 PLYMOUTH HORIZON, 4-dr. hatchback, AT, AC, AM/FM, 64K miles, new tires, runs well, \$2,600. Arlow, 298-1770.

'68 CORVETTE ROADSTER, white, on-frame restoration, 2 tops, PW, 327/350-h.p., 4-spd., 48K miles, \$15,000. Wrobel, 293-0283.

'89 HONDA PRELUDE, low mileage, maintenance records, car cover, CD player, moon roof, \$9,500 OBO. Herrera, 294-4403.

'87 GMC JIMMY S-15, 4x4, 88K miles, tan & cream, new tires, \$5,200. Simon, 299-8468.

'77 BMW 320i, \$1,500; '87 Ford Bronco II, 4x4, \$4,400; both in good condition, must sell. Morrow, 299-5588.

'85 OLDS. TORONADO, 138,617 miles, bids accepted through 10/02/96, right to refuse bids, subject to prior sale, as is. SLFCU, 237-7384.

'93 TOYOTA PASEO, 5-spd., AC, excellent condition, great m.p.g., spoiler, sunroof, 42K miles, \$8,500. Sellers, 344-5583.

'82 MAZDA PICKUP, long bed, 5-spd., passed emissions test, good tires, 91K miles, \$1,500. Patterson, 831-3454.

'62 CHEV. IMPALA, no motor or transmission, 4-dr., body good condition, \$1,100. Ferrell, 883-8595.

'70 MERCURY COUGAR XR-7, 3-spd., 135K miles, original owner, runs great, best offer over \$2,000. Kolesar, 293-8367.

'85 FORD F-350 PICKUP, dually, 65K miles, 460 engine, excellent condition, \$6,500. Allen, 299-9075.

'72 CLASSIC JEEP CJ-5, V8, \$2,800 OBO; new truck tonneau cover, \$150 OBO. Wright, 856-6923.

'85 VW JETTA, runs great, nice interior, AC, sunroof, needs paint, excellent student car, \$2,200 OBO. Dunham, 828-1755.

'92 MAZDA MPV LX, 2WD, 6-cyl., white, many extras, excellent condition, 73K miles, \$11,300 OBO. Conway, 271-0770.

'94 LAND ROVER DISCOVERY, 28K miles, 4x4, 5-spd., V8, PW, PL, ABS, AC, under warranty, \$23,900. Alvin, 294-5170.

'65 FORD GALAXY XL 500, convertible, good condition, \$7,000 firm. Goff, 266-3057.

'95 CHEV. 3/4T LONG CONV. VAN, 8-cyl., hightop, 18K miles, TV, VCR, front/back radios/air, extras, \$24,000. Kaufmann, 292-9249.

'57 THUNDERBIRD, both tops, excellent original condition, \$28,500. Everett, 268-7818.

'90 DODGE GRAND CARAVAN SE, AC, PS, AM/FM cassette, PL, PW, cruise, running boards, 75K miles, \$7,500. Herrera, 884-4925.

'88 CAMRY DX WAGON, 5-spd., AC, power package, 1 owner, high highway miles, below book, \$3,500. Blejwas, 294-2057.

'94 PONTIAC GRAND AM, 36K miles, 4-dr., 5-spd., AC, ABS, rear spoiler, excellent condition, \$10,000 OBO. Lemon, 896-0388.

'94 FORD EXPLORER XLT, excellent condition, AC, power everything, 4-dr., 41K miles, must sell, \$17,200 OBO. Mooney, 281-2612.

'93 FORD TAURUS GL WAGON, PW, cruise, ABS, air bags, \$8,300. Hart, 291-8774 or 292-5110.

'90 HONDA ACCORD EX, loaded, 4-dr., AT, garaged, service records, excellent condition, below book, \$8,200 OBO. Ludwig, 856-5111.

'95 DODGE DAKOTA CLUB CAB SLT, 4x4, V6, 5-spd., snug-top shell, excellent condition, below book, \$16,000. Benecke, 286-2154.

'94 CHEV. CORVETTE, blue/gray, AT, loaded, warranty, \$26,995 firm. Walker, 828-1054.

'86 JEEP CJ-7 LAREDO, 6-cyl., 5-spd., new tires, HT, 60K miles, garaged, \$7,500 OBO. Lewis, 821-7972.

'93 FORD FESTIVA, 23K miles, blue, 5-spd., AM/FM cassette, below blue book, \$3,799. Von Loh, 877-4140.

INTERNATIONAL SCOUTS: '76 Traveler, '79 Scout II for parts, \$4,250 OBO for both. Bailey, 281-4766.

RECREATIONAL

HOUSEBOAT, Dam Site Marina Elephant Butte, 24' x 32', unfinished interior, no engine, \$15,000. Cotter, 237-1127.

'84 NISSAN BOAT MOTOR, 5-h.p., low hours, long shaft, 2-stroke. Garcia, 294-5885.

REI NOVARA MOUNTAIN BIKE, full suspension, aluminum, GripShift, all XT, RockShox XC, hardly ridden, \$1,300. Leslie, 293-0339.

'75 KAWASAKI Z1 900, good condition, 14K miles, \$800 OBO. Knighton, 286-8311.

WHITE-WATER RAFT, \$150 OBO; alloy wheels, \$75 OBO. Gough, 822-0090.

'95 JAYCO DESIGNER TRAVEL TRAILER, 31-ft., loaded, AC, micro, awning, stereo, more, used once, must sell, job change. Thompson, 823-4567.

BOY'S BICYCLE, 20-in., 1-spd., looks like motorcycle, hardly used, \$100 OBO. Laiche, 271-0171.

MACGREGOR SAILBOAT, 26-ft., like new, \$13,500; PS1 IBM computer, monitor, printer, 4xCD, \$1,200. Nation, 293-9051, ask for Mary.

'92 YAMAHA WAVERUNNER, 650 VXR, stainless impeller, cover, \$3,250 OBO. Hansen, 275-9917.

TIMESHARE, Otra Vez, Santa Fe, 2 floating weeks, 1-bdr., sleeps 4, RCI distinction, \$4,000 per, low annual fee. Griego, 265-2130.

'74 DODGE MOTORHOME, Balboa, 19-ft., well-maintained, \$4,500 OBO; '70 Ford half-ton truck, \$950 OBO. Johnson, 255-0208.

'89 GEORGIA BOY ENCOUNTER, 34-ft., basement model motorhome, 460 Ford, oak package, excellent condition, \$40,000. Cunningham, 344-9841.

REAL ESTATE

2-BDR. CONDO, Durango/Purgatory, Colorado, 2 baths, fully furnished, fireplace, deck, transferred, must sell thousands below appraisal, \$56,800. Hanks, 815-777-3441.

3-BDR. HOME, Placitas, 2 acres, 3,200 sq. ft., 2 baths, vigas, Italian tile, wet bar, office/study, transferred, must sell low end of appraisal, owner/agent. Hanks, 815-777-3441.

1-BDR. TOWNHOME, 2 baths, 1,665 sq. ft., Academy Ridge, light, bright, in popular school district, \$163,579 owner/agent. Iverson, 293-5139 or 858-8375.

ACRE LOT, North Albuquerque Acres, beautiful city/mountain views, owners must sell, \$94,000. Herrera/Hoffman, 342-6265 or 822-8244.

.89-ACRE LOT, North Albuquerque Acres, south side of Florence, six lots west of Browning, \$74,900. Hall, 299-0009.

4-BDR. HOME, 1-3/4 baths, 1,800 sq. ft., den w/fireplace, screened patio, large cul-de-sac lot, Bellehaven area. Castorena, 296-9785.

2-BDR. HOME, 1 bath, huge heated 1-car garage/workshop, 2.7 wooded acres, East Mountain area, secluded, great views, \$90,000. Draper, 281-2663.

2-BDR. MOBILE HOME, 14' x 70', Breck, set up in quiet park, 2 baths, immaculate inside & out. Lucero, 833-1396.

WANTED

HOUSEMATE, 3-bdr. solar-adobe home, west side near St. Pius, \$350 + gas/electric, female preferred. Rivers, 864-2335.

DOUBLE STROLLER, inexpensive for foster parents w/3 kids under 4 yrs. old. Sisneros, 292-1854.

FEMALE SOCCER PLAYERS, experienced, for a U12 Duke City soccer team (Classic Diamonds), must be born in August 1984 or after. Fraley, 858-1822.

CARPOOL, from Las Maravillas/Paros area, 9/80 schedule, 7:30 a.m.-5 p.m., Mon.-Thurs. Vigil, 865-6187.

OAK DRESSER W/MIRROR, oak coffee table, good condition. Vigil, 880-0026.

CAR SEAT, good condition. Stoezel, 294-5091.

OWNER'S MANUAL for Epson L-1000 printer, to buy or borrow. Leeman, 281-7949.

USED CANOE, reasonably priced. Phillips, 262-0987.

EPILADY, in good condition. Beck, 299-7225.

INFLATABLE RAFT, 2- or 3-person, in good condition, with or without accessories. Kerr, 299-7527.

KING-SIZE HEADBOARD, solid back, good condition, hardwood. Barnette, 861-2450.

TICKETS for the Bulls game Oct. 11, for an International Education Forum student. Holt, 294-6928.

TV ANTENNA & ROTOR, fringe-area antenna with 100-mile range, rotor capable of turning accompanying antenna. Lennox, 821-0474.

INEXPENSIVE BLONDE WIG, for a costume. Wagner, 823-9323.

HANDYPERSON, to build cover for crawlspace entry. Doran, 255-9321.

BOXER'S HEAVY BAG; guitar case; truck jack, hydraulic or scissors; good to fair condition for all. Cocain, 281-2282.

FOUND: Leatherman tool, east of 877 in Tech Area I. Cole, 844-1421.

FOUND: pocket knife, in parking lot near Bldgs. 831/832 (Medical, Human Resources, Benefits), found Tuesday, Sept. 17, describe & claim. Karnes, 880-1163.

Sandia News Briefs

Leonel Miranda accepts DOE 8(a) small-business-contracting award for Sandia

Leonel Miranda, Director of Economic Impact and Supplier Relations Dept. 10203, accepted on behalf of Sandia a Special Performance 8(a) Pilot Program Award from DOE Secretary Hazel O'Leary at the Small Business Awards ceremony. The event was held in Washington, D.C., in late August. DOE's 8(a) pilot program is designed to encourage additional subcontracting by management and operating contractors. It is limited to purchases under \$3 million. The program authorizes management and operating contractors to make noncompetitive awards to 8(a) certified firms at fair market prices (with no premium to be paid to participating 8(a) companies). The Special Performance 8(a) Pilot Program Award was presented in recognition of Sandia's outstanding achievement in providing substantial contracting opportunities to small businesses.

Berweida Learson selected as a Lockheed Martin Human Resources Achievement winner

Berweida Learson, Manager of Diversity Planning Program Dept. 3612, has been selected as a Lockheed Martin Human Resources Achievement Award winner representing the Energy and Environment Sector. As a winner, she has been invited to attend the 1996 Lockheed Martin Human Resources conference in Newport Beach, Calif., on Sept. 30-Oct. 2 to receive her award and to present a 20-minute overview of Sandia's highly regarded diversity program. Sandia will also be represented at the conference by Human Resources Division 3000 VP Charlie Emery and Human Resources Center 3500 Director Don Blanton. In nomination materials submitted by Charlie on Berweida's behalf, he stated that over the past four years, she has "led and energized one of the most successful and innovative diversity implementation efforts in corporate America." The nomination noted that Berweida's efforts led to development of Sandia's Diversity Leadership Strategic Plan and to the evolution of a community effort focused on diversity — the first of its kind in the nation.

Sig Hecker decision to leave LANL 'a very significant change,' Paul Robinson says

Sig Hecker, Director of Los Alamos National Laboratory for the past decade, announced last week that he will resign his position effective Oct. 1, 1997. Hecker, who began his career at the lab in 1965 as a summer student, said he wants to return to research, adding that he especially hopes to help bring along the next generation of plutonium metallurgists. Sandia President and Director C. Paul Robinson, a former LANL colleague of Hecker, said: "Sig Hecker's announcement represents a very significant change for our sister laboratory. Dr. Hecker indeed faced many challenges over his tenure as Los Alamos' Director with the huge changes which the end of the Cold War spurred for the nuclear weapons labs. In such a high-pressure job and environment, 12 years of exceptional service is deserving of a change to less hectic demands. Sig has become one of the major advocates for research on the national scene, and his eloquent arguments for science have been effective. His decision to return to research activities strikes me as a profoundly sensible step for such a talented scientist, and I am sure that the nation will benefit from his technical contributions in the future. I wish him and the laboratory all the best in this transition." The University of California soon is expected to establish a search committee to begin the process of choosing a successor.

Sandia, DOE, & Kirtland to present Disabilities Awareness Month speakers, events

October is National Disabilities Awareness Month, and Sandia is promoting awareness through a series of events in conjunction with DOE and Kirtland Air Force Base. DOE/AL will sponsor a talk by Randy Snow, many times national disabled tennis champion and 1992 Paralympic tennis gold medalist, on Oct. 8 at 10 a.m. in conference rooms A, B, and C of DOE Bldg. 381.

Sandia's Disability Awareness Committee is sponsoring a talk by Dr. Andrew Pope, Senior Staff/Study Director of the Institute of Medicine, who will be speaking on environmental and occupational influences on human health and disabilities. The talk will be given Oct. 16, 11 a.m., at the Coronado Club. At the Club's entrance that day a group from the Disability Awareness Committee will recruit people to

volunteer wearing a sling on their prominent arm to learn what adaptations even a small disability can force.

On Oct. 19 at Kirtland's East Gym bowling alley, teams from Sandia, DOE/AL, and Kirtland will compete with Special Olympic teams from around New Mexico in the Unified Olympics at 11:30 a.m. On Oct. 29 in the Kirtland Officer's Club will be an 11:30 a.m. luncheon with Sylvia Walker, chairperson of the President's Committee on Employing People with Disabilities.

For more information about Sandia's events, call Linda Dailleboust (7524) at 848-0979 or Sandra Hinton (3611) at 271-7992. For more information about DOE's events, call Mike Perez at 845-5504. For more information about Kirtland's events, call Capt. Turetsky at 846-4519.

Thunderbirds to highlight KAFB open house

Kirtland Air Force Base on Saturday, Oct. 5, will open its gates to the public for "Heritage '96," the base's first open house and air show in four years. Gates open at 9 a.m. for the free event, which is part of the Air Force's year-long celebration of the service's 50th anniversary. The USAF aerial demonstration team, the Thunderbirds, is scheduled to perform. A flyby of a B-2 stealth bomber is also scheduled.

More than 30 aircraft will be on display, including the F-117 stealth fighter, a B-1B bomber, a C-17 transport, and AWACS aircraft, aerial refueling aircraft, and numerous other fighters, trainers, helicopters, and support aircraft.

Because of limited parking space near the flight line, free parking and shuttle service will be provided from the UNM Pit and football stadium. The shuttle will run continuously throughout the day.

No coolers, grills, or alcoholic beverages are permitted; concessions will be available on-site. The base gates will close at 2:30 p.m.; following the Thunderbird performance, the Truman, Carlisle, and Maxwell gates will open for outbound traffic only. The base will close to the public at 4 p.m.

For details, call the base's Open House Hotline at 505-853-0853.

Coronado Club

Sept. 26 — Thursday bingo night. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

Oct. 3, 10, 17 — Thursday bingo night. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

Oct. 4 — "Western Night" dinner/dance. \$7.95 all-you-can-eat buffet, 6-9 p.m. Music by Isleta Poorboys, 7-11 p.m.

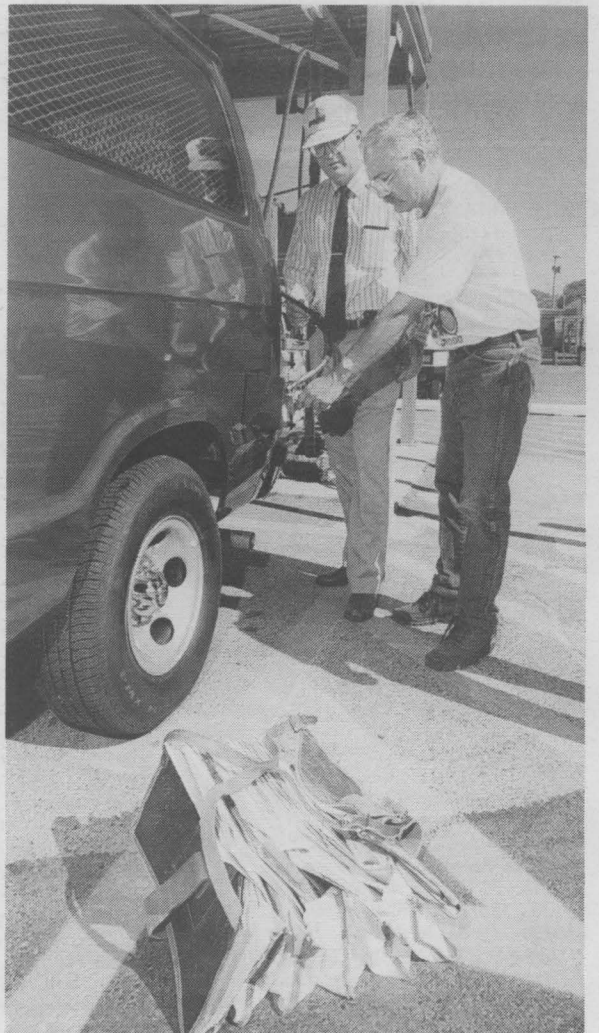
Oct. 6 — Sunday brunch buffet, 10 a.m.-2 p.m. \$6.95 all-you-can-eat buffet. Kids 3-12, \$1, under 3 free. Music by Fine Wine, 1-4 p.m.

Oct. 11 — Kids' bingo night. Buffet, cartoons, and movies 5-8 p.m., bingo 7-9 p.m. Free hot dog and soft drink for all kids playing bingo. Cost is \$2.50 per child.

Oct. 18 — Tuxedo Junction. "Big Band sound" music and dancing, 7-11 p.m. Prime rib or fried shrimp dinner \$9.95.

VPs to present strategic goals

A reminder to employees: As reported in the Sept. 13 *Lab News*, presentations by eight Sandia vice presidents plus Executive VP John Crawford on the future of the Labs and Sandia's Strategic Objectives will be made in sessions Thursday, Oct. 3, and Tuesday, Oct. 8, in Bldg. 825. Each starts at 10 a.m. MDT and will be videoconferenced to the 904 Auditorium at Sandia/California (9 a.m. PDT).



JUST NATURAL — Richard Gillis of Public Service Company of New Mexico's Alternative Fuel Vehicles Group, left, shows Fred Silva (7613) how to refuel one of Sandia Mail Service's new natural-gas-powered vehicles at the Sandia Fleet Services. Receiving and Distribution Dept. 7613 is switching all nine of its vehicles to compressed natural gas. In a general conversion program initiated by William Rose, Manager of Fleet Management Services Dept. 7614, some 30 vehicles at Sandia are now powered by natural gas and the numbers are rapidly increasing. DOE's goal is that within the next several years 50 percent of all Sandia's vehicles will be powered by alternative fuels.