SEMATECH, Sandia, and the dramatic turnaround of the US semiconductor industry

Sandia has played a strong role in one of the biggest business success stories of the decade

By Ace Etheridge

Lab News Staff

When Paul Robinson and John Crawford met with Bill Spencer in Austin, Texas, two weeks ago, they were living in a world that had changed considerably since the first meeting between Sandia and SEMATECH officials back in the late 1980s.

Back then there was a Berlin Wall, a Soviet Union, and underground nuclear testing. Today the employees of Sandia and other national labs are meeting new challenges created by changing international and domestic situations.

Semiconductor industry fortunes also have changed since the late 1980s. As that decade drew to a close, the American semiconductor industry was lagging behind Japan to the point that some people were projecting that by the mid-1990s, US semiconductor and semiconductor equipment manufacturers would have less than a quarter of the world market share.

American business and political leaders are pleased to report that it hasn't worked out that way. Through the major efforts of SEMATECH, the US manufacturers have reclaimed the lead in equipment manufacturing and are closing the gap with the Japanese in chip sales. More than a few Sandians share some of the credit for helping this economic turnaround.

Sandia's involvement in one of the business success stories of the decade began in the summer of 1989, when Sandia signed an agreement with SEMATECH, the Austin-based consortium of US semiconductor manufacturers, to develop tool design models and methods to improve future generations of semiconductor manufacturing equipment.

US manufacturers have reclaimed the lead in equipment manufacturing and are closing the gap with the Japanese in chip sales.

That 30-month technical assistance agreement has grown into a multiyear partnership worth well over $100 million, in the form of a cooperative research and development agreement (CRADA) that has been the springboard for more than 100 individual projects.

Sandia's two top executives, President and Laboratory Director Paul Robinson and Executive VP and Deputy Director John Crawford, met with SEMATECH President William "Bill" Spencer on May 24 to discuss the current CRADA activities as well as future partnering and funding plans.

Chuck Gwyn (1302), who returned to Sandia from a job in private industry to coordinate the Labs' work with SEMATECH, also was at the meeting. He says both the Sandia and SEMATECH people agreed that they need each other.

Sandia's unique attributes ideal

"Sandia's partnerships with the electronics industry, and with SEMATECH in particular, are a critical part of our future," says Paul.

SEMATECH President Spencer also says cooperative research is vital for the nation's economic health. "Large corporate research labs as sources of invention have largely disappeared," he explains. "This void must be filled with the combined strength of the federal government, universities, and industry."

Chuck says Sandia has attributes that

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Sandia National Laboratories

Sandia LabNews

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Radiation detectors shrink as sensitivity and uses grow

By Nancy Garcia

California Reporter

Agents working in the field to find and halt the spread of nuclear materials must use bulky equipment whenever they need to distinguish on the spot between natural background radiation emanating from concrete or marble and radiation characteristic of a nuclear weapon. Preparing the equipment for use requires precooling for a few hours.

The promise of creating compact, portable detectors that work immediately at room temperature with this degree of accuracy has caused a research program initiated under Ralph James of Advanced Electronics Manufacturing Technologies Dept. 8250 to grow some 30 percent annually since 1987. The program is funded at approximately $3.1 million today.

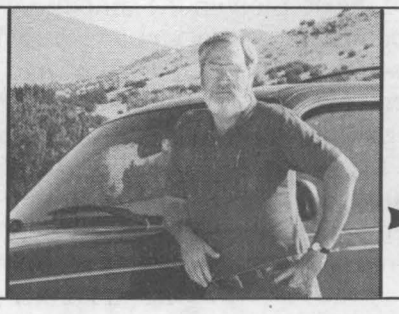
Ralph's lab, a designated DOE user facility, last year helped 14 US companies — representing most manufacturers of compact X-ray and gamma-ray detectors — to fabricate, test, and characterize advanced radiation sensors. The lab also makes prototype detector and sensor systems for Sandia, two of which have set world records, for devices of their type, in energy resolution.

Finding a nuclear weapon

"The work really started with the need to find a nuclear weapon in a search," Ralph says. Because stone and concrete contain radioisotopes of such elements as potassium,

(Continued on page 3)

SLIP-SLIDE AND AWAY — Security Officer Jacob Aragon (7435) watches as Sandra Madril, center, and Phoebe Terry (both 4414) use new badge readers to enter Bldg. 802. The badge readers were added during renovation of the Bldg. 800 lobby area, replacing the old guard gate. They are part of the effort to soften the appearance of security requirements as Sandia's mission evolves in the post-Cold War world, bringing more visitors from industry and nondefense work to the Labs.



This & That

Cesar's magic crystals – Sandians have invented and patented lots of high-tech gizmos and products over the years, but one employee invented something many of us use daily. Cesar Lombana, Manager of Business Analysis Dept. 4525, invented the process that turns Juan Valdez's mountain-grown coffee beans into instant Folgers® crystals. Cesar (a chemical engineer) and his technician invented the process when Cesar was with Proctor & Gamble in 1967-68. He joined Sandia in 1991 and is now involved in technology analysis, developing and implementing business/marketing plans, organizing alliances, and assessing strategic opportunities for the Labs.

So, does Cesar drink his own brew? He says he prefers freshly brewed coffee, especially when he can blend the beans. He usually drinks 7-10 cups a day, depending on "how much shaking I can stand that day."

* * *

Back above management heaven – Believe it or not, I've moved again – back to the fourth floor of Bldg. 802, Room 4100. It was fun breaking in the new Communications Bldg. 811, but as I expected when I left 802 a couple of months ago, upper management had a rough time adjusting to my not being nearby to inspire and advise them.

Another reason I moved is to work with a new team that is redesigning Sandia's External Web – making it more customer friendly and attractive, and refining the information approval and posting processes. I'll be working mostly with a small group called Advanced Communications 12630 led by Manny Ontiveros, and with John Larson (4821) of the Chief Information Officer group, who recently moved back to New Mexico from Sandia/California to upgrade and maintain the External Web.

Although I'm relinquishing most of my employee communications duties for now, I'll continue writing this column. I still enjoy it, especially poking fun at some things that need poking, and the contact with you readers. My phone number and e-mail address remain the same, but I'll have a different mail stop number (see bottom of column).

* * *

Friday Phone Follies – Most Sandians are diligent about updating their voicemail greetings, but some aren't, including too many who don't update greetings for their "9/80" Fridays off. It's especially irritating to hear a greeting like, "Your call is important to me, so leave a message and I'll get back with you soon," only to learn later that the person was gone for one or more workdays before hearing the message and returning the call. It only takes a minute to update your message, and your customers and fellow employees will appreciate it.

– Larry Perrine (845-8511, MS 0129, lgperri@sandia.gov)

Feedback

Q: If I am walking onto the base, will the Security officer let me on if I show my badge?

A: Yes, Security will let you through any Kirtland Air Force Base boundary gate if you show your Sandia security badge or your Sandia ID card. They may ask you the purpose for coming on base if it is not during normal working hours. Going to your office or to the Coronado Club are two good answers. I also think other people may accompany you through the gate when walking, since they can come through in your car. You can be walking or riding a bicycle. If you drive a motor vehicle (car, truck, motorcycle) that does not have the proper decal, you will need to get a temporary pass for that vehicle and show registration and proof of insurance. Protective equipment is required if you operate a bicycle or motorcycle.

Wayne Burton (7912),
Sandia Traffic Committee

Q: I am at a complete loss regarding the deletion of the US Savings Bond-A-Year option on a one-time basis. It would appear that instead of one yearly transaction, Payroll will now have 50. I subscribed to one bond a year at $50. Is the computer running us?

A: Payroll software in the US takes either periodic (with each payment) or declining-balance deductions. No commercial package will take one-time deductions. At Sandia, we no longer can afford to modify commercial software to do what it was never intended to do. The decision to discontinue support for bond-a-year was made and announced prior to last year's campaign. This year we have implemented the decision on the announced schedule. About 10 percent of employees used the bond-a-year option when it was offered. Any of these employees who wish to continue purchasing a single bond per year can do so quite simply by signing up for a weekly deduction of $1 ($100 bond). This is a simple way for all of these employees, including you, to achieve your financial goal.

Ralph Bonner (10500)

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LOCKHEED MARTIN

Chemical, biological weapon threats pose daunting challenges, says Paul Robinson

Combating the proliferation or terrorist use of nuclear, biological, chemical, or radiological weapons ranks as perhaps the most difficult technical problem of our times, Sandia President and Laboratory Director C. Paul Robinson told a conference in Washington May 23.

Nuclear proliferation has gotten substantial investments, but we are far less prepared to deal with chemical, biological, or radiological threats, Paul said. Much more can and must be done to deal with the possibilities, he said. He urged a systems approach, learning the possibilities that exist and developing diverse means of attacking the problem. "It is past time to begin to direct more efforts on the part of the US scientific and defense establishment to these topics."

Paul spoke in a panel at the Conference on Nuclear, Biological, and Chemical Weapons Proliferation and Terrorism, cosponsored by Los Alamos National Laboratory and the Harvard University Center for Science and International Affairs.

Paul noted that the US eliminated its offensive capability in biological weapons (BW) in 1972, its chemical weapon (CW) capabilities in the 1980s, and never has put much emphasis on radiological weapons. He reminded: "As Heraclitus said around 500 B.C., 'He who does not expect the unexpected cannot detect it.' "

A number of projects devoted to detection of CW and BW agents (many based on laser remote detection methods) are under way, and there have been some successes. "However, developing instruments and platforms to detect the full spectrum of possible chemical or biological agents is a far more daunting task, and I am unable to say, based on our present state of knowledge, whether it will some day prove to be possible or not."

The situation is most hopeful for chemical agents. He said point sensors that could provide near-instantaneous detection for a wide spectrum of chemical species are in development at Sandia and a number of other laboratories, using the "lab on a chip" concept. Using pattern-recognition techniques, a single array of sensors can discriminate among a variety of materials in real time. "Wet chemistry" approaches are now what is used in the field, and he said we need to find ways to greatly miniaturize and otherwise improve these systems.

"In my view," he said, "We need to rapidly achieve a 'systems view' of the total NBC [nuclear, biological, chemical] problem and, with analogy to a chess game, to begin to learn to think and respond 'several steps ahead' of adversaries, either nation-states or terrorists."

Retiree deaths

Everett Massey (87)	9461	April 4
Richard Richards (79)	2434	April 6
John Grenko (91)	7616	April 7
Andrew Lieber (68)	5290	April 8
Daniel Padilla (80)	1247	April 13
Daniel Russo (68)	7481	April 13
John Reynolds (71)	1522	April 15
Edmund Starr (81)	4614	April 16
Robert Vermillion (75)	7473	April 16
Francis Hale (83)	9636	April 18
David Werme (74)	3434	April 28
Dorothy Willis (92)	4136	April 29
Robert Spence (79)	7584	April 29

Sandia CaliforniaNews

Radiation sensors

(Continued from page 1)

thorium, uranium, and lead, an elevator shaft dense with concrete could potentially set off a false alarm. "You could have a situation," he says, "where we don't know if we walked past something that has a lot of concrete in it or if we walked past a nuclear weapon. It'd be very nice to have a device that can detect the presence of radioactivity and uniquely determine in the field which isotopes are responsible for the measured radiation."

Geiger counters and sodium iodide scintillators are widely used today to detect radioactive decay that emits gamma rays. The devices conveniently work at room temperature but have nonexistent or poor energy resolution. Germanium-based spectrometers have high energy resolution but must be cooled to about -180 degrees Celsius, which makes using them in the field difficult. Their bulky cryogenic system increases the instruments' weight to about 35 pounds, consumes a lot of energy, and needs almost daily maintenance.

A smaller system under development at Sandia weighs about six pounds, operates for weeks without maintenance, and runs on low power at room temperature. The weight and power demands may drop further by as much as an order of magnitude with incorporation of application-specific integrated circuits now being designed and tested at Sandia.

This is one of several wide-bandgap semiconductor devices Ralph's team is developing for use as compact X-ray or gamma-ray sensors. They can operate at temperatures ranging from about -30 to 80 degrees C, making them particularly suited for field applications.

"New field instruments are desperately needed to detect smuggling of special nuclear materials (SNM), such as plutonium and uranium, or production at clandestine facilities," Ralph says. "The emergence of a black market for SNM makes the threat of nuclear proliferation far more urgent and increases the number of parties who could successfully construct a weapon."

"The emergence of a black market for SNM makes the threat of nuclear proliferation far more urgent."

The semiconductor material in the devices works as a detector by creating a charge pulse when struck by a radioactive particle. Under an applied electric field, the pulse is transported to an external circuit and registered. Leading materials for room-temperature X-ray and gamma-ray spectrometers are cadmium zinc telluride (CZT), mercuric iodide, cadmium telluride, and gallium arsenide (GaAs).

"We now have new compact gamma-ray spectrometers based on CZT crystals that are capable of screening radioactive sources," Ralph says. "The challenge for Sandia is to increase the active volume of the devices without compromising the high energy resolutions."

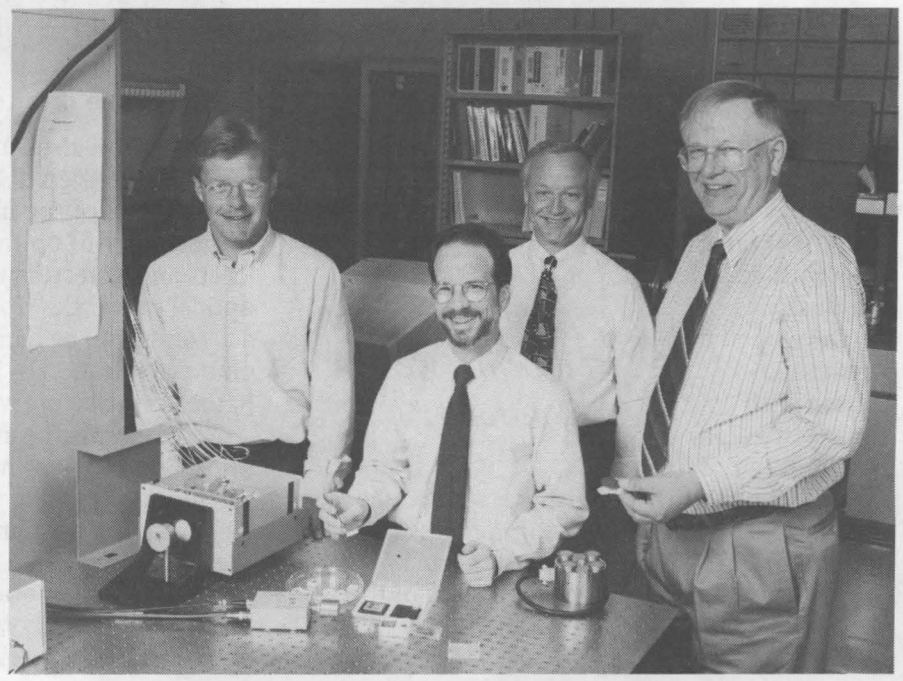
Al West, Director of Integrated Manufacturing Systems Center 8200, in which Ralph

(Continued on next page)

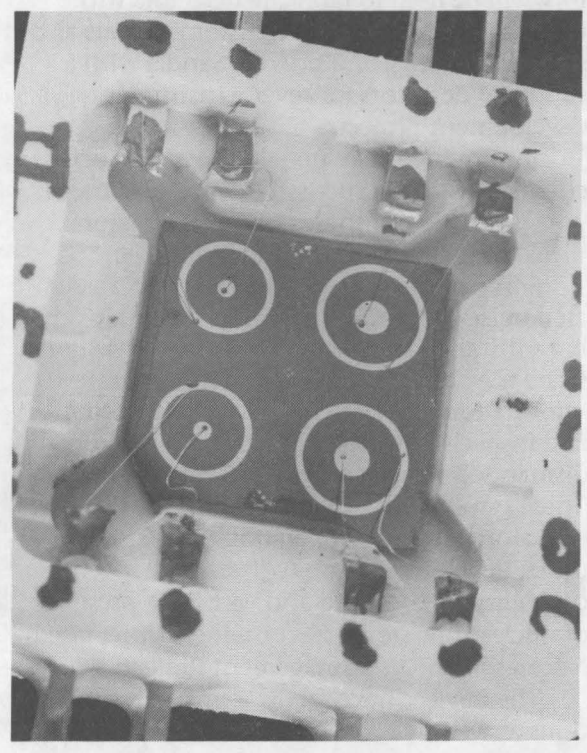
Medical imaging applications possible too

The compact gamma-ray devices under development at Sandia have medical imaging applications as well. Surgeons could use a miniature gamma camera weighing 40 pounds to image radio-labeled tumors during surgery. The compact gamma-ray camera is capable of intrinsic spatial resolutions as small as 1 mm, a factor of five improvement compared to conventional medical imaging instruments. The new camera can also be used to locate small subclinical tumors during intraoperative diagnostic tests, not possible by any medical instrument available today.

Currently, tumors are imaged with cameras that weigh about 1,000 pounds and are used only prior to surgery. The detector head under development at Sandia has been designed to support interchangeable probes for many applications, such as the detection of tumors of the brain, lung, thyroid, or colon. The probes may also be used in removal of benign bone lesions and in nuclear cardiology.



SENSORS AND SENSIBILITIES — Jim Lund, Douglas McGregor, Ralph James, and Richard Olsen of Advanced Electronics Manufacturing Technologies Dept. 8250 display such devices as the front end of a gamma camera, a gamma spectrometer, and a Straight-Line sensor pack.



SMALL ARRAY of four radiation detectors on a microchip was fabricated at Sandia's Compound Semiconductor Research Laboratory in Albuquerque with assistance from Depts. 1321 and 1322 in a collaboration with the Naval Research Laboratory. Made of gallium arsenide, it can detect low-energy gamma and X-rays.

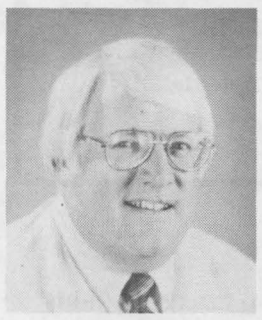
Partners, sponsors, participants

Sandia's research program in compact X-ray and gamma-ray sensors involves partnerships with academia and industry. Active cooperative research and development agreements (CRADAs) include four small, high-technology businesses: TN Technologies, Xsirius, Radiation Monitoring Devices, and DigiRad (a fifth CRADA has been concluded with Detectronics). The work also supports one or more graduate students at six universities: University of California, Los Angeles; Carnegie Mellon; University of New Mexico; Fisk University; University of Nebraska; and University of Illinois.

Sources of funding include Laboratory Directed Research and Development, DOE (Nuclear Nonproliferation office, Technology Transfer Initiatives-Defense Programs, Environmental Monitoring, Energy Research, and Basic Energy Sciences), intelligence agencies, and NASA.

Besides Ralph James, others working on the sensor development projects at least half-time at Sandia are: Jim Lund, Douglas McGregor, Richard Olsen, John Van Scyoc, Haim Hermon, Michael Schieber, Eilene Cross, Jeff Markakis, Hojun Yoon, Jim Toney, John Weeks (all 8250), Dick Anderson (8716), Arlyn Antolak (8715), and Ed Soria (8713). Art Pontau (8801), Rick Stulen (8250), John Vitko (8102), Greg Thomas (8111), Patricia Gingrich (5905), and Bob Ewing (5914) have helped coordinate technical tasks or worked with potential customers and users. Other Sandia organizations represented include 1235, 1322, 1341, 1811, 2204, 2271, 2338, 5914, 5922, 8111, and 9363.

Employee death



JERRY HENDERSON

Jerry Henderson of Space Programs Dept. 8115 died May 13. He was 52 years old.

Jerry was a Senior Member of the Technical Staff and had been with Sandia since 1964.

He is survived by his wife, Paula; two daughters, Pamela Henderson and Sharon Henderson-Waldbusser; a granddaughter; his mother; and one brother.

Simple method monitors thin-film stress to improve electronic, magnetic, optical devices

By Neal Singer
Lab News Staff

Using a low-power laser similar to those at supermarket checkout counters and a half-dollar-sized piece of specially coated optical glass, a simple, reliable method to determine stresses in very thin films of materials used in advanced electronic, optical, and magnetic devices has been developed by Sandia scientists.

Thin films and their support structures are critical components of CD-ROMs, semiconductor chips, computer hard drives, and telecommunication devices.

"Stress can be harmful or useful, depending on the application — but in either case, we need to measure it before we can control it."

Sandia is applying for a patent on the inexpensive technology and licensing it on a nonexclusive basis to industry.

Developed by physicist Eric Chason with colleague Jerry Floro (both 1112), the method, though highly sensitive, is impervious to vibrations caused by thin-film processing equipment or the rumble of passing trucks. They presented it at the spring meeting of the Materials Research Society in San Francisco in April.

From a single laser beam, the coated glass creates an array of parallel beams aligned like the teeth on a comb. By monitoring small deflections of the beams after they bounce off a target, its warp and hence its stress can be measured.

The new capability makes it possible for researchers to measure stress as it builds in a noisy environment rather than interrupt the process to remove the product for off-line analysis.

Stresses develop during production due to, for example, different rates of contraction between films and support materials during cooling.

To measure it is to control it

Thin-film stress may cause cracking, buckling, or even delamination, limiting applications of the film. Yet some stress may be necessary to optimize performance — in lasers and detectors with precisely controlled optical properties, for example.

"Stress can be harmful or useful, depending on the application — but in either case, we need to measure it before we can control it," says Eric.

To calibrate the amount of stress in thin films, Eric and Jerry monitor the curvature of the supporting material to determine its warp while varying the temperature or thickness of the film.

By beaming a one-half milliwatt laser into an angled, partially reflective mirror coated on both sides, the researchers create a series of internal reflections that emerge as parallel beams of light. The beams are directed into the process chamber and onto the material surface over a region of about one centimeter. The spacing between reflections of the beams is monitored electronically using a simple video camera.

Distortions in the material as small as one-hundredth of a micron — a micron is about the size of a bacterium — can be measured by the change in distance between the reflected beams. The changing distance becomes a continuous measure of warpage and thus, stress.

Instrument jiggle never appears in the readings because the rigid connection between laser and mirror causes all the beams to move together.

Earlier methods scan a laser light sequentially at different points of the material and then measure the distance between reflections. Because the measurements are taken at different times, these methods are more vulnerable to vibrations.

Says Harvard physicist Frans Spaepen, "What Eric has done is to measure all the laser points simultaneously. By doing so, he removed a significant source of error."

In a further improvement, the Sandia researchers place a second partially reflective mirror rotated at right angles to the first. This piggyback arrangement creates a square array of beams from the single source, making possible simultaneous measurement over a square area rather than just along a line, and allowing analysis of shapes as complex as those on a potato chip.

(Continued from preceding page)

works, says that in general the diverse radiation sensor program is "incredibly successful. In terms of markets, there's a huge market for it. To be able to do this at room temperature just opens up all kinds of things you couldn't do easily before."

A new fabrication laboratory for producing radiation sensors opened in April at the Chemical and Radiation Detection Laboratory (Bldg. 968) at Sandia/California as part of the designated radiation sensor user facility. This laboratory will be used to fabricate detectors with unusual geometries, make custom crystals and graded detectors, and provide Sandia with a supply of detectors for several instrument-development projects.

Improving the material properties, such as chemical purity, structural quality, and transport properties, of these crystals is a major thrust of the radiation sensor team.

Some of the sensors and their novel associated pulse-processing electronics have already been installed as radiation counters to demonstrate the ability to collect and disseminate information associated with the safe, secure, and inspected storage of nuclear "pits" from dismantled weapons (Project Straight-Line). These systems have been designed for five years of maintenance-free operation. New systems under development use CZT sensors' spectral capability to safeguard and verify the presence of nuclear pits stored in containers (Integrated Nuclear Materials Management Project).

The devices have medical imaging applications as well (see "Medical imaging applications possible too" on page 3).

Monitoring contents of waste drums

The new, smaller cameras can also monitor gamma-ray sources in the field. DOE, for instance, would like to characterize 55-gallon radioactive waste containers to ensure that the contents aren't leaking and, in some cases, to determine what is inside (without performing detailed laboratory analyses or generating secondary wastes). DOE has roughly one million such containers. A modified version of the imaging system for 55-gallon containers will be designed for *in-situ* characterization of the composition of radioactive wastes in more than 300 large underground high-level storage tanks.

Meanwhile, members of Ralph's team have worked jointly with industry and academia to create a portable detector that can quantify toxic elements in the environment (e.g., lead in paint) and conduct detailed elemental analysis of unknown materials via X-ray fluorescence spectroscopy.

Compact neutron sensors

A new area of development is the creation of compact, solid-state neutron sensors and neutron imaging arrays. The group has fabricated and demonstrated the first CZT neutron sensor and the first radiation-hard GaAs thermal neutron imaging array (designed to discriminate between neutrons and background gamma rays). Although the devices were originally intended for use in neutron radiography, they can also be used to detect or monitor radioactive isotopes, such as plutonium, which emit both gamma rays and neutrons. Since background neutron radiation is relatively low and uniform, detecting both neutron and gamma emissions simultaneously could help searchers locate specific radionuclides that emit both types of radiation.

More futuristic applications include space probes for NASA to characterize solar emissions, gamma-ray bursts from galactic regions, and compositions of extraterrestrial bodies; baggage scanners for airport security systems; radiation detectors to monitor exposure of emergency response workers (such as firefighters); and field instruments for detecting unexploded ordnance.

Solar Two dedicated

Solar Two, a large pilot solar plant capable of producing 10 megawatts of electricity — enough to supply 10,000 homes — was dedicated Wednesday, June 5, in the Mojave Desert near Barstow, Calif.

Engineers at Sandia played a key role in developing and testing molten-salt technology, used in Solar Two to capture and store the sun's heat. Sandia also conducted large-scale experiments at its Central Receiver Test Facility on the components needed in a molten-salt system. Sandia will continue to support the project through the remaining phases of startup, test and evaluation, and operation.

DOE Secretary Hazel O'Leary presided over the dedication ceremony, and many Sandia engineers who worked on the project and Sandia upper management were on hand.

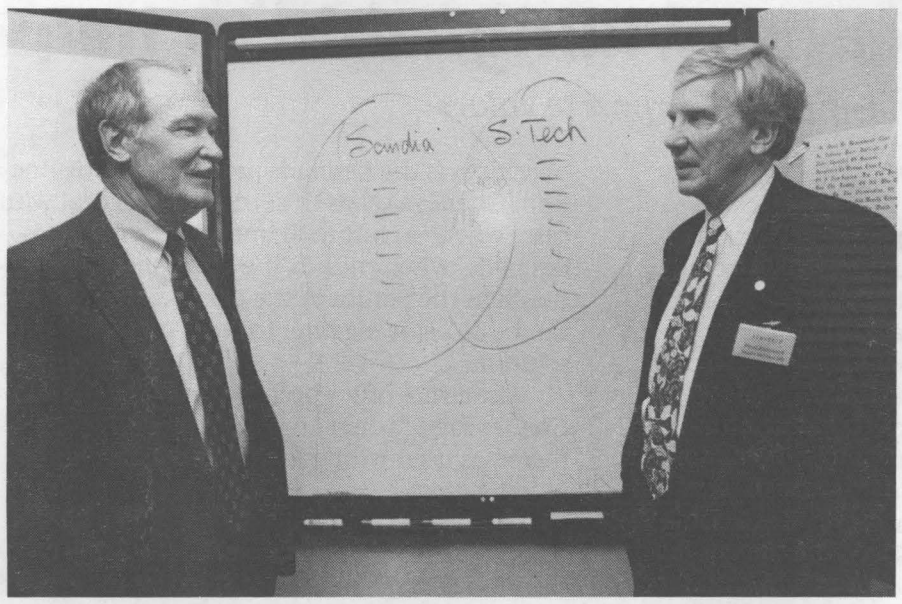
The project is sponsored by the Solar Two Consortium, a group of 10 organizations led by Southern California Edison Company, in partnership with DOE. We'll have photos and more details in our next issue.

Sympathy

To Kip Stanley (5800) on the death of his father in Aptos, Calif., April 30.

To James Ortega (10203) on the death of his brother, Matthew Ortega, in Espanola, May 19.

To Anna Trujillo (1400) on the death of her son, Richard Lawrence Trujillo, in Belen, May 27.



SEMATECH President William "Bill" Spencer, left, talks with Sandia President and Laboratory Director C. Paul Robinson about the close ties between the two institutions that have contributed to turning around the US microelectronics industry. (Photo by Mario Gonzalez, SEMATECH)

Semiconductor

(Continued from page 1)

qualify it as an ideal research partner for SEMATECH. Those qualifications include having a wide range of technical expertise capable of solving almost any research and development and engineering problem, manufacturing and production experience obtained by being responsible for the entire system design and manufacturing for nuclear weapons, state-of-the-art microelectronics facilities like no others belonging to the US government, and years of experience in process modeling and reliability analysis.

One of the enabling facilities for the research is Sandia's Microelectronics Development Laboratory (MDL), a world-class microelectronics prototyping facility containing state-of-the-art integrated circuit fabrication equipment. With 74,000 square feet, the MDL includes offices, laboratories, and 30,000 square feet of clean-room space with 12,500 square feet of Class 1 clean space in 22 separate clean rooms.

Using the MDL facilities and equipment, Sandia scientists and engineers have completed a variety of projects with SEMATECH. These have included equipment benchmarking and evaluation, reliability analysis, ergonomics, software quality improvement, manufacturing materials development, computer simulation and modeling, and control system design.

SEMATECH's Spencer has praised Sandia's work to Congress, in 1993 telling members of the Energy Subcommittee of the US House Committee on Science, Space, and Technology that Sandia's modeling expertise had allowed SEMATECH to save "a tremendous amount of time and money" in designing vertical furnaces.

In another project, Spencer said, Sandia accomplished an extensive failure analysis of a pressurized sulfuric acid tank in less than two months. "Our member companies and the rest of the industry were made aware of the findings and an inspection procedure was recommended," he said.

A neutral site for benchmarking

Spencer also cited Sandia's benchmarking of foreign semiconductor manufacturing equipment, which enabled US manufacturers to improve their products and consequently their positions in the world market.

Equipment benchmarking is accomplished in the MDL by adding custom diagnostic instrumentation to the equipment. The instruments record and map internal operating conditions. Computer-controlled data acquisition systems record each detail of the machine's operation. Once the equipment is installed, several evaluations are performed, such as process optimization and rigorous testing in a simulated production environment.

Chuck says Sandia offers a neutral and easily accessible evaluation site for benchmarking. His assessment is backed up by the SEMATECH Executive Technical Advisory Board (ETAB), which has called Sandia's benchmarking work "outstanding" and "a model for the way this activity should be done in the future."

The ETAB also praised Sandia's Contamination-free Manufacturing Research Center, established in 1993 to solve defect problems associated with larger die and smaller feature sizes and managed by Bob Blewer (1305). Universities, equipment suppliers, other national labs, and SEMATECH member companies conduct research at the center into the formation, transport, adhesion, detection, and removal of contaminants in advanced equipment and processes. The initial activities focus on modeling contamination in chemical vapor deposition (CVD) reactors, sensor development, mini and micro environments, and wafer cleaning. Underlying issues are cost of ownership improvements, contamination impact on circuits, and ultraclean processing.

The research will eventually support circuit feature sizes as small as 0.1 micron and removal of contamination 10 times smaller.

"Finding these contaminants on an 8-inch wafer is somewhat akin to finding a golf ball in an area the size of Rhode Island," Bob says.

Specific CFM projects include modeling the creation, transport, adhesion, and removal of particles from wafers or equipment surfaces, developing low-cost sensors to detect particles, moisture, and corrosive gases; evaluating contaminants in the wafer manufacturing environment; and developing improved methods for removing contaminants from wafers.

Technologies of contamination detection have already been transferred to industry, as have methods for reducing the concentration of acids used in chip manufacture.

Modeling equipment and processes

Another large program area has focused on process and equipment modeling. Such modeling has supported the design of low-pressure chemical vapor deposition (LPCVD), rapid thermal processing (RTP), and plasma-enhanced deposition and etching reactors. The modeling objective is to describe the detailed atomic and chemical interactions occurring on the wafer surface and the resulting surface topology based on reactor control parameters.

The LPCVD reactor models have been used to design all portions of a furnace and to develop an optimized furnace controller that provided more than a 50 percent improvement in furnace operation.

"The improved furnace throughput and wafer-temperature uniformity have the potential of providing the largest return on investment of any project the Sandia/SEMATECH partnership has sponsored," Chuck says.

Other models are being developed to simulate low- and high-density plasma and rapid thermal processes and equipment. Using modeling in the design phase shortens the time to market and decreases production costs.

The semiconductor industry has access to Sandia's modeling and design software through Sandia's Equipment Improvement Center (EIC).

Cost benefits and industry leverage

Capabilities in modeling, failure analysis, and equipment design developed for Sandia's nuclear weapons work have proved useful in many key areas of commercial semiconductor wafer fabrication, but the research also supports DOE's required core competency in microelectronics, says John McBrayer (1302). He says the microelectronics competencies will be needed for future weapons systems. John joined Chuck Gwyn in December 1993 to help bring improved comprehensive technical managment techniques to the SEMATECH program.

"Sandia and DOE also have received major cost benefits and industry leverage through cooperation with the SEMATECH companies," John says.

As an example, he cites fabrication equipment donations from industry to the Microelectronics Development Laboratory (MDL) worth more than $35 million and early access to circuit-making processes on pre-commercial tools at integrated-circuit and equipment companies. The MDL has had access to the best practices and minds of the US chip industry.

Thirty-four Sandia/SEMATECH projects under way

Sandia and SEMATECH are cooperating in 34 active projects. The projects are matrixed across the Labs to access expertise needed for specific problems.

"During 1995, more than 230 Sandians from approximately 50 organizations in Livermore and Albuquerque worked on some aspect of the program," says Chuck Gwyn, coordinator of Sandia's work with SEMATECH. "The program size has mandated the use of comprehensive program management methods to support project planning, resource allocation, and help assure our customers that we can meet the project objectives, on time and within budget," Chuck says.

For the last three years, Sandia and SEMATECH have been using the National Semiconductor Technology Roadmap to help select projects. The roadmap is a set of guidelines developed by the US semiconductor industry to define processes and equipment needed to keep this country's integrated chip industry competitive internationally over the next 15 years. The CRADAs Sandia has implemented with SEMATECH in response to industry requirements include projects studying a broad range of semiconductor production needs, as well as projects to bring specific technologies to market.

Labs' new ethics officer is ready, willing, able to help

Charles Tapp says position encourages behaviors consistent with Labs' corporate values

When he started his new job in early April, Charles Tapp was a bit dismayed to find himself saying "no" so often. As Sandia's new ethics officer and Director of Corporate Ethics Center 12700, Charles found that practically every time he was called for an opinion on whether a particular activity is ethical, he had to say no.

"At first, it bothered me," Charles says. It seemed that every Sandian he talked to, Charles says, was proposing something of at least questionable ethics.

"Then it occurred to me," Charles adds, "that the only time anyone will call is if they are already inclined to think there's a potential ethics problem. Now, I'm coming to appreciate the fact that Sandians are concerned enough about ethics issues to initiate a call and ask for an opinion, even if it's a negative one.

"Being in this position is sort of like having teenagers: You say 'no' a lot."

Charles, who sees his position as adding value to the company by encouraging ethical behavior and by addressing and attempting to resolve problems before they become issues for litigation, says his number-one priority at this stage is to "get the word out that I'm here. If the [ethics] position isn't known, it doesn't have much value."

Anyone — employees, contractors, vendors, stakeholders, Californian, or New Mexican — who feels unfairly treated or who believes unethical conduct is occurring can and should call the ethics office, Charles says.

A 'good feel' for Sandia's expectations

A 32-year veteran of Sandia, Charles holds a PhD in physics as well as an undergraduate degree in philosophy. He has had formal ethics training and has team-taught a graduate-level ethics course — "Business and Society" — at New Mexico State University.

"We have a set of values here that has evolved over the years. As such, you want someone [in this position] who is senior, who's been around, who has a lot of experience in Sandia's expectations of its employees. I think I have a pretty good feel for what the Sandia society expects of its people."

Charles says he sees the ethics role as having proactive and reactive components. On the proactive side, he is responsible for the Labs' mandatory annual ethics training program and for providing counsel to Sandians with questions about ethics. On the reactive side, he conducts investigations into allegations of wrongdoing that have an ethical component.

This year, he says, Sandia's education and training organizations in Human Resources Center 3500 will administer the ethics training.

The required ethics training, Charles acknowledges, was a source of some frustration for many Sandians in its first year. Not that there was anything wrong with the training, Charles says; rather, the training, which was tailored for a Lockheed Martin corporate audience, was deemed by many Sandians to be not particularly relevant to the kinds of issues that arise in a national laboratory. Sandians should see a more effective and relevant 1996 program, Charles says, when it is rolled out this summer: Sandia/California Ombud Geri Albright served on the Lockheed Martin team that designed the new program, and she has extensive experience in dealing with Sandians' ethical concerns.

Office works closely with ombuds

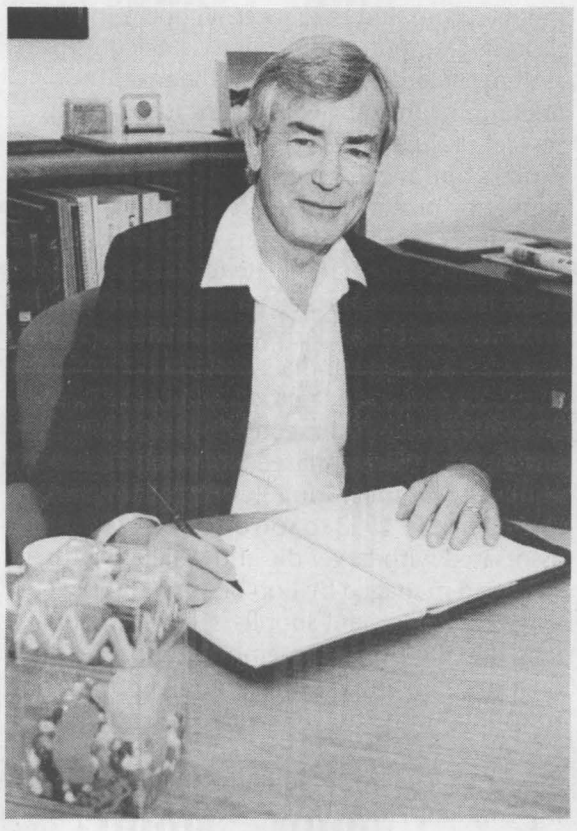
Charles says the ethics officer position, established two years ago, is one of the key ways Sandia attempts to ensure that individuals are treated fairly and consistent with corporate values. Another program with similar objectives is the Ombuds program. The distinction, Charles says, is this: the ombuds deal with cases where an informal, mediated solution is desirable, when there is the hope and expectation that the parties in the dispute or conflict can be brought together to work out a win/win solution.

The ethics office becomes involved, Charles says, "when an individual is convinced there has been wrongdoing and they want an investigation.

"My cases begin with an expression of concern," Charles explains. "As the ethics officer, I then use Labs resources — security, audit, labor relations, human resources — to conduct an investigation in which I determine the facts of a case. I turn those data over to the responsible line organization for action.

"I'm not an enforcement officer. I don't fire people and I don't discipline people; that's the line's role; I provide the line the information I learn from my investigation.

"I'm not a policing organization. I don't go looking for violations. I deal with problems that are brought to my attention. My job is to see that a fair and full investigation is conducted so that the line organization can act in the appropriate way."



CHARLES TAPP

Sandians have a number of avenues to address ethics concerns

Most answers to ethics questions and concerns, says Charles Tapp, can be found in Sandia's *Code of Ethics and Standards of Conduct* document, or in the Lockheed Martin *Setting the Standard: Code of Ethics and Business Conduct* document distributed to all employees during the mandatory ethics training program.

When instances of potential wrongdoing or unethical conduct do arise, Charles encourages Labs employees to try to resolve the issue by dealing first with Sandia's internal resources. He adds, though, that DOE and Lockheed Martin also have established ethics offices to deal with concerns that are not — or cannot be — adequately addressed at the more local level. Here are some of the contact numbers for Sandians with ethics concerns:

Sandia Ethics Hotline: (505) 844-1744
Sandia Ethics Officer: Charles Tapp — (505) 844-2277
Sandia California Ombud: Geri Albright — (510) 294-2065
Sandia/New Mexico Ombuds: Wendell Jones — (505) 845-8301; Armando Castorena — (505) 844-2145
Lockheed Martin Sector Ethics Office: John Bigelow — (505) 843-4032
Lockheed Martin Ethics Hotline: 1-800-LM ETHIC (1-800-563-8442)
DOE Hotline: 1-800-541-1625

New ethics officer aims to speed up resolution of inquiries

As Sandia's new ethics officer, Charles Tapp says he has found the job to be "quite demanding and quite a bit busier" than he expected.

"Since I've been here," he says, "we've opened, on average, more than one case a day. Most are fairly straightforward to resolve, but some require extensive investigation. In all cases, we want to reduce our cycle time. Company policy says we should satisfy all ethics concerns within 120 days of the time they are brought to our attention. I intend to try to do a lot better."

Charles says that since assuming the ethics position, he has found that budget uncertainties and job security concerns are creating some very real ethics concerns.

"We have some serious problems at Sandia," Charles says. "Shrinking budgets create unhappy folks and put stress on people. It's important for all of us to remember to deal with that stress in a manner consistent with our company values. We mustn't let that stress drive us to mental or physical abuse of coworkers or managers. We all need to be sensitive to early suggestions of potential mental, emotional, or physical violence in the workplace and take appropriate actions." Those "appropriate actions," Charles says, may involve discussing concerns with a manager, an Ombud, or the ethics office.

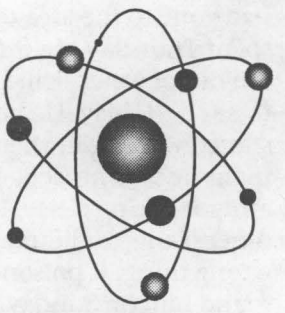
In another area of concern, Charles says it is important for Sandians to remember that "e-mail, the Internet, the World Wide Web — these are technical tools intended to help us do our jobs better; they are not toys to be played with during working hours."

Nuclear weapons will play a significantly altered role in post-Cold War strategic calculations, professor says

Age of 'classical deterrence' is over, colloquium speaker argues

By Bill Murphy

Lab News Staff



The Cold War world in which nuclear weapons played a "classical" deterrent role is gone, according to internationally recognized strategic thinker Michael Mandelbaum. "We really are in a different world," he says.

That does not mean, he told Sandians recently, that there is no place for nuclear weapons in US foreign policy planning. There is. But the role of nuclear weapons will be different than during the Cold War's clearly defined, bipolar political alignment, Mandelbaum says.

Mandelbaum, the Christian A. Herter Professor and Director of American Foreign Policy at the Johns Hopkins School of Advanced International Studies, gave a colloquium on "Nuclear Weapons and American Foreign Policy in the Post-Cold War World." Mandelbaum was hosted by Rob Rinne, Manager and Senior Advisor for National Security Dept. 8104. Rob says the colloquium series is intended to provide Sandians with insights about emerging strategic issues.

"There are those who believe that with slight adjustments, we can carry on with business as usual as we did in the past," Rob says. ". . . [this is] a failure to recognize the truly significant changes that have occurred in the world over the past five years. The international order has seen a major discontinuity, a jump into a new setting in which we, as yet, have little insight on how to set the priorities of our own efforts." The colloquium series, he says, aims to augment that insight.

Mandelbaum asks: "What role can — will — should — nuclear weapons play in the new world?" In answer, he says there are three groups of countries for which US nuclear weapons remain relevant, "but not as directly relevant as was the case during the Cold War era."

The three groups are:

• **Our Cold War adversaries**, Russia and China. While these nations are no longer our adversaries, and need not become adversaries, Mandelbaum says, both harbor potential irredentist ambitions — in the Ukraine, the Baltic States, and Taiwan. "The Russian-Ukrainian border and the Taiwan Strait are, in my view," Mandelbaum says, "the most dangerous, potentially most explosive places in the world today." The US, he says, has a "heavy stake" in forestalling potential Russian and Chinese ambitions in these arenas. The continued existence of US nuclear weapons can and will be a factor in checking these ambitions. US nuclear weapons in this context serve in the capacity of a "tacit deterrent, a deterrent at one remove" to unbridled adventurism.

• **Our Cold War allies**, specifically Germany and Japan. In each case, Mandelbaum says, there is a domestic political interest in retaining a US nuclear umbrella, even absent the kind of direct nuclear threat that prevailed during the Cold War. Without that umbrella, each would find itself at a distinct disadvantage in dealing with their larger, nuclear-armed neighbors (Russia and China). In the absence of a US nuclear umbrella, he says, both might find themselves forced, for purely defensive reasons, to join the nuclear club, a course neither really wants to pursue. Thus, in the case of these nations, the US arsenal plays a role not of deterrence but of reassurance. Not coincidentally, an American umbrella over these countries also reassures Russia and China that they will not have to reckon with a nuclear-armed Germany or Japan.

• **Rogue states** that seek nuclear weapons to pursue goals inimical to the interests of the US. The US policy goal regarding rogue states' acquisition of nuclear weapons should be denial rather than deterrence, Mandelbaum says. The failure of a denial policy would have immediate repercussions: (a) The US might be drawn into a policy of explicit deterrence; (b) There would be increased political pressure in the US to develop a viable antimissile defense system; and, (c) There would be pressure for a policy of preemption-by-force of rogue states' nuclear capabilities.

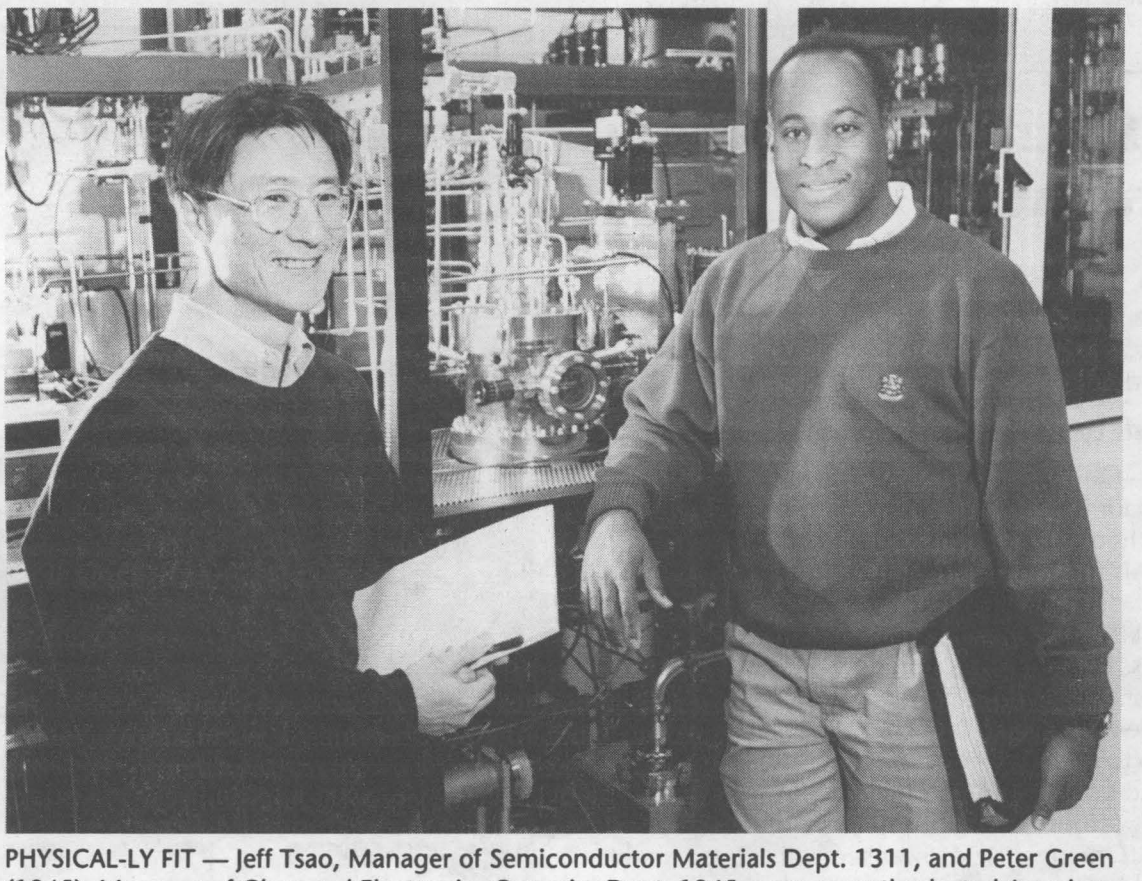
"There are those who believe that with slight adjustments, we can carry on with business as usual as we did in the past. . . ."

Mandelbaum says there are at least two conclusions to be drawn regarding the implications for the US nuclear weapons program in the post-Cold War world.

First, in the post-Cold War era, the US will need a nuclear arsenal, but it is unlikely that policy makers in Washington will conclude that the arsenal need be as large as it was during the era of classical deterrence, i.e., the Cold War.

Second, given the tasks the US military is likely to face, "the frontiers of military technology — from the demand side — involve missions of detection and accuracy and both of these depend, of course, on information processing. As it happens, this [information processing] seems to be the cutting edge of innovation in military technology from the supply side as well. There is, then, a nice coincidence between the kinds of technology that post-Cold War military missions will seem to require and the kinds of technology that seem to be the most promising, that seem to be developing the most rapidly.

"As for nuclear weapons themselves," Mandelbaum concludes, "they would seem to be less important — considerably less important — in the future than they were during the Cold War."



PHYSICAL-LY FIT — Jeff Tsao, Manager of Semiconductor Materials Dept. 1311, and Peter Green (1845), Manager of Glass and Electronics Ceramics Dept. 1845, were recently elected American Physical Society (APS) Fellows. Jeff was named an APS Fellow by the Materials Physics Division for "fundamental contributions to the thin film and surface science underlying semiconductor epitaxy and processing." He has a PhD in applied physics and has been at Sandia since 1984. Peter was named an APS Fellow by the High Polymer Physics Division for "significant contributions to the understanding of the dynamics of block copolymer, homopolymer melts, and polymer blends and to the behavior of block copolymers near surfaces." He has a PhD in materials science and has been at Sandia since 1985. Each year, no more than one-half of one percent of the current membership of the APS are recognized by their peers for election to the status of Fellow in the American Physical Society, an organization of more than 41,000 physicists worldwide.

(Photo by Mark Poulsen)

Congratulations

To Patricia and James (5731) Klarkowski, a son, Patrick Michael, March 15.

To Esther (10217) and Mark Hernandez, a daughter, Adriana Gabrielle, April 11.

To Terri and David (2314) Cocain, a son, Michael Robert, April 13.

To Dee Greer (7615) and Charles Doyle, married in Albuquerque, May 11.

To Patricia (1274) and Randy (2338) Smith, a son, Nathan Kyle, May 22.

Found wallet leads rescuers to man lost in the desert

Snake eyes and blind luck

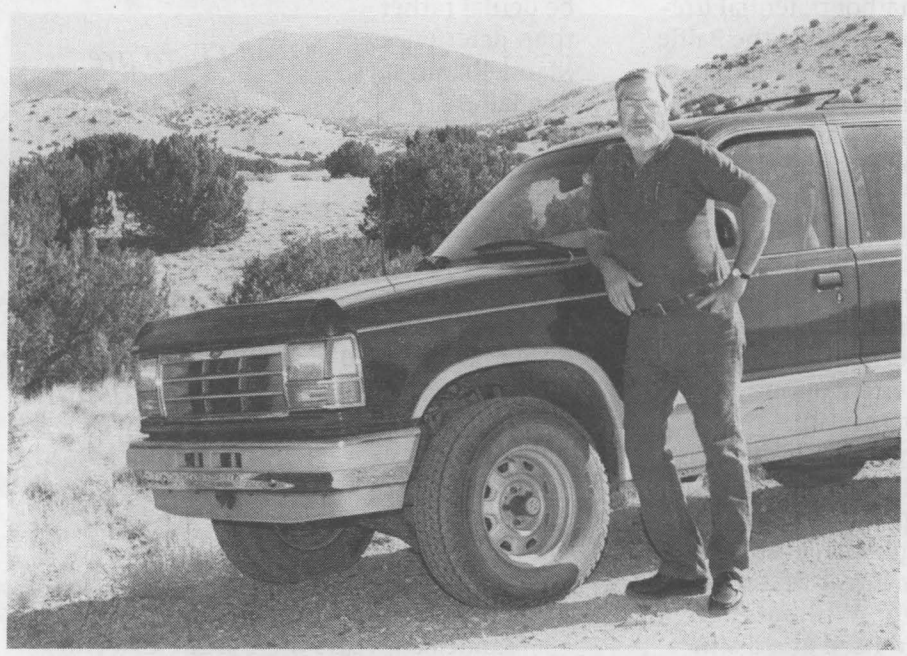
By Janet Carpenter

Lab News Staff

In many ways, a Santa Fe man is a lucky fellow indeed. If Jerry Ward, Print Media Dept. 12615, and his son Keith had driven a Mustang instead of an Explorer the night before Mother's Day, they would have stayed on the road and not driven along an arroyo. If they hadn't driven along the arroyo, they would not have found a man's wallet, jacket, and notebook.

Jerry and Keith went out the evening of May 11 to study snakes along the Quebradas Back Country Bi-Way east of Socorro. Around 10 p.m., they left the road and drove along an arroyo. Keith noticed something along the slope, and they pulled over to investigate. Finding a man's wallet, scientific notebook, a map, and a camouflage jacket, they suspected someone had met with foul play. Using flashlights, they explored the area for half an hour without finding anyone. Because the ground was hard and rocky, they didn't see any footprints. Feeling there was something wrong but unable to find more clues, they left the spot and continued their snake hunt. The night turned up one diamondback rattler, which they photographed before heading home.

The next morning, Jerry looked through the wallet and learned who owned it. He called the person's home in Santa Fe and reached the owner's wife. She called the New Mexico State Police to report that her husband's belongings had been found. Meanwhile, Jerry took the objects to the State Police office in Albuquerque. He was able to pinpoint the location where he'd found them because he had checked his mileage on that trip regularly and knew where they had left the road and how far it was to the arroyo. He drew a map for the police. Within an hour, rescuers were able to find the man, delirious and near death, lying east of the arroyo not far from where Jerry and Keith had spotted his belongings. From the arroyo, police were able to track the man through other personal belongings he'd discarded as he wandered in the desert. They found other pieces of clothing and an empty canteen.



SNAKE SEEKERS Jerry Ward (12615) and son Keith (not pictured) wouldn't have found a wallet, notebook, and jacket on the side of an arroyo if they'd been driving Keith's Mustang instead of Jerry's Explorer. Their discovery saved the life of a man ill and lost in the desert east of Socorro.

The man had started his trip on Thursday and had been lost since Friday. He told Jerry he had gone to the area to look for fossils and spent Thursday night sleeping in his car. He ran out of water while hiking and looking for fossils on Friday. He became disoriented and started walking in the wrong direction. That night he says he slept out in the open in an arroyo. The next day, he tried eating cactus and other plants for liquid and apparently ate the wrong thing. It poisoned him. When the police found him on Sunday, he was so ill and confused that he resisted the rescuers, not knowing who they were. He was taken to a Socorro hospital, where he spent Sunday and Monday. He was then transferred to University of New Mexico Hospital and was hospitalized until the following Friday.

"It's a case of snake eyes and blind luck," says Jerry. "We happened to be in the right place at the right time. It's not a place to go to alone."

Learn during National Safety Month how to avoid becoming a statistic

¡SALUD! and Sandia's Safety Engineering Dept. 7732 are sponsoring a variety of safety-awareness activities in June, National Safety Month, including safety action booths and weekly safety seminars. When you participate in any Safety Month activity, you will be entered into a drawing for prizes to be awarded at the end of the month. The National Safety Month theme, "How to Avoid Becoming a Statistic," was selected to emphasize the need for safety awareness in the workplace, home, and community.

Seatbelt 'stings'

Seatbelt "stings" will be conducted every Monday in June in Sandia parking lots. If you're wearing your seatbelt, you'll be given ¡SALUD! Bucks as a reward. Seatbelt stings will be held in the following parking lots between 11 a.m. and 1 p.m. on the dates indicated: south of the Technology Transfer Center (Bldg. 825) on June 10; across from Bldg. 887 on June 17; and in front of Area 4 Bldgs. 960/962 on June 24. Buckle up so you won't get "stung."

Action booths

Register for an end-of-the-month raffle of safety items and receive free educational materials at the following safety action booths to be set up on Thursdays, 11 a.m.-1 p.m.: Gates 1, 10, and C1 in Area 3 on June 13; Bldg. 800, Sandia Vista, and the Coronado Club on June 20; and the Area 1 Cafeteria (Bldg. 861), Research Park, and University Building on June 27.

Safety seminars

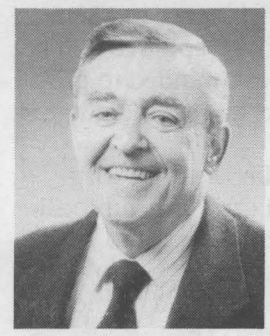
Call the SALUD office at 844-8238 to sign up for the following Wednesday safety seminars in June, 11:30 a.m.-12:30 p.m. each day in the ¡SALUD! Facility (MO-170) conference room.

"DWI Awareness," June 12 — Linda Atkinson, Director of DWI Resources, will discuss New Mexico's notoriety as the second-worst state in the nation for DWI accidents. She will also address what New Mexicans can do to protect themselves from impaired drivers and how we can become part of the solution.

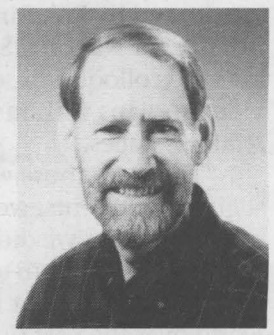
"Injury Prevention," June 19 — ¡SALUD! staff member Heidi Swanson will tell you about the leading causes of home accidents and how to prevent family members from encountering dangers in your home.

"Recreational Safety Panel," June 26 — Representatives from NM Search and Rescue and Sandia's Bicycle Commuters Group (SBCG) will describe 10 essential techniques for safely enjoying the wilderness and the three most important things to do before leaving on a trip. Bicycle safety issues, including mountain biking, will also be discussed.

Recent Retirees



Roger Thorp 25
15105



Ron Iman 20
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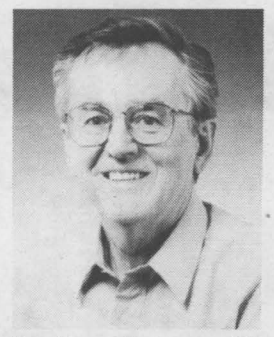

Jim Gerardo 30
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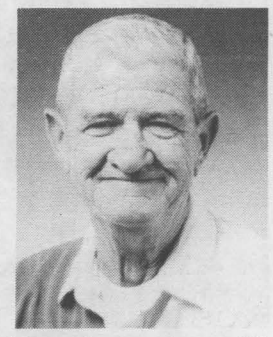
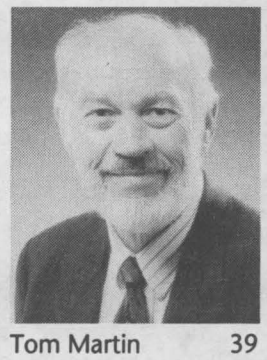


Tom Dragoo 30
12613



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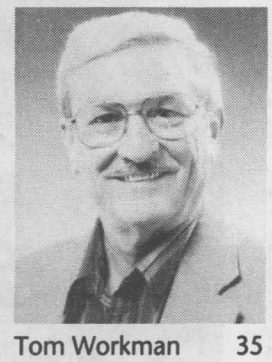

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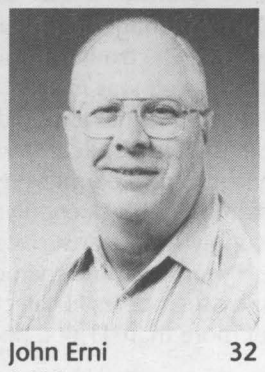

John Erni 32
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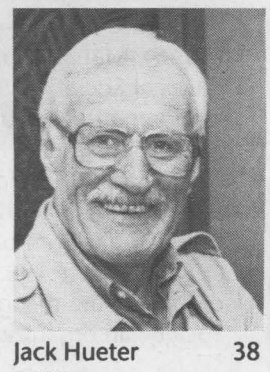


Jack Hueter 38
3521

Prescription Drug Program, Part 1: *Sandia's focused customer service unit*

This is the first article in a series concerning the Prescription Drug Program (PDP). The PDP is available to those participants enrolled in the Triple/Two Option Plan (TOP3/TOP2); however, covered TOP3/TOP2 participants who have primary coverage under another group health plan other than Medicare are not eligible to use the retail network pharmacy or Mail-Order Program benefit. These articles will give information on Sandia's newly implemented focused customer service unit, explain the benefits of the retail network pharmacy and Mail-Order Program benefits, and answer frequently asked questions. ***To reach Sandia's focused customer service unit, you must dial 1-800-833-4914.*** *Any other number will route you to one of Caremark's 300 general customer service representatives who are not as familiar with the Sandia plan.*

New focused customer service unit

Effective March 11, Caremark and Sandia launched a focused customer service unit to provide better service to employees and retirees. The team consists of 16 primary customer service representatives who have been trained in-depth on Sandia's Prescription Drug Program. These representatives are available to assist you with:

- Understanding the mail and retail benefits of the PDP
- Determining whether a medication is covered under the PDP
- Obtaining/completing Patient Profile/Mail-Order and Non-Network Reimbursement Prescription claim forms
- How to have your physician write a mail-order prescription accurately
- Determining the appropriate copayments for medications purchased by mail (i.e., is the drug generic or brand name)
- Explaining the generic and brand name substitution program by mail
- Determining the status of your mail-order purchase
- Selecting a retail network pharmacy in your area
- Understanding your Explanation of Benefits regarding a paper claim

The representatives are also available to assist your pharmacist with filling a prescription and electronically filing the claim with Caremark.

Caremark's phone menu options

Benefits Dept. 3343 has received many calls from participants who are confused with respect to Caremark's phone menu options or who have difficulty accessing the appropriate customer service personnel to assist with a question or problem. Although Sandia has a team of primary customer service representatives, they all have specialties they concentrate in (mail-order, paper claims, retail benefits) with access to different computer screens. This is why it is important that you select the right option.

First, dial 1-800-833-4914. If you have a touch-tone phone, you will be asked to press "1." If you don't have a touch-tone phone, stay on the line and you will automatically be routed to a customer service representative.

If you press "1," you may select from four options outlined below. Note: Currently, if you select an option and want to return to the main menu while in the selected option, you cannot do so. Due to customer feedback, Caremark is working on improving this process.

Press "1" to order a mail-order refill or to check on the status of your prescription order (fully automated option):

This option allows you to refill your mail-order prescription by providing the employee's/retiree's social security number, the prescription number, and credit card information. It also is the option to select when you need information about the status of an order. With the social security number, you can find whether your last order has been shipped.

Press "1" to order a refill, "2" to determine status of your order, and "3" to obtain information about this option.

Press "2" to order claim forms or to inquire about paper claims:

Select this option if you want to order Non-Network Reimbursement Prescription forms, inquire about the status of a paper claim, learn how to file a paper claim, or inquire about the non-network retail pharmacy benefits.

To order a Non-Network Reimbursement Prescription claim form, press "1." You will be asked to give the company name, the employee's/retiree's social security number, full name, daytime phone number, and complete mailing address. Claim forms will be sent to you within 10 to 14 days. If you need a claim form sooner, contact a customer service representative (see next paragraph). Note: To obtain a Patient Profile/Mail-Order form, select option "4" from the main menu.

To speak to a customer service representative about the status of a paper claim, filing of a paper claim, or the benefits available under the non-network retail pharmacy benefit option, press "2."

Press "3" to speak to a customer service representative to request assistance with the retail network pharmacy benefits or to have a pharmacist receive on-line assistance:

Select this option if you have questions about whether a pharmacy is a retail network pharmacy, to find a retail network pharmacy in your area, or to learn about the benefits. This is also the option your retail network pharmacist should select for assistance with filing a claim electronically.

Press "4" to speak to a customer service representative about the Mail-Order Program benefits or for assistance with an order:

Select this option to speak with a representative about the Mail-Order Program benefits, to inquire about drug copayment amounts, to ask whether a drug is a brand name or generic, to discuss the generic substitution program, or to find what drugs are covered under the Mail-Order Program.

If you have any questions about the Prescription Drug Program, contact Sandia's focused customer service unit at Caremark at 1-800-833-4914.

Roy Crumley's cactus thrives for 30 years in cul de sac behind Bldg. 800

Roy Crumley, left, Manager of Subcontract Administration and Support Services Dept. 10232, greets an old friend: a six-foot-in-diameter prickly pear cactus planted behind his old office in Bldg. 800 almost 30 years ago. The cactus, which started its life in the wilds of Area 3, has thrived in the sheltered environment of the cul de sac formed by the junction of Bldgs. 800, 801, and 802. In early May, the cactus was in full bloom when Roy came to see it for the first time in many years and to talk about how it came to be there.

Back in the late 1960s, it seems, Roy was working as a construction buyer out of the Purchasing Department in Bldg. 801. One day, he says, one of the guys working on a project in Area 3 came into his office holding a little cactus pad he'd dug up at the job site. " 'Hey Roy,' the guy says [as Roy tells it], 'where do you want your cactus plant?' 'Oh,' I said, 'just stick it out there behind the building.' So he did. It was all really just a joke at the time and I didn't think anything of it."

Indeed, Roy says he didn't give the cactus another thought for years. All that changed when someone, noting the stunningly beautiful blooms, told the *Lab News* about the cactus and said Roy was the man who planted it. That led to the reunion of the man and the cactus plant whose relationship started out as a construction-site gag.

"It's done pretty well, hasn't it?" Roy says now.

There's an ironic twist to this story: As the *Lab News* was setting up to photograph the cactus, a contractor working on the Power Systems Modernization (PSM) project called out: "You guys better get your pictures fast, 'cause we're digging that thing up next week." It turns out that the PSM engineering plans call for a junction box pad precisely where the cactus stands.

Although Roy admittedly hadn't given the cactus much thought in recent years, he still allows as how he would be sorry to see its demise.

"Now that I see how much it's grown, I sort of hate to see it go," he says.

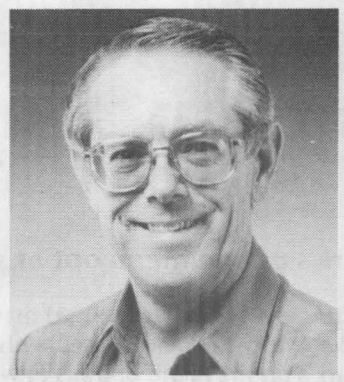
After making some phone calls, we thought the cactus had been saved — we were told it would be transplanted. But just as this issue was going to the printer, we saw the cactus being carried away in a dump truck. We'll update this story soon.

— Bill Murphy

(Photo by Mark Poulsen)

Mileposts

June 1996



Rod Geer 20
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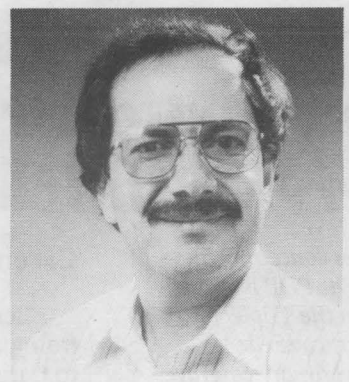

Anthony Montoya 15
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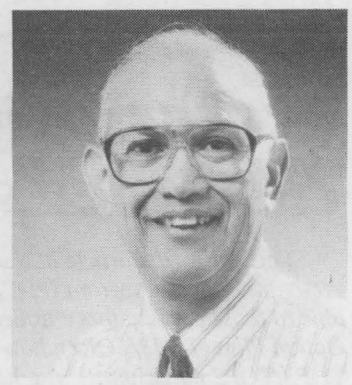

Ruben Urenda 35
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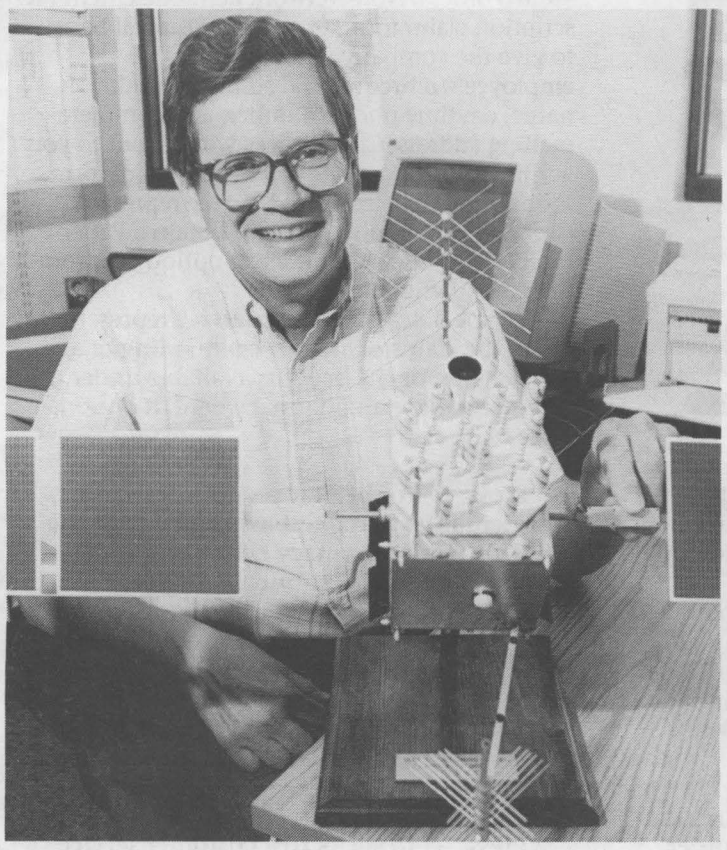

Paul Phipps 35
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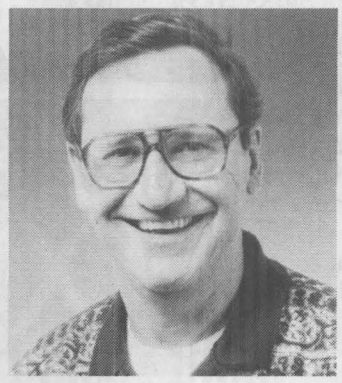

Jerry Hochrein 30
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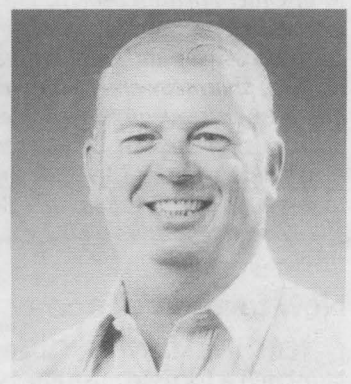
Rita Pitts 20
7909



Jerry Meloche 30
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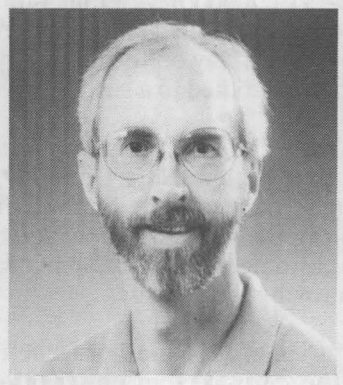

Jim Muntz 20
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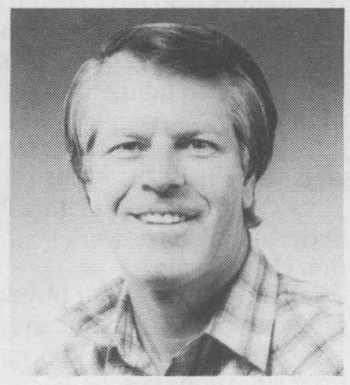
Beth Coleman 15
8305



Alan Smith 20
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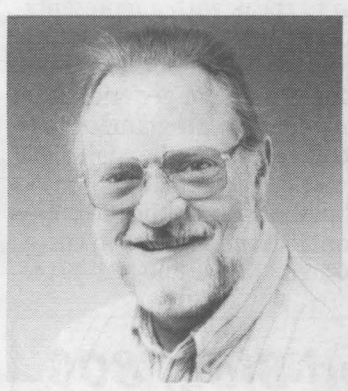

Andy Jones 20
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Fred Blottner 35
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Jennifer Simmons 15
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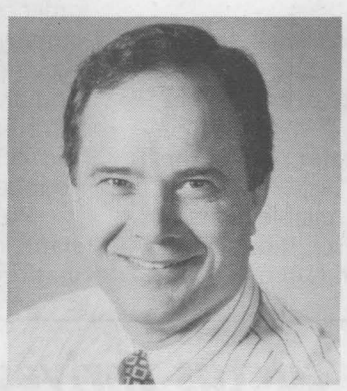

Dennis Siebers 20
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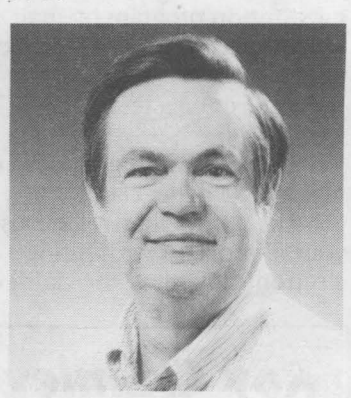

Cliff Wagner 20
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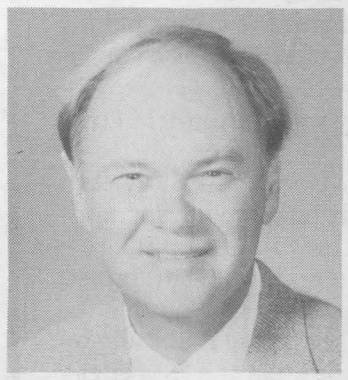

Linn Derickson 20
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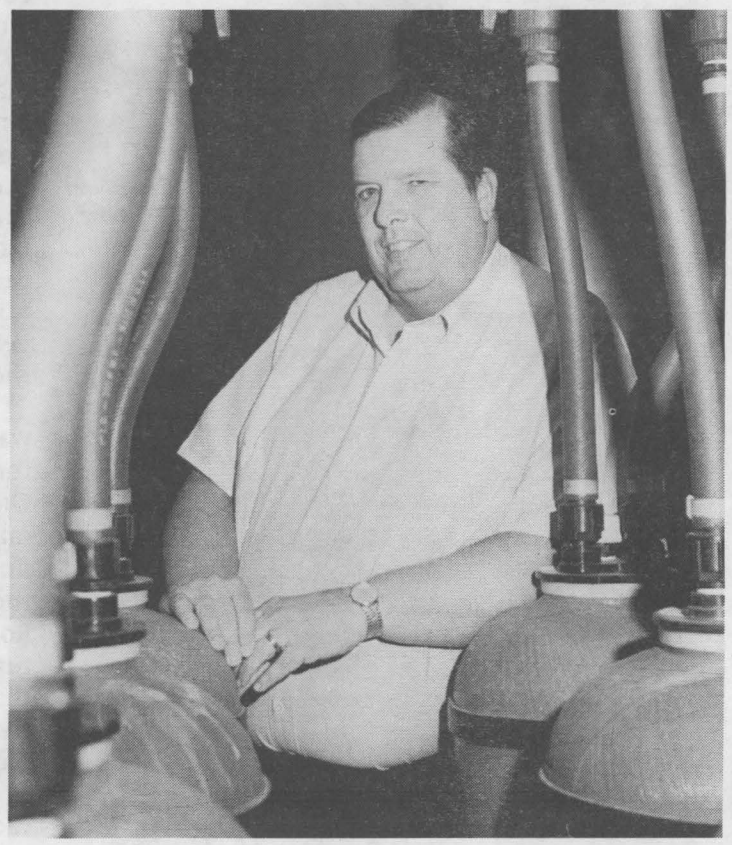
Florencio Aragon 25
12336

Myron Garcia 20
1412



John Jewell 30
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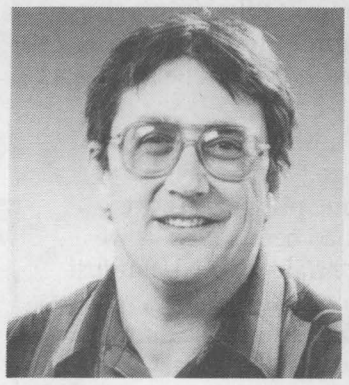

Craig Furry 20
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Louetta Tidwell 20
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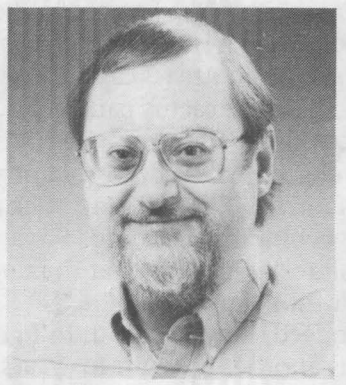

Martin Molecke 20
6113

Sandia Classified Ads

DEADLINE: Friday noon before week of publication unless changed by holiday. MAIL to Dept. 12622, 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 8½- 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.

MISCELLANEOUS

MINOLTA X-370 CAMERA, 35mm SLR, 50mm lens, $100, w/case, $115. McConnell, 271-2011.

GAS STOVE, Kenmore, 5 burners, w/middle griddle, black w/chrome top, 36-in. wide, X-large oven, '92 model, $800. Schwebke, 271-4861.

PAIR OF BURIAL LOTS, Sandia Memorial Gardens, $1,600. Burke, 1-719-275-6362 (call collect).

KING-SIZE BRASS HEADBOARD & FRAME, $135. Salazar, 294-8746 or 275-9671.

WALNUT DESK, formica top, $100; push mower, w/grass catcher; $50; Scotts spreader, $15; Hartmann luggage, $15 ea. Purcell, 281-1761.

HEATHKIT 3400 MICROPROCESSOR TRAINER, $40 OBO; IBM electric typewriter, $30. Zirzow, 281-9896.

BOAT OARS, pair, 6-1/2 ft., w/hardware, like new, $20; 2 adult boating life jackets, slim, fitted-style, $15. Freyermuth, 299-2053.

SWIMMING POOL PUMP & MOTOR, 1-hp, excellent condition, $110 OBO. Volk, 299-1702.

DRESSER, American Furniture, white oak, like new, $399; laptop computer, needs repair, $75. Banks, 291-1794.

MOVING, Amana 22 cu. ft., w/ice, $500; GE Elite washer/dryer, $500; Craftsman 21-in. mower, all 3 years or less, $125. Shen, 293-0609.

BED, twin-size, nearly new mattress/box spring; student's study desk & chair, excellent condition. Risse, 869-2037.

BEDLINER, for LWB Ford pickup, underrail model w/tailgate pad, $50. Conley, 281-6730.

CHILD'S "CORVETTE" BED, twin-size, almost new, used 4 times, complete w/mattress, $200 OBO. Maldonado, 792-1606.

STUDIO PIANO, mahogany, Starr of Richmond, w/storage bench & pad, needs some tuning, $400 OBO. Malpass, 829-3364.

SOFA, beautiful ivory-colored, custom Ethan Allen, less than 2 yrs. old, $875. Bono, 265-2853.

WING CHAIR, good condition, hardly used, dark blue brocade upholstery, $75. Tilgner, 821-7551.

HOUSEHOLD FURNITURE, get while the getting is good, good condition, great prices. Waldrop, 281-5863.

BEDROOM SET, dresser & full-size bed, $150. Narrow, 256-9159.

GOLF CLUBS, man's 12-degree Big Bertha driver, regular graphite shaft, $125; Tour Model stiff-shaft irons, $50. Perrine, 293-1429.

RADIAL TIRES, Dunlop SP Qualifier, P225/75/R15, 7/32-in. tread remaining, $40 OBO for all four. Phelan, 869-6094.

KITCHEN EXHAUST HOOD, GE, 36-in., black, like new, $60 OBO. Andraka, 294-2618.

THREE RIFLES, 30-40 KRAG sporterized 1898, w/target sights, $250; two 30.06 Springfield 03A3 sporterized, w/scopes, $350 ea. Coles, 294-3448.

MACINTOSH LC COMPUTER, 4/40, w/System 7, mouse, keyboard, color monitor, boxes/documentation, excellent condition, $495 OBO. McClain, 898-0739.

AKC BOUVIER DES FLANDRES, fawn, sweet, spayed, shots, 4 yrs., $100. Lyo, 299-6470.

SENIOR GRAPHITE DRIVER, King Cobra, $110; 3 persimmon drivers, $50 ea.; Mizuno, all graphite, $45; Bag Boy cart, $35; Hogan SW, $40. Stang, 256-7793.

DINING TABLE, round, $50; sofa w/bed, $150; 2 living room chairs, $25 ea. Watson, 298-2374.

PIANO, for serious player, Kawai Studio, well cared for, tuned regularly, $2,500. Bonzon, 828-1066.

CARDIOGLIDE, Weslo, $150; Sears Lifestyler cross-country ski machine, $150; both used infrequently by lazy couple. Sargent, 848-0407.

SOFA, light gray, approximately 84 in., very good condition, $125. Graham, 890-2748.

TV STAND, large enough for 27-in. TV, $20; twin mattress/box springs, $50 OBO. Kincaid, 246-8847.

SNARE DRUM, w/stand, case, good condition, $50. Orand, 833-2060.

CRIB, Simmons, solid ash, like new, w/mattress, $300; Sears trash compactor, $35. Ballard, 828-2504.

ARABIAN MARE, 12 yrs., 14.2 hands, to loving home, pretty chestnut, sweet disposition, experienced rider, $2,200. Rider, 281-1121.

TWO WOOD-BURNING STOVES, long-burn capacity; half-pint microwave, Montgomery Ward, warranty, $60; girl's mountain bike, $75. Garcia, 343-8207.

WHEELCHAIR, Hoyer H2000, pristine condition, used 1 month, $175. Campbell, 281-0744.

TRIPODS; one $40, another $20; excellent bargain. Luther, 822-1187.

JOG'R CYCLE, by Motiv, 3-wheel stroller, converts to bicycle trailer, $75. Lukens, 299-1271.

FIRESTONE TIRES, w/chrome rims, size P195/75/14, only 11K miles, $170 OBO. Venegas, 845-5193.

RAILROAD TIES, 8-ft. long; concrete pathway stones, 2' x 2'; free. Detry, 293-9056.

NORDICTRAK SEQUOIA MODEL, excellent condition, w/electronic controls, $300. Paton, 275-8546.

WURLITZER ORGAN, Funmaker, 3-level keyboard, build-in recorder, lamp, storage bench, books, instruction tapes, $385. Seigal, 256-3770.

TRUNDLE BED, $65; sectional sofa, $400; 48-in. round coffee table (cherry/mahoghany), $300; console TV, 25-in. stereo, $150. Bronkema, 291-1323.

STUDDED SNOW TIRES, 175R/14 (2), 195/60R15 (4), $50 ea.; CD player, $25; double stroller, $75; L. L. Bean parka, $200. Mahmud, 281-0221.

QUEEN BED & FRAME, firm mattress, used seldomly as a guest bed, $135. Wilson, 275-1059.

ANSWERING MACHINE, AT&T, $15; GTE 20-number Speakerphone, $25; both like new, w/original boxes & manuals. Everts, 822-1767.

GAS DRYER, Whirlpool, X-large 6-cycle, 5 yrs. old, great condition, $200. Gomez, 332-7502.

WURLITZER ELECTRONIC ORGAN, $600; Vitamaster treadmill, $250; Tunturi rowing machine, $100; Tunturi exercycle, $75; map file, $100. Sparks, 266-5060.

HELMSTETTER MOTIVATIONAL TAPES, advertised on KOB, $50 OBO. Jesse, 296-1709, leave message.

INFANT EXERSAUCER, Evenflo, good condition, $20; "Kathy Smith's Pregnancy Workout" videotape; playpen, w/thick form pad, infant swing. Langkopf, 293-4076.

LANDSCAPING FLAGSTONE, 1,000 sq. ft., approx. 10 tons, retail $200-$400/ton, make offer. Ferguson, 266-4769.

VOLVO PARTS, rubber window seals for 240 series Volvo, set of 4, new $130, asking $60. Plummer, 828-3028.

THOROUGHBRED GRAY GELDING, 5 years old, 15.2, excellent disposition, quiet, beautiful, excellent bloodlines, ready for serious training. Arana, 873-9064.

GIRL'S CLOTHING, infant to 2T; out-of-print Disney books; Department 56 Collectibles, retired w/boxes. Sjaardema, 299-8042.

CHAIN-LINK GATES, one 48"H x 48"W, one 60"H x 54"W, good condition, $5 ea., Wampler, 299-4910.

MICKEY THOMPSON TIRES, low mileage, 31/11.50R15, $390 OBO. Montoya, 896-1211, ask for Tim.

SOUTHWEST SOFA, lamp, wall decorations, $75/all; 8-yr.-old Tandy computer, w/printer, $50. Wanya, 294-2050.

GERMAN SHEPHERD PUPPIES, AKC-registered, black & cream, 2 male, 2 female, parents on premises, $250 ea. Gonzales, 884-6805.

GAS DRYER, GE, white, $30; boat seats, lounge-type, beige, $30. Smith, 856-9176.

MASSIVE WOODEN PALLET, approx. 5' x 7', free to the person who can take it away. Geitgey, 856-0829.

CEILING FAN, w/lights, 52-in., white/gold trim, almost new, used 1 summer, $25. Madrid, 271-9752.

POOL COVER, 15' x 30,' cost $1,300, asking $130; lawn edger, 3-hp, $50. Olsen, 294-2333.

CLAVINOVA, Yamaha's electronic piano, more, new $10,800, used 3 months, ideal for student or professional, make offer. Williams, 856-5722.

NORDICTRAK PRO EXERCISE MACHINE, superb condition, w/electronic monitor & programmable pacing unit, $399. Williams, 856-5722.

GARAGE SALE, multi-family, camping equipment, household, Sat. 6/8, 8 a.m.-1 p.m., 8506 Chambers Place NE (garage is on alley). Treml, 823-2996.

RUMMAGE SALE, for Del Norte Band, Del Norte High School, Montgomery & San Mateo, June 8-9, 8 a.m.-1 p.m. Vigil, 883-0814.

BED, twin-size frame, mattress/box spring, $60. Chavez, 293-4268.

TRANSPORTATION

'73 DATSUN PICKUP, $750. Grimm, 281-7041.

'89 MAZDA 323LX, white, 4-dr. sedan, AC, sunroof, excellent condition, $4,700. Forster, 293-7231.

'92 DODGE STEALTH, 5-spd., airbags, CD player, AC, PW, PL, aero spoiler, excellent condition, loaded, $12,800. Shahinpoor, 821-3096.

'78 OLDS DELTA 88 ROYALE, white, diesel, always garaged, never wrecked. Harrison, 884-1421.

'92 VW PASSAT GL, 38K miles, AT, PW, PL, moonroof, AC, stereo, excellent condition, below blue book, $11,500. Halfacre, 254-8676.

'93 CHEV., extended cab, 4x4, K1500, Silverado pkg., high miles, great shape, $12,500. Showalter, 281-4211.

'95 FORD WINDSTAR XL, 19K miles, teal, all power, loaded, AC, ABS brakes, airbags, seats 7, excellent condition, $18,700. Kubasek, 822-1438.

'92 FORD RANGER, 4-cyl., 78K miles, 1 owner, excellent condition. Ortiz, 890-5847, ask for Lisa, leave message.

'93 FORD F-150 XLT, supercab, 4x4, 5.8L V8, AT, fully loaded, many extras, 65K miles, $17,500. Darnold, 877-1680.

'91 SATURN SL1, 5-spd., cruise, AC, antilock, cassette, white, low mileage, $7,500. Kurowski, 881-1859.

'83 TOYOTA COROLLA, 4-dr., AT, AC, AM/FM, 72K miles, new tires, excellent condition, $2,195. Grear, 344-2009.

'94 CHRYSLER LEBARON, convertible, 29K miles, AT, power extras, turquoise w/white top, leather interior, great condition. Magnuson, 268-5955.

'89 PLYMOUTH MINIVAN, high mileage, low price, never wrecked, runs excellent, worth looking at, $4,200. Shaw, 856-1141.

'82 CHEV. S-10 TRUCK, 4-cyl., 4-spd., rebuilt engine, good condition, $3,000 OBO. Montoya, 243-7364.

'95 FORD ESCORT, 5-dr., 5-spd., AC, AM/FM cassette, 12K miles, green exterior, tan interior, $9,500 OBO. Mercer, 858-2554.

'88 CHEV. CAPRICE CLASSIC, AT, AC, good condition, $4,200. Morang, 897-7908.

'84 CHEV. CAMARO, V6, AT, T-tops, cruise, PW, AM/FM cassette, charcoal gray, original owner, $2,400. Sprauer, 275-0092.

'87 MERCURY GRAND MARQUIS, 4-dr., 90K miles, exceptional condition, $4,500; '66 Ford LTD, 4-dr., fair condition, $750. McCarty, 298-2919.

'71 LINCOLN CONTINENTAL, black, excellent condition, all original, 51K miles, new belts, brakes, exhaust, AC, $5,985. Perea, 899-2378.

'70 OPEL GT, good-running condition, $1,400. King, 899-1770.

'85 SUBURBAN, 4x4, all power, 2 ACs, excellent condition, $6,500, firm. Edgar, 298-3009.

'70 VW BUG, clean inside/out, runs well, new starter, battery & brakes, $1,250 OBO. O'Malley, 271-9269.

'66 VW BAJA BUG, rebuilt 1600 dual port & transmission, 12-volt, big tires, lots more, $1,550. Cunico, 892-8365.

'86 TOYOTA 4RUNNER SR5, loaded, new engine, new CV joints, clutch, pressure plate, 5-spd., altimeter, $8,200. Roybal, 296-8493.

'85 TOYOTA MR2, 5-spd., AC, AM/FM stereo cassette, 90K, $3,500 as is OBO. Bonaparte, 296-4916.

'88 TOYOTA TERCEL EZ, 3-dr., AT, cruise, 89K miles, maroon, 1 owner, $2,950. Simms, 256-7257.

'91 DODGE RAM 150, 1/2-ton, w/shell, 4WD, 318 V8, PB, PS, AC, 33.5K miles, book $10,400 OBO. Hole, 888-0283.

'77 DATSUN PICKUP, long bed, rebuilt engine, dependable, low-cost transportation, original owners, clean, runs well, $1,500. Zarrella, 831-1981.

RECREATIONAL

'89 SUZUKI MOTORCYCLE GSX-R 750, full fairings, low mileage, $2,500 OBO. Stanley, 255-3083.

TWO BOYS' BIKES, great starters, $25 ea.; Schwinn, 1-spd., approx. 30 yrs. old, mint condition, $75. Cibicki, 877-7098.

'86 ALLEGRO MOTORHOME, 21-ft., aerodynamic style on Chev. Astro van chassis, AT, w/overdrive, many extras, low miles. Reese, 281-3498.

WINDSURFERS, excellent stability, $165 ea.; buy both, will add extra booms & double sailbag. Gage, 293-1707.

BOY'S MOUNTAIN BIKE, 16-in., Diamondback Viper, girl's bicycle, 20-in., Panasonic; both excellent condition, $40 ea. Bixler, 856-3555.

'90 PACE ARROW MOTORHOME, Class A, 34-ft., 454 Chev., Mor-Ride suspension, fully equipped, excellent condition, 49K miles, $36,000, Martin, 271-4992.

SAILBOARD & MOUNTAIN BIKE, Mistral, great beginner board, $250; Schwinn Sierra, 15 in., Shimano Exage components, $150. Dixon, 254-1782.

'90 HONDA HAWK GT650, street motorcycle, red, excellent condition, adult ridden, $2,800. Curtis, 281-8364.

CANOE, 19-ft., fiberglass, great for fishing, $300; plastic-liner pond kit, brand new, $250; best offers considered. Chavez, 898-4475.

TIMESHARE, Lake Havasu, Arizona, studio, one-week high time or trade option, originally $10,000, asking $6,500. Robbins, 823-2492.

'91 SUZUKI DR650S, dual-purpose, 4K miles, good condition, $1,800. Curtis, 281-8364.

BOY'S BICYCLE, w/training wheels, 12-in., excellent condition, $25. Meeks, 828-9825.

CAB-OVER CAMPER, 10-ft., self-contained, stove, refrigerator, ice, toilet, shower, hot water, $800, w/F-250, 66K miles, $5,200. Horton, 883-7504.

SAILBOAT, 16-ft., Chrysler Man-O-War, 1-3 crew, boom-vang, new spare trailer tire/wheel, dagger-board & kick-up rudder, $1,200 OBO. Edmund, 881-7974.

BOAT, 17-ft., Stern drive-on trailer, skis, PFDs, etc., $2,900. Bluett, 281-1146.

TIMESHARE RESORT, RCI-affiliated, deeded ownership, 2 bdrms., 2 baths, sacrifice 1 red week, $2,500 & 1 white week, $2,000, $4,000/both. Castillo, 294-8250.

FIBERGLASS BOAT, 16-ft., 50-hp motor, w/trailer, $850. Barnett, 281-9056.

MOUNTAIN BIKE, Diamondback, 18-spd., 22-in. frame, for tall people, great shape, used mostly on road, $125 OBO. Nowaczek, 828-8149.

ROAD BIKE, 54cm Klein Quantum, Ultegra drivetrain, Look clipless pedals, excellent condition, $575 OBO. DeLaPlain, 281-3318.

'93 STARCRAFT POP-UP, 21-ft. opened, 2 iceboxes, sink, in/out stove, see at U-Park & U-Sell, $3,500. Aranda, 866-1347.

SAILBOAT, 26-ft. McGregor, 8-hp outboard, w/alt., VHF, stereo, 4 sails, pop-top canvas, extras, $7,900. Savage, 837-2692.

'93 HONDA NIGHT HAWK STREET BIKE, 250cc, 4K miles, excellent condition, $1,600. Washburn, 294-5921.

MAN'S TOURING BIKE, Peugot, 12-spd., like new, $200. Levan, 293-0079.

BICYCLES: Diamondback Apex mountain, 18-in., $260; Specialized Allez racing, 55cm, $220; Nishiki Colorado mountain, 18-in., $130. Tyner, 294-5289.

'75 LASER SAILBOAT & '92 TRAILER, $750 (will separate); 1/3 share MDM/Jeppesen IFR simulator, $150. Shapnek, 281-5913.

REAL ESTATE

2-BDR. TOWNHOUSE, 1,465 sq. ft., 1-1/2 baths, fireplace, 2-car garage, patio, clubhouse, pool, tennis, $119,900. Warner, 293-7401.

2-BDR. TOWNHOUSE, 2 baths, 2-car garage, formal dining room, great room, security system, east of Tramway, $115,000. Lovato-Teague, 298-1576.

4-BDR. MOSSMAN HOME, 2-1/4 baths, LR/DR, den, eat-in kitchen, large yard, in-law quarters, hardwood floors, 3612 Dakota, $151,500. Fisher, 881-8072.

3-BDR. HOME, 1,250 sq. ft., 1-3/4 baths, east mountains, 2 fenced acres, country kitchen, vaulted ceilings, fireplace, $101,000. Graf, 281-1533.

3-BDR. MOBILE HOME, 2 baths, covered carport, fenced yard, fully set up. Perea, 294-1871.

3-BDR. HOME, 2-story, Sandia Park, 2,300 sq. ft., 2-1/2 baths, 2-car garage, 4 large porches, 2 yrs. old, fireplace, fenced backyard, views, $214,950. Salazar, 281-0560.

4-BDR. HOME, 1,920 sq. ft., cul-de-sac, Dellyne Ct. NW, Taylor Ranch, LR/DR, large family room, w/fireplace, $135,000. Kekich, 899-4777.

THIRTY-FIVE-ACRE PARCELS, in Southern Colorado, must sell, $14,500 ea. Harrison, 897-3541.

3-BDR. HOME, 1,748 sq. ft., new, 2 baths, LR/DR, den, skylights, fireplace, secure, near Four Hills, $172,900. Koepke, 296-5643.

3-4 BDR. HOME, 2,000 sq. ft., 2 living areas, large kitchen, open, bright, excellent condition, great neighborhood, great buy, $139,900. Winowich, 255-2611.

3-BDR. HOME, Taylor Ranch, 1,200 sq. ft., 1-3/4 baths, great room, fireplace, large kitchen, large landscaped yard, 2-car garage, $104,900. Simoes, 899-1755.

TWO ACRES, Los Lunas, irrigated, city water, city sewer, natural gas, electricity, trees, $60,000. Essenmacher, 865-7066.

WANTED

TIRE CHAINS, to fit P225/75R15 tires. Dahms, 299-3822.

POOL TABLE, good condition. Hobbs, 262-4875.

WEED WACKER, weed/brush, gasoline-powered; mower, small push-reel type, or electric. Underhill, 294-5774.

HOUSING needed for professor & family, visiting SNL from Italy, month of July, speaks fluent English, has no pets, responsible. Gemmell, 292-5910.

COPY OF THE PBS PROGRAM "New Explorer: Outsmarting the Brain," aired on Tuesday, 5/21. Bustar, 296-5993.

WORK WANTED

SUMMER STUDENT, looking for odd jobs, light hauling, moving, yard work, mowing, etc. Kulju, 299-8182, ask for Jason.

LOST & FOUND

FOUND: Man's hat, Pendleton, brown, leather band, at the Cooperative Monitoring Center, Bldg 10510. Dickens, 271-4143, ask for Patricia.

FOUND: Man's Elgin 'Galaxie' watch, gold colored, in men's room, first floor of Bldg. 806. Lewis, 844-6523.

LOST: Wire rim glasses, tan Ray Ban hard case, possibly between Bldg. 892 and parking lot south of gate 10. Saylor, 844-7484.

Sandia News Briefs

Sandian Lynne Rathjen and retiree John Shunny win volunteer recognition awards

Retired Sandian John Shunny, former editor of the *Lab News*, and Lynne Rathjen, Procurement Center 10200, have been presented "Shining Eagle" awards by Community Relations Dept. 12671 in recognition of their outstanding contributions as community volunteers. John was cited for his work on the South 14 Village Project, which provides aid to needy families in the South Highway 14 area through proceeds of the Sandia merchandise program John helped create and now manages. Sandia merchandise — baseball-style caps, T-shirts, golf shirts, and coffee mugs — is available for purchase at the *Lab News* office in Bldg. 811 and in the National Atomic Museum Gift Shop. Donations to needy families have ranged from food to shoes to financial assistance in paying for a medical operation. Lynne was recognized for donating more than 1,400 hours of volunteer time over the course of one year to the YWCA, the Albuquerque Animal Humane Society, and Leadership Albuquerque. For information about the Community Relations Department's Volunteers in Action program, call Redd Eakin (12671) at 844-4124.

Send potential Sandia News Briefs to Lab News, *Dept. 12640, MS 0165, fax 844-0645.*

Summer to make splashy entrance with 'Sandia Night at the Beach'

Tickets will be $3 for June 29 get-together at The Beach Waterpark

Summer wouldn't be summer without a trip to the beach — The Beach Waterpark, that is. On Saturday, June 29, 7:30 p.m. to midnight, Sandia and DOE employees and their families and friends can slip, slide, surf, and float to their hearts' content during the first-ever "Sandia Night" at the Beach Waterpark.

"Sandia Night at the Beach" is sponsored by SERP, the Sandia Employee Recreation Program. The event will not require the expenditure of Sandia, DOE, or Lockheed Martin funds.

Human Resources Division 3000 VP Charlie Emery thinks the time is right for a Labs-wide informal gathering. "At a time of uncertainty," Charlie says, "I believe that it is important that we pay attention to our employees' morale, as well as our continuing need to come together as a single Laboratory."

Tickets for Sandia Night at the Beach are $3 per person in advance and $5 at the door — a significant discount from the regular weekend Beach admission price of $11 per person. They are available at the SERP office (first door to the left in the Coronado Club). The Beach is located at the Montgomery/Montaño exit and I-25, near the Price Club.

SERP Recreation Manager Bruce Maxey says he expects an enthusiastic response to the Sandia Night event and suggests buying tickets early. A maximum of 5,475 tickets — the capacity of The Beach Waterpark — will be sold.

"We're encouraging Sandians to make a real outing of it and to bring along their family and friends," Bruce says.

The Beach features a variety of water slides, a giant wave pool, a tubin' "river" that circles the park, regulation beach volleyball courts, and a kiddie pool with a number of pint-sized water slides. Tubes, normally available as a rental item at The Beach, will be available free of charge. A full complement of lifeguards will be on duty during Sandia Night. The facility is handicapped-accessible and has complete bathhouse shower and changing facilities. Locker rentals are available at a nominal charge.

According to The Beach's standing rules, no outside food or beverages may be brought into the park. A variety of concession stands will be open, however, featuring pizza, sandwiches, fries, snacks, soft drinks, and ice cream.

Fun & Games

Tennis — Results of the Memorial Day Weekend Tennis Tournament at the Coronado Club May 25-27: Cliff Ho (6115) defeated Larry Schneider (1243) 6-1 and 6-1 in men's singles. Larry Schneider and Gary Porter defeated Steve Slutz (1241) and Herman Smith (DOE) 6-4 and 6-2 in men's doubles. Wendel Archer (2251) and Carmen Allen (9215) defeated Teresita Martinez (2102) and Bill Candelaria 6-1, 4-6, and 7-6 in mixed doubles.

Riser town meeting postponed

The management town meeting featuring Chief Financial Officer Gary Riser (VP-10000), originally scheduled for June 19 in the Tech Transfer Center, has been postponed. The meeting will be rescheduled later when Sandia's FY97 budget outlook is clearer.

Coronado Club

June 6, 13, 20, 27 — Thursday bingo night. Card sales and buffet start at 5 p.m., early birds' bingo at 6:45 p.m.

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

June 14 — Patio BBQ buffet. A la carte buffet 5-9 p.m. Pool open to 9 p.m. Music and dancing on the patio 7-11 p.m. Music by Cross Fire.

June 16 — Father's Day barbecue. A la carte buffet served on the patio 12-4 p.m. No reservations required.

June 21 —Kids' bingo. Buffet from 5-8 p.m. Cartoons, movies, and bingo, 7-9 p.m. Free hot dog and soft drink for all kids playing bingo. Cost of a bingo packet is $2.50.

June 23 — 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 Bob Weiler, 1-4 p.m.

June 28 —Patio BBQ buffet. A la carte buffet 5-9 p.m. Pool open til 9 p.m. Music and dancing on the patio 7-11 p.m. Music by Together.

Recent Patents

William Sweatt (5725): Condenser for Illuminating a Ringfield Camera with Synchrotron Emission Light.

Narayan Doddapaneni (1523), Robert Lagasse (1815), Alan Sylwester (6203), Frank Delnick (Albuquerque), Ronald Simandl (Tennessee), and D. Gerald Glasgow (Ohio): Structural Micro-Porous Carbon Anode for Rechargeable Lithium Ion Batteries.

Alan Righter (1277): Elevated Voltage Level IDDQ Failure Testing of Integrated Circuits.

HI-HO, HI-HO — Gail Ryba (6211), an officer in the Sandia Bicycle Commuters Group (SBCG), leads just a few of the estimated 275 to 300 Sandia workers who participated in National Bike-to-Work Day on May 21 over the Los Altos bicycle/pedestrian overpass. The overpass is a popular crossing-point over Interstate 40 for many commuters. Although many were commuting by bike for the first time, most of the day's participants ride to work regularly. In addition to the morning commute, there was a lunch-hour forum at the TTC building with speakers from the KAFB Civil Engineering Squadron, Sandia Sites Planning, Sandia Traffic Safety Committee, and City of Albuquerque bicycle facilities planning and bicycle safety program. "As a result of this forum, we think there is a greater likelihood that KAFB as a whole will become more bicycle-friendly," says Ralph Wrons (7806), another SBCG officer. For more information about bicycle commuting or the SBCG, head to <http://www-irn.sandia.gov/organization/div4000/ctr4600/bicycle/sba.html> or call Ralph at 844-0601. (Photo by Randy Montoya)