

Sandia/NASA Team Studies Clouds, Climatic Change

Three researchers at Sandia, Livermore say they've had their "heads in the clouds" a lot lately. That's because they, along with researchers at NASA's Goddard Space Flight Center in Greenbelt, Md., are studying clouds and other atmospheric moisture to better understand their role in

trapping radiative heat in the earth's atmosphere.

The joint project grew out of increasing concern about global warming trends and the possibility that human activity — such as emissions of greenhouse gases like carbon dioxide (CO₂) — may lead to long-term changes in global tempera-

tures. Many scientists suggest that an increase of a few degrees Celsius in global climate could lead to significant changes in rainfall patterns and water availability during the next century.

However, little can be predicted about how significant such climatic changes might be, how rapidly they may occur, and how changes might be distributed over the globe, says Marshall Lapp of Program Development Staff Dept. 8102.

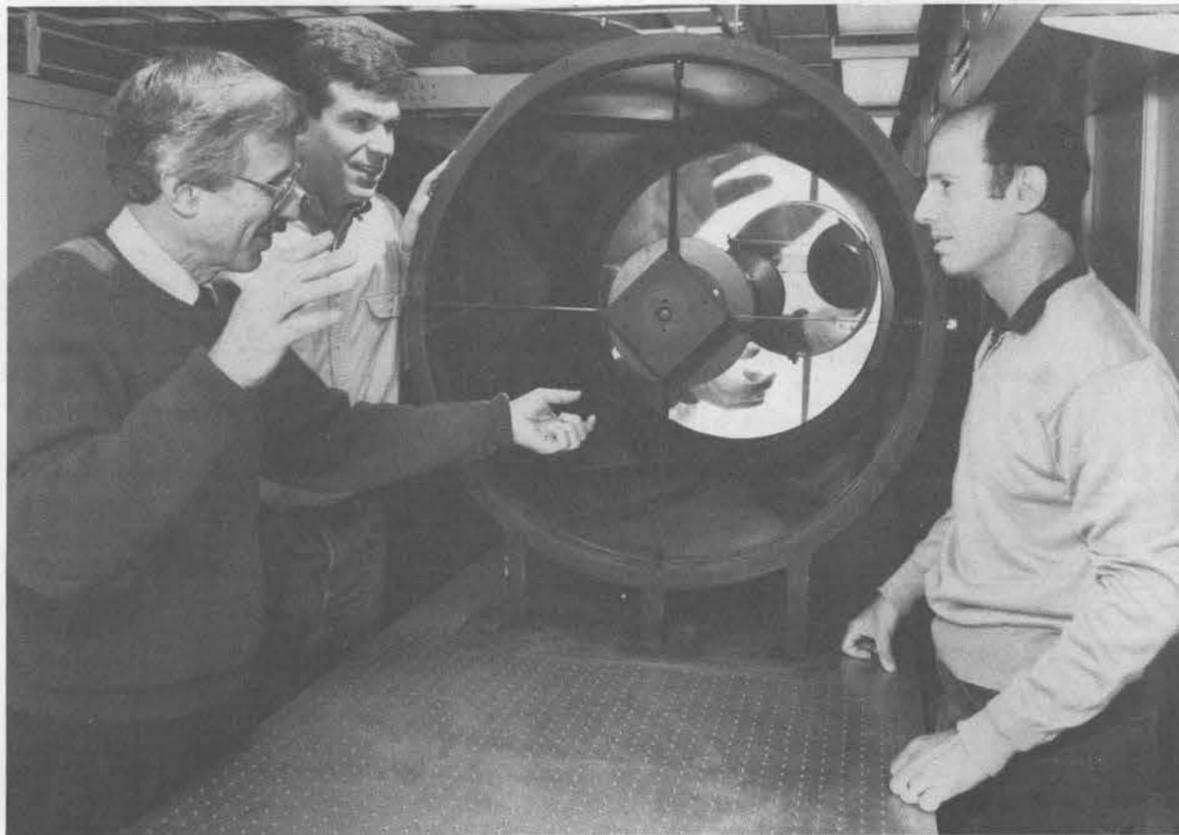
To help reduce such uncertainties, Marshall, John Goldsmith, and Scott Bisson (both of Diagnostics Research Dept. 8354), along with their NASA counterparts, are developing an advanced remote sensing device — called a laser Raman lidar — that gathers information about water vapor in the first several miles of the earth's atmosphere, both during the day and at night.

'Natural' Greenhouse Gas

A Raman lidar sensing device emits timed laser pulses and then measures the backscattering of light that occurs, similar to the way a radar emits radio waves and then reads a reflected signal. As laser light strikes gas and aerosol molecules in the atmosphere, its color is shifted somewhat depending on the types of molecules encountered. The backscattered light can then be measured to characterize atmospheric content and water vapor densities as a function of time.

Although Raman lidar devices for measuring atmospheric water vapor already exist, the focus of the Sandia/NASA group has been to develop a measuring device that can probe farther into the troposphere with greater accuracy and resolution, especially during the day, when solar background interference makes accurate measurements much more difficult.

Such measurements can provide researchers
(Continued on Page Four)



HIS HANDS REFLECTED in the telescope optics of a Raman lidar device developed at Sandia, Livermore, Marshall Lapp (left, 8102) discusses recent atmospheric moisture research with Scott Bisson (middle) and John Goldsmith (both 8354). The joint research project with NASA's Goddard Space Flight Center is a new direction for Labs research. It may lead to better computer models for predicting climatic changes and other atmospheric phenomena.
(Photo by Lynda Hadley, 8275)

Selection Based on Competition

DOE to Issue RFP For New Contract Early This Fall

DOE will use "full and open competitive procedures" in selecting a new management and operation contractor for Sandia National Laboratories when AT&T's contract expires a little more than a year from now.

The department revealed its selection plan when it announced June 30 it will issue by early fall a Request for Proposals (RFP) from organizations interested in acquiring the contract.

AT&T, which has managed Sandia since it was established in 1949, announced in May it would not renew the management and operation contract when it expires Sept. 30, 1993.

Transition Executive Lee Bray (30) praises DOE's early announcement of its plans. "All Sandians are anxious to know how the process is

"Selection will be made primarily on the basis of technical and management excellence."

going to be handled, and anything DOE can tell us as its plans develop is helpful," he says.

When Sandia President Al Narath announced AT&T's decision not to renew the contract, he also announced that Lee would head the team planning the transition.

"Our Transition Council is already working on the details we must resolve during the time leading up to the end of the AT&T contract, to
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LAB NEWS

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Cooperation Replaces Adversity

US-Russian Accord Calls On Sandia's Weapon Expertise

Just as Sandia's expertise over the decades has helped provide safe, reliable nuclear weapons for the US, the Labs and the Albuquerque Operations Office of DOE are now contributing to safe dismantlement of nuclear weapons in the former Soviet Union.

Last month's historic arms accord between American and Russian presidents George Bush and Boris Yeltsin includes several programs that will draw on Sandia's years of experience with nuclear weapons. The Labs will provide protective containers and blankets for weapon-grade nuclear materials and work with Lawrence Livermore and Los Alamos national labs to develop accident response equipment.

In addition, US and Russian researchers are discussing other potential areas of cooperation. These include retrofitting Russian railcars to make them more secure for transport of nuclear weapons and components, working with the US Army Corps of Engineers to design an underground storage system for radioactive materials from dismantled nuclear weapons, establishing a state system of control and accountability for nuclear materials (including those from atomic

power plants), and developing a policy for the ultimate disposition of fissile materials.

Barriers Come Down

Military cooperation with the Russians, as opposed to adversity and secrecy, is something many Sandians, including VP for Defense Programs Roger Hagengruber (5000), did not expect would happen in their lifetimes.

"We are living in a rapid and profound period of change for US security," says Roger. "The challenge to Sandia is to continue to provide leadership in a rapidly changing political environment.

"I think the barriers of traditional hostility and secrecy are coming down. The Russians have made commitments to dismantle nuclear weapons, and while we are being careful to protect our own security interests, we are finding opportunities to help them."

After a failed coup attempt in Russia last August, President Bush took steps to help eliminate large numbers of nuclear weapons by offering US technical assistance in nuclear weapon
(Continued on Page Five)

This & That

Hot News! - Lots of things seem to be going on that need reporting now that vacation season has arrived and the LAB NEWS staff is trying to get in a little R&R. Thanks kindly to everyone offering story ideas, but please try to exercise something that I don't have much of - patience. We may need to visit that company that sells more time and one that sells type and photo "shoehorns" to help us squeeze everything into the paper this summer.

* * *

No Conspiracy - As chief company rumor killer, I gotta put another one to rest. There's no truth to the recent rumor about Albuquerque city officials and Sandia management conspiring to block off so many traffic lanes near the base that about half of us will be fired for being consistently late for work. After all, that would mean a loss of tax dollars for the city, and then it couldn't afford all those orange barrels and street construction crews.

* * *

Quick Quizzes - I'm betting only one group of Sandia employees can answer this correctly. What's a "Blue Max Twister"? A new high-speed roller coaster, maybe? A new version of the Twister game? Perhaps a new weapon? Wrong, wrong, wrong! It's a brand of mop used by Sandia custodians, at least in charming old Building 814.

And I'm betting that only the real "wordoholics" can answer this one without a dictionary. "Graffiti" is plural. What's the singular form? It's "graffito," defined in Webster's as "an inscription or drawing made on a rock or wall."

* * *

Cleaning It Up - Speaking of graffiti, the community spirit of Sandians showed strongly again when Albuquerque-area employees helped more than any other group to bring in several thousand bucks for the Keep Albuquerque Beautiful Graffiti Cleanup Program. Labs recycling coordinator Louise Bland (7616) says Sandians sent in more than \$10,300 in grocery receipts in response to a LAB NEWS item several months ago. It announced that the Glad-Bag Company would contribute to the program money equal to 15 percent of the total amount of the receipts submitted, up to a maximum of \$2,500. The campaign was community-wide, so the full amount was obtained for the cleanup program, says Louise.

* * *

Blueberry Bagel Blues - After examining the last in a package of blueberry bagels that I brought to work several weeks ago, it dawned on me that these things could be dangerous. When they get that old, you can't tell if the dark blue stuff is blueberries or mold, so you eat 'em at some risk. Not wanting to jeopardize my health, I decided to give that last one to one of my writers. I guess it was still good because he didn't take any sick leave.

•LP

Benefits Department Service Hours Change

Beginning Wednesday, July 15, the new customer service hours for the Sandia, Albuquerque Benefits Department and the on-site Mutual of Omaha Representative (Bldg. 832, east end) will be 9 a.m. to 3 p.m. Monday through Friday.

During these hours, Benefits employees will be available to answer questions either by phone (844-5677) or in person; Sandians are encouraged to make an appointment if questions cannot be answered by phone.

Claim forms and envelopes (for medical, dental, vision, and reimbursement spending accounts) are available through organization secretaries and Just-In-Time, or by calling Sandia Line (845-6789) from a push-button phone and pressing 9 for "Quick Key" and 1088 followed by the # button. The operator will ask you to state which and how many claim forms you need and then will ask you for your name, street, city, state, and zip code. After each of your responses, press the # button.

Drop boxes will also be mounted outside the east and west doors of Bldg. 832 for messages, enrollment forms, etc. In addition, information can be faxed to the Benefits Department on 844-0662. As usual, completed claim forms must be mailed directly to the Claims Administrator; do not send claims to the Benefits office.

Get the Facts Tuesday About Sun Exposure

Dr. J. Wendall Robison will present a lecture about skin cancer prevention on Tuesday, July 14, at noon in the Technology Transfer Center (Bldg. 825). In 1989, after Sandians heard Dr. Robison's talk, 160 had a follow-up screening exam. He found 80 persons who had some form of skin cancer.

In 1990 and 1991, Dr. Robison returned to Sandia to discuss strategies for prevention and the optimistic news for treatment.

Topics for this year's lecture include the three primary types of skin cancer, how to evaluate your own skin, mechanisms of tanning and pigment production, and analysis of the ozone layer and its implications for skin cancer prevention in the future.

Congratulations

To Jane Poppenger (2483) and Stephen Vogel, married in Albuquerque, May 23.

To Estella and Earl (9132) Creel, a daughter, Kynsey Morgan, May 25.

To Patricia and James (9231) Klarkowski, a daughter, Alethea Ann, June 20.

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ADVANCED MANUFACTURING and Sandia's role in it was the topic being explained by President Al Narath at a June 25 Kansas City news conference. Held at DOE's Allied-Signal plant, the event announced the Labs' new Center for Advanced Manufacturing Technology 2900 (LAB NEWS, June 26), geared to serve US manufacturers. DOE Secretary James Watkins (beside Al) also announced that Allied-Signal's recently completed Flexible Manufacturing System facility will also be a source of advanced technology development for US businesses. Earl Bean, Manager of DOE's Kansas City Area Office, is seen beside Watkins. Speaking about both centers, Watkins said, "These are examples of our ability to use the expertise developed in our weapons labs to improve the competitiveness of US industry in global markets." Calling the centers "peace dividends," Watkins added that they are "fruits of our victory in the Cold War." Bill Alzheimer will direct the new Sandia center under VP-2000 Heinz Schmitt's leadership. The LAB NEWS will have more about the new center in an upcoming issue.

Destroying Waste Materials**Researchers Study Destruction of Toxic Wastes in Liquid**

For decades, food industries have extracted unwanted substances from foods, such as caffeine from coffee beans and cholesterol from eggs and dairy products, with a technique called supercritical water oxidation. Now scientists at Sandia, Livermore have reached a new milestone in their study of how to destroy aqueous toxic wastes by putting the same principle to use.

Supercritical water oxidation is used for wastes such as oil, pesticides, solvents, or other organic materials suspended in water. By subjecting the waste to high temperatures and pressures and injecting an oxidizing agent such as oxygen, air, or hydrogen peroxide, the waste material is converted to substances that can be made harmless through conventional neutralization methods.

An interdisciplinary Sandia team recently designed and built a supercritical water oxidation flow reactor called the Materials Evaluation Reactor (MER). Test results from its first full operation, using methanol as a waste material, indicate tremendous waste-destruction efficiency.

Innocuous Products

Sheridan Johnston, Manager of Industrial Technology Initiatives Dept. 8103, says that the concept of using supercritical water oxidation to destroy toxics—discovered at the Massachusetts Institute of Technology by researcher Mike Modell—is only about 12 years old. The term “supercritical” refers to subjecting the waste to a temperature and pressure above its critical point, where vapor and liquid phases become indistinguishable. That’s typically 600 degrees C and 4,000 pounds per square inch. Under those conditions, hydrocarbons in the waste stream dissolve and can be oxidized. The effluent from the process includes water, carbon dioxide, nitrogen, and other gases.

Two years ago, scientists at the Combustion Research Facility (CRF) designed and built a supercritical flame reactor to study how high-temperature flames form spontaneously during supercritical water oxidation (LAB NEWS, June 15, 1990). “When we completed the flame reactor,” says Sheridan, “we realized we also needed a flow reactor to really be able to contribute to the development of supercritical fluid technology.”



MATERIALS EVALUATIONS REACTOR team includes (standing, from left) Tim Eklund (8451), Ben Odegard (8714), Jim Bartel (8007), Larry Hoffa (8441), and Steve Rice (8364); seated (from left) are Tony LaJeunesse (8441), Clyde Seibel (8641), and Marvin Kelley (8007).

The MER that resulted is a 12-foot-long reactor that can process about 10 gallons of aqueous waste per day in an environmentally safe and cost-effective manner, says Sheridan.

Useful Diagnostic Tool

MER’s real purpose is to help researchers evaluate different reactor materials and gain important reaction information—such as data about the chemical kinetics and waste destruction efficiency inside the flow reactor. This information will help them improve future commercial designs.

The MER is designed to operate at temperatures and pressures that are well above the previously typical supercritical water oxidation conditions, so exploration of system characteristics outside the normal ranges may help researchers pinpoint optimal conditions for waste destruction.

Two other features of the MER contribute to its usefulness as a diagnostic tool, says Sheridan. One is its modular design using off-the-shelf, commercially available hardware. Showing that a reactor can be built without special components enhances the commercial viability of the technology,

he says. The MER’s modular design allows the reactor to be easily reconfigured as more is learned about how supercritical water oxidation works. And because the two-foot modular reactor segments are replaceable, both non-destructive and destructive examination methods can be used for evaluating corrosion and deposit buildup inside the reactor—two of the main issues confronting successful commercialization.

The other significant feature of Sandia’s MER is its optical accessibility. An optical module that allows diagnostic laser beams to probe inside the reactor during experiments can be placed anywhere in the reactor. This feature means researchers can study various parameters and locations within the reactor on an in-situ and real-time basis.

An Interdisciplinary Team

The MER project was a collaborative effort, says Steve Rice of Environmental Technology Dept. 8364, the principal investigator of the project. It required expertise in flow reactors, laser diagnostics, chemistry, materials, and high-pressure technology.

Involved in the project were Tony LaJeunesse (8441), Jim Bartel (8007), Marvin Kelley (8007), Clyde Seibel (8641), Tim Eklund (8451), Ben Odegard (8714), and Larry Hoffa (8441). Other support came from Jack Swearingen, Manager of Technology Applications Dept. 8113; Gene Ives, Director of Weapon Development Center 5300; and Peter Mattern, Director of Core Competency Support Center 1010.

Already, says Steve, the MER is attracting a lot of attention from customers who are interested in new waste-destruction technologies. The Army, Navy, Defense Advanced Research Projects Agency (DARPA), DOE’s Office of Basic Energy Sciences, and DoD’s Office of Munitions (through a DoD/DOE Memorandum of Understanding) have all provided funding for engineering studies

(Continued on Page Six)

**SANDIA LIVERMORE NEWS**

HUNDREDS OF Sandians gathered for an on-site “Day at the Carnival” presented by Education Outreach Dept. 8526 June 19. The purpose of the event was to familiarize Sandians with the school science carnival program and recruit carnival program participants, who will visit schools in Northern California to demonstrate principles of math and science to students. Steve Ortiz (35, left), education outreach coordinator for Sandia, Albuquerque, demonstrates a hands-on glove bag exhibit to Steve Bunn (8441), his hand puppet, and Ray Ng (8526), science carnival coordinator for Sandia, Livermore.

**Orham Honored by VA**

Carmella Orham (8712) was presented California’s Outstanding Veterans Administration Voluntary Service Award recently for her work with the VA Medical Center in Livermore. The award included an honorarium given in her name to the medical center and another to a VA patient. The award was sponsored by the California State Society of the National Daughters of the American Revolution. Carmella was also recognized by the US Department of Veterans Affairs for having given more than 1,200 hours of voluntary service at the medical facility during a six-year period.

(Continued from Page One)

Cloud Studies

with the continuous, detailed data needed to develop complex general circulation models (GCMs) of the earth's atmosphere — computer models that can help scientists predict long-term trends in global climate change and may help government policy-makers plan for the future, says John (see "GCM Researchers Look into the Future").

John says the current focus on carbon dioxide as a contributor to greenhouse warming is largely because CO₂ is the most important "heat-trapping" agent resulting from *human activities*. But the potential warming effect from clouds and atmospheric water vapor — a natural "greenhouse gas" — far exceeds that of CO₂, he says.

"The atmospheric abundance of water vapor, the main ingredient of clouds and a significant absorber of infrared radiation, is greatly influenced by changes in global climate," says Marshall.

"Because the temperature of the earth/atmosphere system is determined by the balance between the solar energy absorbed by the earth and the energy emitted by it," he says, "factors that change that balance, such as increased clouds and water vapor, might cause radiative forcing of our climate." In other words, he says, a hotter climate caused by CO₂-induced warming could increase the amount of water vapor in the atmosphere, which further increases temperature, and so on, says Marshall.

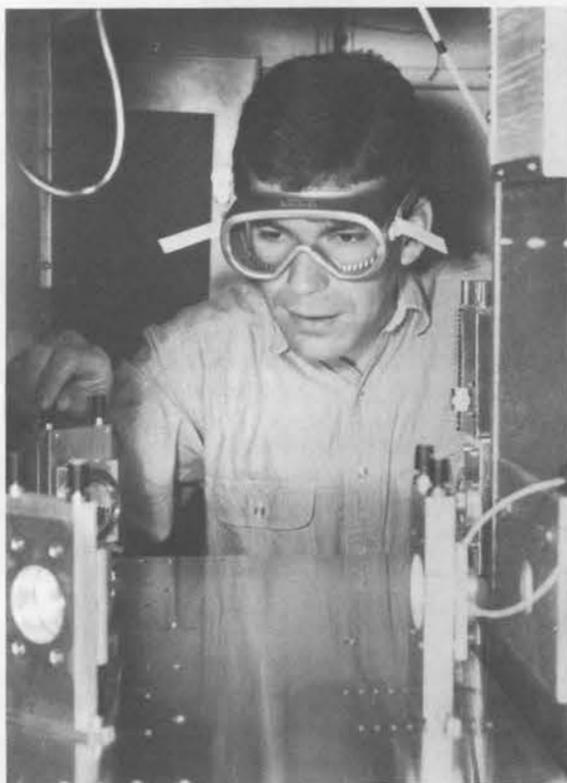
"Feedbacks from clouds and water vapor may be the most important factors for predicting possible climatic responses to human activity," he says.

On the other hand, cautions Marshall, an increase in clouds could possibly reverse this trend, indicating that significantly more research is needed in this area if we are to fully understand such phenomena.

New Direction for Sandia

The Sandia/NASA project is supported through DOE's Atmospheric Radiation Measurement (ARM) Program, a program that grew out of increasing concerns about global warming trends and the need for new atmospheric measurement technologies.

As part of the program, instruments such as a nighttime/daytime laser Raman lidar developed in



SCOTT BISSON (8354) adjusts the internal optics of a laser light source for a lidar telescope. A Raman lidar sensing device emits timed laser pulses and then measures the backscattering of light that occurs. The backscattered light can be measured to characterize atmospheric content and water vapor densities.

(Photo by Lynda Hadley, 8275)

GCM Researchers Look into the Future

Atmospheric scientists generally agree that the planet is undergoing a relatively rapid climate change as greenhouse gases, many created by human activities, trap thermal energy within our atmosphere. Others say earth is experiencing a normal temperature fluctuation in a slow geological cycle of changing climates. Despite the uncertainty, all agree that more research is necessary if we are to resolve the global warming issue.

Complex computer models, called general circulation models (GCMs), that divide the earth's atmosphere into a three-dimensional grid, or lattice, are now being developed. Atmospheric data in each grid — such as temperature, water vapor density, and wind velocity — can then be studied as a function of time and in relation to other grids. By modeling the atmosphere in this way, scientists believe they can better describe climate processes as well as identify trends, says Marshall Lapp (8102).

Several different GCMs have been devel-

oped using different study methodologies and physical approximations. DOE's Atmospheric Radiation Measurement (ARM) Program is aimed at developing GCMs that improve methods for treating solar and thermal radiation transport in the atmosphere and its interactions with clouds, water vapor, and aerosols.

The initial phase of the DOE program is ground-based, meaning much of the GCM data will be taken from various DOE-managed ground stations called Cloud and Radiation Testbed (CART) sites. However, says Marshall, DOE also will correlate ground data with satellite and other information.

"GCMs help us describe regional and global climate processes as well as understand what may happen to the earth's climate in the long term," he says. "Such information may be useful to policy-makers and government officials as they make economic, social, and environmental decisions for the future."

the Sandia/NASA study will be employed at new Cloud and Radiation Testbed (CART) sites. Data from these sites will help DOE develop improved GCMs. The first CART site has just begun operating in northeast Oklahoma.

Marshall says cloud studies and global climate change are relatively new directions for the Labs. Sandia's cloud researchers presented their preliminary results at the Conference on Lasers and Elec-

Cloud studies and global climate change research are relatively new directions for the Labs.

tro-optics in Anaheim, Calif., in mid-May, and they will present more information this month at the International Laser Radar Conference in Boston.

Part of the group's success, says Marshall, is the combining of NASA's water vapor lidar expertise and Sandia's expertise in Raman technologies and other laser diagnostics approaches. "Harvey Melfi, the NASA/Goddard principal investigator, and his colleagues have been involved in atmospheric lidar measurements for many years," he says, "and Sandia has a long tradition utilizing advanced lasers and light-scattering diagnostic techniques to measure gas properties. The research couldn't have run more smoothly for two groups working 3,000 miles apart."

Nighttime Hunters Warned

Scott says NASA/Goddard provided the van-mounted Raman lidar used in field experiments for the project, which took place late last year in Coffeyville, Kans. — a town of 12,000 selected for its

extreme weather patterns — where researchers gathered to study cirrus clouds with dozens of atmospheric measurement instruments.

Most of the Raman measurements took place at night on abandoned runways of a remote airport, he says. But the nighttime field work caused an unexpected complication. Because the work was scheduled during the hunting season, the local paper had to warn hunters in the area not to accidentally take aim at any scientists. Hunting near the airport was banned until the researchers left.

Marshall says Sandia has other strong ties to the ARM program, all part of the overall Sandia climate research program led by John Vitko (8102). Larry Thorne (8102) and Philip Kegelmeyer (8351) are developing another ARM instrument for characterizing clouds with whole-sky imaging cameras, and Donna Edwards (8117) is helping develop CART-site data management techniques. Bernie Zak (6321) has also been selected by DOE to serve as Site Operations Manager of a future CART site in Alaska. In addition, Sandia is helping DOE with proposals to expand the ARM program to regional and global scales using unmanned aerospace vehicles and satellites.

Members of the Sandia team say they're optimistic about the Labs' potential to make a contribution to global climate studies. Water vapor measurements will provide needed data for GCM predictions of global warming, and further development and application of lidar instrumentation may help improve techniques for remote environmental monitoring, treaty verification, and chemical weapon detection.

"We are in an excellent position to make contributions to major problems facing the country and the world," says John.

(Continued from Page One)

New Contract

make the changeover as trouble-free as possible," Lee says.

The council is using the LAB NEWS, Radio Sandia, Sandia Line, and other methods of keeping Sandians abreast of transition news. "As soon as we learn something new about the transition process, we let everyone know about it," says Lee.

"All of us on the council are aware of the concern employees feel as they contemplate an unknown as important as the future shape of our careers, and one of our primary goals is to keep everyone up to date about the process," he adds.

The DOE announcement says work is under way to develop the RFP and other information

potential contract bidders might need. It says the selection process is expected to take about one year.

"The competition will be open to all qualified bidders, including for-profit companies, and educational as well as other non-profit institutions," the announcement says. "Selection will be made primarily on the basis of technical and management excellence."

Secretary of Energy James Watkins has asked those in charge of transition operations to make every effort "to preserve without disruption the body of scientific, engineering and technical knowledge represented by the Sandia Laboratories workforce and to minimize the impact on individuals as a result of this transition."

The announcement says the competition for the contract will be conducted through DOE's Albuquerque Operations Office.

(Continued from Page One)

US-Russian Accord

safety, security, and dismantlement.

"As early as spring of 1991," says David Nokes (5801), who is coordinating Sandia's participation in the dismantlement effort, "the Secretary of Defense asked us to think about how we could help the former Soviet Union if things got chaotic. What happens to the enormous stockpile of thousands of strategic and tactical nuclear weapons in their inventory?"

By last December, Congress and the President had authorized \$400 million to dismantle, destroy, and prevent proliferation of nuclear and chemical weapons.

Delivery Begins in 1993

Sandia-designed protective blankets will be provided within a year, accident response equipment by February 1993, and up to 10,000 containers for fissile materials by December 1995.

Labs Still Helping Keep Peace, Says Domenici

US Senator Pete Domenici expects increased cooperation with the former Soviet Union and foresees important tasks for Sandia.

"Just as Sandia helped keep the peace during the height of the Cold War with the Soviet Union, it is exciting to note that the lab is still keeping the peace, in new and different ways, as we begin cooperative enterprises with our former adversary.

"I believe our future relationship with the republics of the former Soviet Union will be marked by increased cooperation in many areas. No doubt Sandia, with its wealth of people and resources, will be at the forefront of those efforts."

Mark Kincy (5165) designed containers that will be used to transport and store radioactive materials from nuclear warheads. In fact, he modified the design of the container requested by the Russians, reducing the number of parts from 37 to 7 and the cost by a factor of three, notes Dave.

The cylindrical containers will be 18 inches wide by 18 inches tall, says Mark. Initially, 10,000 of the containers will be delivered, and several thousand more may eventually be authorized.

In another joint project, Sandia will provide accident response equipment to the Russians. Stan Spray (331), program manager of the accident response group, says his group, which includes Dave Shirey, Dave Jones, and Steve Roehrig (all 9600), is designing new versions of systems initially developed for DOE. For example, the Portable Integrated Video System would serve as a communication link between an accident site and command post, providing instantaneous computer data and video and audio information.

Carl Schuster (9503) is the Sandia lead in developing a Kevlar blanket that was tested jointly with the Russians at Sandia in late April to determine its suitability as a protective covering during weapon transport. John Kane (9503), who has years of experience in designing security systems for weapons, is coordinating that effort. The Russians will receive 2,500 of these blankets.

In another agreement that has yet to be formally signed, Sandia is prepared to provide fire detection, security, and command and control systems for 115 Russian railcars, says John, who with Bob Cranfill (9613) and Lyle Kruse (9561) is designing the systems. "We're in the process of negotiating the design requirements with the Russians."

The Army Corps of Engineers is working jointly with the Russians to design and construct underground storage facilities for materials from dismantled weapons — that's where the 10,000 containers being designed by Sandia will be stored — and material control and accountability.

Roger Hagengruber notes that Sandia's role has been to act expeditiously but cautiously to identify opportunities to assist the Russians that are compatible with national and international security. This involves setting priorities consistent with the hazards presented by nuclear weapons and realizing that the scope of the



DAVID HUMPHREYS (5165) runs a check on an H-1616 Tritium Bottle Shipping Container similar to containers to be used in Russia.

task is far too immense to be solved overnight.

"Nuclear weapons themselves are the most threatening nuclear concern of all, and they must have our first priority in cooperation with the former Soviet Union," says Roger. "Our next concern must be to support protection and control of nuclear materials and technologies. And there are good prospects for cooperation in cleaning up environmental contamination and pursuing peaceful nuclear technologies."

•LDoran (7161)



DAVE SHIREY (9567) operates the Portable Integrated Video System during a field exercise. The hand-carried system, packaged in suitcases, would transmit video and audio information as well as computer data over a single fiber-optic cable from the site of a nuclear accident to a command post.

Bingaman Foresees Major Sandia Role

US Senator Jeff Bingaman predicts that Sandia will have a lot of work to do in assisting the Russians with dismantlement of nuclear weapons.

"The treaties announced by President Bush and President Yeltsin are extremely far-reaching, and are going to take the rest of this decade at least to implement. During that time, I think Sandia will have a major role in verifying that the Russians are doing what they say they are doing and assisting them where possible. Sandia is already involved in various activities related to the funding we provided last year to help with weapon safety and dismantlement. And I think that activity will increase for Sandia in the next few years."

feed miback

Q: The new building in Tech Area 1 just north of Building 823, the new standards building, has a very large expanse of concrete wall with no windows. The wall faces the pedestrian mall that runs north and south. I propose that Sandia use this very large expanse of wall for a mural. We could have a contest to choose the design.

There are precedents for this in the community. There was a community design for a mural at the old airport, prior to the recent remodeling. The city has an "Arts in the Parks" fund. The

Sandia thunderbird logo was designed by Clyde Walker many years ago.

A: Thank you for your suggestion. I appreciate your desire to make our environment appealing; Facilities' goal is to provide a pleasing work environment. However, we do not want taxpayers to think Sandia is misusing funds that might be better spent on more prosaic needs. Given the recent furor over the city's art projects, and the fact that each person reacts differently to a given piece of art, it is likely that a mural would be regarded by some as frivolous or wasteful. We will revisit your suggestion as our future plans evolve.

Jim Jacobs (7100)

Recent Retirees



Vic Lopez
7612



Jim Lovell
9332

35

Senators Seek Additional \$50 Million**Domenici, Bingaman Push Funding for Tech Transfer Work**

Senators Pete Domenici and Jeff Bingaman have asked the Senate to approve \$141 million to support tech transfer activities at Sandia and the other DOE weapons labs, including \$50 million in additional funding for this fiscal year.

Both signed a June 24 letter to Sen. J. Bennett Johnston, urging his support of DOE Secretary James Watkins' request for money for labs-industry research and development partnerships. Johnston is chairman of the Senate Appropriations Subcommittee on Energy and Water Development.

"We would urge that your subcommittee pro-

vide both the requested fiscal year 1993 level of \$91 million and the requested fiscal year 1992 reprogramming for lab-industry partnerships within the Atomic Energy Defense Activities research and development line," their letter says.

The reprogramming they support is a request from Watkins to reallocate \$50 million within the current DOE budget for tech transfer partnerships. Two committees in the House of Representatives have blocked the reallocation request, and the House has approved only the \$91 million requested for fiscal year 1993.

Both senators praise Watkins' efforts to foster

lab-industry partnerships in technology that can be used in both defense and non-defense applications, saying he was one of the initial supporters of the National Technology Initiative. The NTI has heightened industry interest in dual-use partnerships, they say.

"We are seeking, essentially, to change the culture of self-sufficiency within the labs and push them in the direction of cooperating with industry whenever DOE's mission needs overlap with industry's efforts to remain competitive," their letter to Johnston says.

Bingaman says Sandia and the other labs have proven the value of labs-industry partnerships in developing new dual-use technologies.

"This funding is essential in helping the labs move toward cooperating with industry in areas such as environmental clean-up, electronics and computer technology, advanced materials, and manufacturing," he says.

Domenici agrees. "Particularly during this time when the labs are working earnestly to diversify their missions and their partners, they need this assistance," he says. "Our labs, together with the nation's industries, are doing all they can to lend their expertise to exciting new endeavors, and the federal government has a major role to play in giving them the support they deserve." •

Senate OKs Bill Making Technology Transfer Official Labs Work

The Senate approved a bill July 1, co-sponsored by Senators Pete Domenici and Jeff Bingaman, that would make forging technology transfer partnerships part of the missions of the federal government's national laboratories.

The National Laboratory Partnership Act of 1992 (LAB NEWS, May 29) now heads to the House for action there.

Bingaman points out that Sandia already has dozens of cooperative research and development agreements with industry and dozens more under negotiation, and says, "This bill

will encourage laboratory partnerships with industry on a much broader and deeper scale."

And Domenici adds, "This bill represents a recognition that each of our federal laboratories has a great potential to work with industry and academia in areas which are not limited to the specific, original missions of the labs."

Domenici and Bingaman co-sponsored the legislation that formally opened the DOE labs to tech transfer, the National Competitive Technology Transfer Act of 1989.

(Continued from Page Three)

Destroying Wastes

using the MER's capabilities. Sandia has also recently been approached by a company that produces high-pressure pumps and is interested in studying corrosion in pumps for supercritical water applications.

Special National Labs Skills

Sheridan says the MER project is a good example of Sandia using its unique breadth of technical expertise to help industry solve common problems. Sandia, he says, with its high concentration of scientists and engineers of varied backgrounds, can address problems that developing industries cannot, such as dealing with mixed radioactive and hazardous waste or explosive waste. This requires the special skills found at a national lab such as Sandia.

For example, in a follow-on study of corrosion in supercritical reactors using simulated mixed wastes from holding tanks at DOE's Hanford facility, Bernice Mills (8714) was able to characterize in detail the surface of different reactor containment materials exposed to the supercritical brew. This information is the first of its kind and has generated much interest from industry.

The MER also falls into the category of dual-use technology, says Sheridan. The basic MER technology is being evaluated by the National Research Council as an alternative to incineration for disposing of chemical weapons, by DOE for treating explosive wastes from nuclear weapon dismantlement, by the Air Force for destroying aging solid rocket propellants, by the Army for destroying smokes and pyrotechnics, and by NASA for disposing of human waste generated during extended manned space missions. In addition, its applications in the private sector may include learning how to obtain energy from effluent in the paper pulp industry, handling dry cleaning and pesticide waste, and treating petroleum industry waste.

Researchers have also created a high-pressure version of the CHEMKIN gas software code (developed at Sandia in 1980), says Nina Bergan of Technology Applications Dept. 8113. This code models the chemistry, kinetics, and thermodynam-

ics of the MER reaction and can help researchers better understand supercritical water oxidation inside the reactor.

"This kind of information helps in addressing design optimization and scaleup issues that can't be done in a lab," says Nina, "such as at what point and under what circumstances acids are formed. Because these acids are corrosive and can affect the life of the reactor, this information can help designers temper the effect of acids by altering the position where they are formed."

Using both the computer model and the MER experiments, Sheridan says, it's Sandia's goal to increase the value of the technology by examining materials in a supercritical environment to enhance the destruction of aqueous toxic wastes. •

Sympathy

To Gloria Solis-Spidle (7322) on the death of her mother-in-law in Memphis, May 13.

To Tim Cooley (9543) on the death of his brother in Kansas City, June 10.

To Dora (6400) and Fred (2543) Gunckel on the death of her mother and his mother-in-law in Albuquerque, June 17.

To Joe Chavez (9231) on the death of his father in Albuquerque, June 28.



CUT A HAT DEAL with the folks at the LAB NEWS and you lend a hand to people who need help as well as get yourself a handsome cap or useful knife. The new style cap is black with gold lettering, and the knife is a deep red color. The caps feature adjustable sizing, and the knives include a cutting blade, nail file, scissors, and tweezers. These caps are \$8 and knives are \$10. Money raised from the sale of these and other Sandia logo items — including other caps, T-shirts, and coffee mugs that sell for \$7 each — is donated to charitable causes. More than \$4,100 was contributed last year. Much of that went to needy families in the villages of Escabosa, Chilli, Tajique, Torreón, Manzano, and Punta on the east side of the Manzano Mountains, a charitable effort known collectively as the South 14 Village Project.

Supervisory Appointments

WANDA "WENDY" BECHDEL to Manager of Administrative Support Dept. 1701.

Wendy joined the Labs in 1981 as an accounting clerk in the General Accounting Division. In 1982, she transferred to the Data Planning Operations Department, where she did digital waveform retrieval and analysis. She became an MLS trainee in 1983 and joined the Financial Policies and Procedures Division. She also



WENDY BECHDEL

worked as a budget and financial analyst for the Internal Budget Division. In 1986, she transferred to the Information Systems Department and was project leader and system analyst for facilities information systems. She became an administrative assistant in the Materials and Process Sciences Center in 1988.

Wendy has a BBA in accounting and an MBA in management information systems, both from UNM. Before joining Sandia, she worked for a CPA firm in Albuquerque and an investment banking firm in Baltimore. She is a mentor at the Albuquerque Public Schools Career Enrichment Center.

She enjoys cake decorating, sewing, and toile painting. Wendy and her husband Jim (7154) have two children and live in the NE Heights.

VICTOR JOHNSON to Manager of System Surety Engineering Dept. 324.

Vic joined Sandia's Electromechanical Components Division in 1980. He was leader for the MC2969 stronglink switch project. From 1987 to 1991, he was project leader of the detonator safing stronglink program for the W89. Since 1991, Vic has been a member of the core team developing the Technology Assessment and Development Plan for Non-Nuclear Components to be submitted to the DOE Complex 21 Reconfiguration Office under the direction of DOE/AL.



VICTOR JOHNSON

Vic has a BS and an MS in mechanical engineering from Oklahoma State University. He is currently working on a PhD from UNM. He is a member of the American Society of Mechanical Engineers.

Vic enjoys running and coaching children's baseball. He and his wife Andrea have two children and live in NE Albuquerque.

WADE ISHIMOTO to Manager of Facilities Customer Representative Office 7012.

Wade joined Sandia in 1985 as a member of the Security Operations Training and Support Division. He led the emergency management program and was project manager for design and construction of a new Sandia Emergency Operations Center. In 1987, he transferred to the Nuclear Security Systems organization and had Nuclear Emergency Search Team (NEST) responsibilities, including leadership roles in three major interagency



WADE ISHIMOTO

exercises. He led the NEST Training Management Program and was a member of the standing committee of the NEST Operations Working Group. Wade was on the US Physical Protection Bilateral Team visiting Korea and Japan at the time of his promotion.

He has a BA in Asian studies from the University of Hawaii and an MA in human resources development from Webster University. Before joining Sandia, Wade worked in Safeguards and Security at DOE/AL and earlier was VP of Operations of a Texas firm. He served with the Army from 1961 to 1982. He is president of the Albuquerque Ki Society and a member of the Special Forces Association, the International Association of Chiefs of Police, the Japanese American Citizen's League, and the Asian Leadership Outreach Committee. Since joining Sandia, Wade has received written commendations for his safeguards work from DOE, the FBI, and the military services.

In his spare time, Wade teaches Aikido. He and his wife Bobbi live in the far NE Heights.

HAROLD STEWART to Manager of Silicon IC Patterning and Maintenance Dept. 1324.

Harold joined Sandia's IC Process Development and Control Division in 1981, working on product engineering for CMOS integrated circuits and developing software for a wafer level parametric test system. He transferred to the IC Technologies Division in 1983 and was technology engineer for CMOS integrated circuit technologies. He helped transfer Sandia-developed IC technologies to the Allied Signal-Albuquerque Microelectronics Operation. In 1986, he joined the IC Pattern Transfer Division, developing plasma and reactive ion etch processes for silicon IC fabrication. In 1991, Harold went to the Silicon Technologies Division and was project leader for CMOS technology development in the Microelectronics Development Laboratory.



HAROLD STEWART

He has a BS and an MS in electrical engineering from UNM.

Harold enjoys volleyball and racquetball. He lives in the NE Heights.

ROBERT THOMAS to Manager of Solid and Structural Mechanics Dept. 1562.

Bob joined Sandia in 1977 as a member of Applied Mechanics Division I. He developed material constitutive models to predict the mechanical response of volcanic tuffs at the Nevada Test Site to the emplacement of high-level nuclear waste. He was on a nine-month assignment during 1982 in the Future Options Group, working with a team studying the feasibility of microwave-directed-energy weapons. In 1984, he joined the Anti-Submarine Warfare Mechanical Division. He transferred to the Penetrator Weapon Development Division in 1987, working on countermeasures to earth-penetrating weapons, and joined Applied Mechanics Division III in 1989, working on computational models for the B90 energy-absorbing nose and on nuclear weapon safety programs.



ROBERT THOMAS

Bob has a BS in metallurgical engineering from the Colorado School of Mines and an MS and

PhD in mechanical engineering from the Polytechnic Institute of New York. He is a member of the American Society of Mechanical Engineers. Before coming to Sandia, Bob worked for General Electric in Schenectady, N.Y., and the General Atomic Company in San Diego.

He enjoys skiing, rock climbing, and karate. Bob lives in the NE Heights.

SANDRA SPRAGGINS to Manager of Integrated Program Process Dept. 9202.

Sandi joined Sandia in 1984 as a member of the Neutron Tube Development Division, where she



SANDRA SPRAGGINS

and another Sandian developed a user interface for an ion optics simulator on VAX and Cray computers. She transferred to the Space Systems Division in 1985, where she designed radiation-hardened application-specific integrated circuits for the Global Positioning Satellite and designed a silicon-on-silicon multichip module for potential satellite applications. Sandi's primary work experience is in design for test methods, radiation-hardened technologies, advanced packaging, and component engineering.

She has a BS in electrical engineering from New Mexico State University and obtained an MS in electrical engineering from the University of Arizona through Sandia's One-Year-On-Campus Program. She also has an MBA from UNM. Before joining the Labs, Sandi worked as a Sandia summer student in the Neutron Tube Development Division under the Associated Western Universities Program.

Sandi enjoys skiing, volleyball, gardening, running, and "restauranting" (exploring ethnic cuisine). She and her husband Tom Pratt (1934) live in the SE Heights.

STANLEY HARRISON to Manager of Site, Civil, and Utility Design Dept. 7945.

Stan joined Sandia in 1986 as a member of the Utility and Special Systems Design Division, where he did electrical utility design. He was a member of the Facilities Electrical Standards Committee and was a consultant to users needing special power requirements. He designed a project to modernize the Steam Plant control system and prepared a conceptual design report for modernizing Sandia, Albuquerque's power system. He was a consultant to DOE/AL on electric power issues including the PNM service agreement.



STANLEY HARRISON

Stan has a BS in electrical engineering from McNeese State University. He is a member of IEEE and its Industrial Application Society. He is a registered professional engineer in New Mexico and Texas. Before coming to the Labs, Stan worked for the Southwestern Public Service Company in Lubbock, Tex., and Dresser Industries in Houston.

He enjoys golf and camping. Stan and his wife Cindy have two children and live in NW Albuquerque.



Sandia News Briefs

New Technique Offers Dramatic Reduction in IC Troubleshooting

Sandia researchers have developed a procedure that reduces from weeks to minutes the time needed to pinpoint a defect that often impairs integrated circuits. The system, developed by Ed Cole Jr. of Failure Analysis Dept. 2275 and Rich Anderson, Manager of 2275, is called Charge-Induced Voltage Alteration (CIVA). It uses a scanning electron microscope to find tiny cracks that interrupt current flow and cause IC failure. The cracks usually are about one-billionth of a meter in breadth. CIVA images are produced by monitoring voltage fluctuations of a constant current supply as a microchip surface is scanned by an electron beam. Variations in the current are produced only at an electrically open, or cracked, point on the conducting path. The technology has already been transferred to private industry for use in failure analysis labs.

Zimmerman Named New Mexico Engineer of the Year

The New Mexico Society of Professional Engineers named Roger Zimmerman of Environments Engineering Dept. 2741 the New Mexico Engineer of the Year. The award was presented during the group's annual meeting in Santa Fe last month. Roger was commended for his work as president of the Albuquerque chapter during the past year. The citation says his work "fostered the development of new initiatives in the training of young engineers, greater political action, and the addressing of infrastructure needs for the state and community."

Ion Beam Patterning Expands Potential for Light-Emitting Silicon

Three Sandia researchers have developed a novel patterning technique that could lead to, among other applications, new types of flat panel displays like those used in laptop computer screens. They found that by irradiating portions of porous silicon wafers with an ion beam, they can manipulate both the location and intensity of photoluminescence, and thereby control the emission of red light from silicon semiconductors. Their work is one of numerous recent advances in efforts to get silicon to emit visible light. The research was conducted by Charles Barbour of Ion Solid-Interactions Dept. 1111, Mike Kelly of Process Characterization Dept. 1824, and Terry Guilinger of Ceramic Processing Science Dept. 1841.

Carne Named Associate Editor of Modal Analysis Journal

Tom Carne of Experimental Mechanics Dept. 2741 has been named associate editor of the *International Journal of Analytical and Experimental Modal Analysis*. The journal is published by the Society of Experimental Mechanics. Among Tom's duties with the journal will be evaluating articles for possible publication and obtaining technical reviews of them.

Sandia Gets First Component Built of AT&T Vendors' Parts

Sandia got the first Allied Signal printed circuit assembly built of parts from AT&T vendors (LAB NEWS, Feb. 21) in June, and Ray Reynolds, Manager of Use Control Program Office 5702, says the assembly worked on the first try. The significance of this, Ray says, is that there was no incoming pretest of the components or testing of the assembled board. The assembly was designed by Sandia and Allied Signal employees for an Air Force secure recode system used by the Strategic Command to implement advanced PAL (permissive action link) codes management techniques in its stockpile. Use of the specified AT&T components reduces the cost of the assemblies, Ray says. Members of the team that implemented the program are Sandians Bob Baker (5702), Janet Bauerle (5712), Al Farmer (2612), Jim McKenney (2271), and Janet Sjuln (335); Lavern Chesnut, Lee Hoover, and Randy Schaldecker of Allied Signal; and Keith Smithson of DOE.

Four High School Teachers Doing Summer Research at Sandia

Four outstanding high school math and science teachers from Iowa, Louisiana, Nebraska, and Utah have been awarded DOE summer research appointments at Sandia. Patricia Salisbury of Diversity Leadership Center 611 says the appointments, made through DOE's Teacher Research Associates Program, are granted in recognition of sustained contributions to teaching. The eight-week session will include classes, seminars, and other opportunities for the teachers to sharpen their math and science skills, and each will create an instructional package to take back to his or her home school to share with colleagues and students.

The teachers are Arlene Cain of Sam Houston High School in Lake Charles, La.; Ronald Crossman of Bingham High School in South Jordan, Utah; David Dunclee of Waukon Senior High School in Waukon, Iowa; and James Russett of Bellevue East High School in Bellevue, Neb. All four will work in Sandia's Pollution Prevention and Environmental Monitoring organization, helping to develop waste minimization assessments for Sandia.

Rodriguez Passes Exam, Named 'Certified Legal Assistant'

Berta Rodriguez (210) has been notified that she passed the two-day examination to qualify as a Certified Legal Assistant. The exam consists of seven sections addressing substantive law matters, legal research, and general skills — communications, judgment, analytical ability, interviewing, and legal terminology.

Send potential Sandia News Briefs to LAB NEWS, Dept. 7162.

Take Note

A Household Hazardous Waste Collection Center is now open to Bernalillo County (including Albuquerque) residents for household hazardous waste disposal. The Center, located at 6133 Edith NE, is open Fridays from 8:30 a.m. to 4:30 p.m. and Saturdays from 8 a.m. to 3 p.m. During the winter months, the Center will be open one weekend each month. Household hazardous wastes that can be disposed of at the Center include paint, paint thinner, used motor oil, caustic cleaners, pool chemicals, insecticides, herbicides, etc. Wastes should be brought in original disposable containers and cannot be dropped off on days other than Friday and Saturday. Items not accepted

include non-hazardous, radioactive, and biomedical wastes, compressed gases, and explosives and ammunition. Residents are required to provide their names, addresses, and phone numbers, and to certify that they are residents of Bernalillo County. Business waste cannot be accepted. For more information, contact the Albuquerque Environmental Health Department on 768-2600.

PDP Dentist Change

Dr. G. C. Clark, 3613 Rio Rancho Blvd., Corrales, N.M., is no longer participating in the Preferred Dental Plan network. Please delete him from your PDP Directory.

feed back

Q: With the present post and bid system, candidates take the time to apply and interview for a position, but (in my opinion, an amazing lack of personnel etiquette) the Sandia system apparently does not require the courtesy of notification to those candidates not selected for a position. The only way one finds out about his or her non-selection is by word of mouth — someone else has been appointed to the position.

Could Sandia not raise its level of professionalism by comparing its personnel practices with those of other companies, and change its promotional selection process to include notification of non-selection as well as that of selection?

A: Thank you very much for your comments. All managers should refer to Chapter K of the Sandia Personnel Manual. Chapter K, "Selection Guide" currently states, "Unsuccessful candidates should be told by the selecting supervisor that they were not selected and something about how they may improve their competitive chances in the future. This may be accomplished in any practical way, for instance, by phoning or personally contacting each candidate, or at least those interviewed."

In addition to the Personnel Manual, selecting managers receive selection guidelines from General Employment & Staffing Support Dept. 7533, which state, "As a courtesy, the selecting supervisor is encouraged to contact unsuccessful candidates as a means of providing feedback. The number of bidders may preclude personal contact with all candidates. However, all candidates interviewed should be contacted immediately after the selection has been certified."

Personnel representatives are also available and serve as a valuable resource to provide guidance to managers. We hope your inquiry will serve as a reminder to managers that when making selections, the successful candidate should be notified first, but unsuccessful candidates should be notified immediately afterward.

Ralph Bonner (7500)

Q: I realize that it would be best if I always use FTS. Unfortunately, sometimes it just isn't possible — trunk lines tied up, line quality when data is being passed, overseas calls, etc. Until recently, when I had to go commercial, I could simply dial 9+1+ and things worked fine. Now, because someone has made some broad, sweeping policy on this, I have to call 9+0+ and then charge it to my telephone credit card. This clearly costs SNL and my customer more. How do I reconcile this with our desire to be more efficient and responsive.

Who's responsible for this change, when did it occur, and how do we reverse it: Don't tell me it's DOE policy — I know about that, but no policy requires such blanket implementation. If I misuse commercial privilege, fire me, but don't unnecessarily impede my job.

A: You are correct that since early 1990, all domestic toll calls are routed through FTS 2000. If all FTS 2000 trunks are busy or out of service, the call is automatically routed to the commercial network. Sandia uses FTS 2000 according to DOE Order 1450.3. The FTS 2000 voice system, supplied by AT&T, is the least-cost option and has proved to be more reliable than commercial long distance.

If you are having problems, please give us an opportunity to help by contacting Fred Jones of Communications Dept. 1955 on 5-8666 or the Livermore AT&T on-site technician on 294-3875. To make an international call, you should dial 9-011+country code+local number. A credit card is not necessary for official business calls. These instructions are in the pink pages in the front of the Sandia telephone directory.

Dona Crawford (1900)

MILEPOSTS

LAB NEWS

July 1992



Bob Lindsey
2414 35



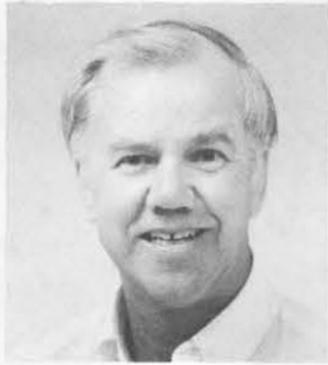
Pete Royval
8445 20



Bob Peet
2732 40



Joseph Keiner
361 35



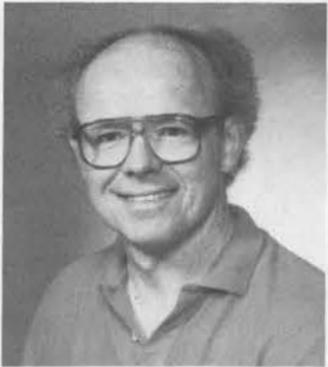
David Skogmo
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Lorena Schneider
8523 40



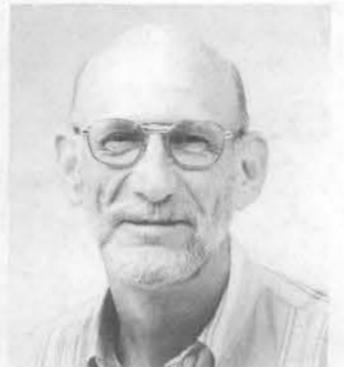
Charles Gebert
1315 35



Don Osbourn
8441 25



Barbara Combs
8532 15



Mark Percival
9249 25



Lyle Whelchel
7201 35



Pete Asprey
8525 15



Florindo Salas
9322 30



Ron Greene
9814 15



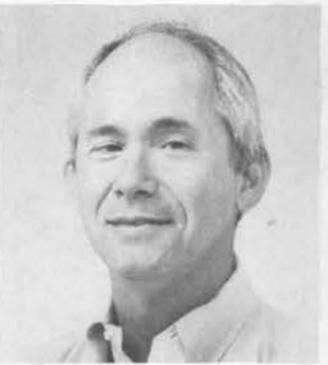
John Crawford
8000 30



Bill Hale
9249 30



Allen Stanley
7715 25



John Finger
6111 30



Ileen Jogi, William Rose
7614 15



Del Houser
8284 30



Dwight Jennison
1114 15



John Guth
7712 30



Leroy Sparks
361



Gina Simpson
1823 15



Dale Breeding
9236 30



John Covan
6903 15



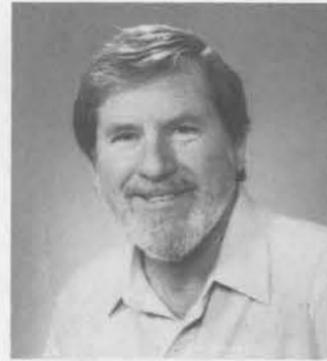
Tommy Donham
2601 35



Kazuo Oishi
5161 30



Gene Marquez
7442 15



Ron Allen
8532 30



John Stichman
2600 20



Betty Gatto
7544 35



Curt Cofield
8451 25



Eugene Church
331 35



Jackie Garrett
8643 30



Daniel Thompson
7715 25



Harold Spahr
1551 35



Glenda Muir
8453 25



Paul Longmire
5407 30



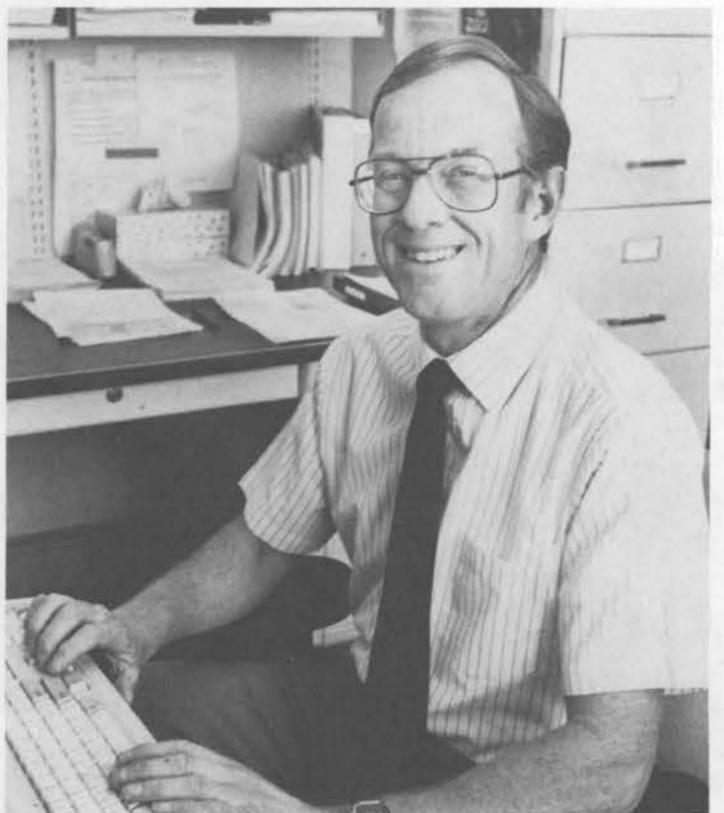
Sallie Renter
8534 15



Thomas Evans
2313 30



Vern Barr
8453 25



Robert Rieden
2604 30



Joe Ambrulevich
8532 25



Chuck Oien
5375 15



Dannie McNeill
9811 20

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 7162.

Ad Rules

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

MISCELLANEOUS

TRUNDLE BEDS, 39" x 75", steel frame, metal springs, wood head & foot boards, \$100. Coalson, 298-0061.

WATERBED, complete, w/rails and sheets, \$100; 2 recliners, 1 green, 1 brown, \$50/ea.; washer & gas dryer, \$200/set. McClafflin, 292-3543.

DISPLAY CASES, 6' x 2' deep, standard height, w/4 glass shelves & brackets, good condition, \$200/ea. Remschneider, 831-2906.

SAXOPHONE, Bundy, E-flat, alto, \$150. Montoya, 296-4268.

WEIGHTS, GYM PAC 1000, bench, all accessories, extra weights to 198 lbs., \$100. Bouchard, 265-8148.

RELOADING, Redding Scale, great condition, \$15; 12 MEC Grabber, \$130; 12G Pacific DL155, \$35; 20G & 28G hand loaders, \$8/ea. McConkey, 275-6636.

CRIBS, 1 Jenny Lind, w/mattress, \$80; 1 Brown w/mattress, \$65; both in good condition. Potter, 299-6053.

ELECTRIC HOSPITAL BED, \$750; electric liftchair/recliner, \$450; wheelchair, \$175; bedside commode, \$35; walkers, \$25/ea.; recliner, \$150. Worley, 298-4039.

TWO STATIC WHEEL BALANCERS, \$5/ea.; 1/4-hp motor, \$6; gasoline camp stove, 2-burner, \$15; 1 box TV tubes, \$5. Hayes, 299-1200.

STEALTH SHOTGUN (Winchester Defender, 12 ga.), \$180; motorcycle sidebags, thick leather, formed, \$80; bunk beds, homemade, solid wood, \$180. Kemp, 281-5714.

MINIATURE DACHSHUND, purebred, black & tan female, very affectionate, great with children, needs a good home. Willette, 271-2095.

FRANKLIN WORDMASTER WM-1055, 496K synonyms, 77K thesaurus definitions for 40K entry words, word games, \$50. Webb, 828-2271.

DRESSES, formal (all floor length), sizes 12, 13, and 14, all excellent condition, \$15-\$25 ea. Oglesby, 296-5361.

TRAILER VENDING, \$3,500; Tandy 2000s, 10-Meg. color, 20-Meg. monochrome, dot-matrix daisy-wheel programs, \$500 ea. OBO. Kidd, 281-3005.

WEIGHT BENCH, w/leg extension, barbell, & weights, \$125. Dale, 291-9020.

REFRIGERATOR, almond, almost new, icemaker, \$375; seafoam green carpet, 150 yds; best offer. Kallio, 299-8837.

SPIRAL STAIRWAY, Yost Ornamental Iron Works, 4' diam. x 10' to platform, cost \$1,000 new, sell for \$550. Pitts, 293-5481.

LAWN MOWER, 18-in. Black & Decker, very good condition, \$60. Gendreau, 268-3436.

AREA RUG, 8 x 10, brown/beige, \$125. Follstaedt, 299-5941.

DIVAN & TWO CHAIRS, western styling, \$150; solid maple desk, \$250; laminated oak desk, \$75; microwave oven, \$100. Wehrle, 299-2959.

ELECTRIC LAWN MOWER, Black & Decker, 18-in., twin-blade, \$30. Hudson, 884-7621.

WALL UNIT, floor-to-ceiling, 80"L x 93"H, 2 pieces (base and shelves), walnut-stained birch, \$85. Letz, 293-4525.

MINIATURE POODLE, pure-bred, 9 yrs. old, loves to play ball, affectionate companion, needs good home. Hagerman, 275-3326.

PACKING BOXES, all sizes, 50¢-\$2 per box (packing paper included). Garcia, 281-4579.

DRUMS, CB700, Simmons electric/control deck, Ludwig snare, Paiste Rude hi-hat, Zildjian splash, DW-5000 double-base pedal, speaker box. Wicker, 888-4367.

CHROME SPOKE RIMS, 12" x 15", fit 5-lug Fords, \$50; Somma waterbed mattress system, \$100. Nelson, 881-0148.

WINDSURFING HAWAII gorilla mast base extension and cup, \$35. Horton, 883-7504.

REAR PICKUP BUMPER & corrugated tin, 400 General Patch NE, free. Carrillo, 296-7461.

TWO SHEEP DOGS, need home, father & son, 2-1/2 & 1 yr. old, neutered, all shots, very affectionate, great w/kids. Rex, 344-6552.

GAS FURNACE, Payne, 135,000-Btu input, 65"H x 24"W x 28"D, forced-air down draft, operation & maintenance manual, \$150. Trump, 299-5162.

STARCRAFT STARLITE CAMPER, 19-ft., sleeps 6 (5 comfortably), w/drapes, 3-burner stove, electric water pump, heater, battery pack, \$3,000. Hansen, 883-7137.

CUSTOM RECURVE BOWS: one 60-lb., \$275; one take-down, 2 sets of limbs, \$350. Anderson, 298-1635.

FULL-SIZE BOX SPRING & mattress, includes frame w/headboard & footboard, blonde-colored pine wood, \$60. Beer, 828-2755.

WHITE WATER RAFT, 10-ft. American camper, bought in March, \$400 firm. Normann, 291-1860.

LUGGAGE CARRIER, roof-mounted, for 8-ft.-wide RV, w/ladder, needs minor repair. Tockey, 822-0358.

NEW CUSTOM WEDDING SET: engagement 0.78 carats flanked by two 0.15, ideal cuts, VSI-1H color, appraised at \$8,330, sell for \$5,500 OBO. Evans, 292-2367.

STROLLEE BOOSTER CAR SEATS (4), velour, \$25/ea.; Camry car bra, \$10. Sweeney, 247-4866.

AT&T PC, w/IBM Proprinter, monochrome monitor, dual floppies, \$350 OBO. Foty, 260-1747.

NUMARK STUDIO MIXER, Model DM-1000, 2 phono inputs, 2 microphone inputs, amplifier outputs, fader, cue, & talk features, \$150. Harrison, 897-0658.

CEDAR FENCE BOARDS (50), 6-ft.; TV antenna w/10-ft. steel pole; dining set w/hutch; waterbed; more. Zipprich, 298-5943.

SINGLE SHOT PISTOL, Thompson Contender, 7mm TCU, w/dies, brass bullets, case, & extras, \$325. Ludwick, 296-6447.

CORNING COOKTOP, \$100; GE self-cleaning oven, \$200; Jenn-Air grill/griddle, \$100; Broan hood/light, \$40; clean & in excellent condition. Barnard, 256-7772.

BARBIE SECTIONAL DOLLHOUSE (3-piece), 3'H, 4'L, complete w/furniture, \$90. Newcom, 293-5180.

GOLF CLUB DRIVERS, Persimmon heads, Power-Bilt Citation, McGregor Eye-o-Matic, Spaulding Top Flt., \$50/ea., 2 graphite, Mizuno Daiwa, \$50-\$70. Stang, 256-7793.

ETHAN ALLEN HIDE-A-BED, \$200; wrought-iron pedestal table & 4 chairs, w/white cushions, \$175. Caldwell, 299-6361.

PIANO, \$800; bedroom set, \$200; sofa bed, \$200; recliner, \$100; 4-drawer chest, \$40; TV, \$75; tables, chairs, misc. Daniel, 268-8335.

EXTERNAL MODEM, 1,200-baud, cable for IBM-PC or Commodore C64 computers, cost \$168 new, sell for \$40. Hale, 298-1545.

PUPPIES, 6 wks. old, large good-looking mutts, free to loving, suitable homes. Moore, 281-2480.

ELECTRIC RANGE, self-cleaning, almond color, good condition, \$125. Ricco, 828-1997.

ROWING MACHINE, DP 3300, like new, \$25. Blackburn, 293-5978.

AMATEUR RADIO GEAR: HF transceivers, VHF hand-helds, accessories, junk, dismantling station. Lambert, 293-8825.

RATTAN & GLASS DINING SET: rounded table, 4 chairs, white cushions, excellent condition, \$250. Bjornberg, 281-1922.

YELLOW NAPE PARROT, excellent talker, \$1150 OBO. Babcock, 299-3121, leave message.

EQUALIZER HITCH TORSION BARS, 2 sets, Class A, \$40 & \$50; electric trailer brake control, \$20; storm door, \$20. Lindsay, 881-0709.

VW VANAGON BRA, new, fits '88-'91 models, half price; used golf balls. Prekker, 892-4107.

KODAK 4400 SLIDE PROJECTOR, w/Da-Lite screen. Nunziato, 823-2053.

UTILITY TRAILER, 2-wheel, 3-1/2' x 8', enclosed canvas top, 15-in. tires, w/spare, 2 tail lights, licensed, \$200. Harris, 255-6577.

LANDSCAPE BOULDERS, 2-person-size & smaller, couple dozen, purple & rust colored, free. Mauldin, 293-3763.

QUEEN-SIZE SLEEPER, \$400; GE upright freezer, \$200; Eureka canister vacuum, w/attachments, \$150; all in excellent condition. Jaramillo, 296-7516.

OAK TV/VCR STAND, \$40; oak stereo cabinet w/glass doors, \$150; flagstone, best offer. Lott, 296-8071.

BIKE CHILD SEAT, \$10; Panasonic turntable/tuner, \$30. Cotter, 897-1470.

TRUCK CAP, Glasstite, for Toyota pickup w/slanted rear window, black, \$200. Tomlin, 293-0004.

SHOTGUN, Wards Westernfield, 20-ga., pump-action, Select-A-Choke, \$125; ionizing air cleaner, \$25; 9-in. Big Wheel, \$5. Parson, 291-8394.

OUTBOARD MOTOR GAS TANKS, 6-gal. capacity, 2 Johnson, 1 Mercury, \$15/ea. Patrick, 265-4569.

SCHWINN AIRDYNE EXERCYCLE, \$450. Lukens, 299-1271.

GARAGE SALE: lots of good stuff, Sat. & Sun., July 11 & 12, 3833 Shenandoah NE. Roherty-Osmun, 293-8127.

INKLE LOOM, box type, \$35; spindle, perfect balance, \$25; 2 wood carders, \$10/ea.; yarn winder, \$15, plus free wool. Strance, 298-0258.

FOLD-DOWN CAMPER, '89 Jayco Cardinal SD, excellent condition, 19-ft., dual axle, many options, storage areas, \$6,850. Fernandez, 298-9715.

'83 KOUNTRY AIRE FIFTH WHEEL, 35-ft., AC, washer/dryer, additional freezer, microwave, propane-powered generator, power jacks, more, \$14,500. Shipp, 281-1997.

LAVA ROCK, free; 2 large yucca plants, free; you haul. Whelan, 255-3529 after 5 p.m.

TRANSPORTATION

'74 VOLKSWAGEN SUPERBEETLE, orange, new tires, good interior, reliable, \$1,950. German, 247-2298.

Feeling Rejected? Please Follow the Rules

Some "unclassified ads" are rejected because they do not meet requirements. LAB NEWS staff members do not have time to call people who submit ads, so non-qualifying ads are rejected *without notice*. The most common reason for rejected ads is that Sandians do not list their full names and organization numbers; this information is not printed, but it is necessary to verify that the ad was submitted by a Sandian. The rules are printed at the top of this page in each issue, and Sandians are encouraged to clip and save a copy.

'86 MERCURY LYNX XR3, 5-spd, cruise, AC, AM/FM cassette, tilt, 4-cyl., EFI, engine damaged, \$2,200. McClafflin, 292-3543.

'90 LINCOLN CONTINENTAL, 35K miles, white w/light-gray leather interior, excellent condition, \$16,300. Bronkema, 821-2119.

'68 DODGE PICKUP, 3/4-ton, w/Mitchell camper, needs work, \$1,000. Butler, 299-5626.

'90 EAGLE TALON, red, 5-spd., turbo, AWD, all available options, excellent condition, still under warranty, \$12,950. Remschneider, 831-2906.

SCHWINN BIKES: woman's 10-spd., \$150; man's 5-spd., \$50. Cotter, 897-1470.

'87 HONDA CIVIC HATCHBACK, 70K miles, good condition, \$2,400. Williams, 266-6552.

'86 THUNDERBIRD, mechanically excellent, body & interior excellent, high miles, 1 owner, \$3,000 OBO. Sturgeon, 281-9035.

'79 BROUGHAM MINIMOTORHOME, 21-ft., good mechanical condition, \$5,000 OBO. Hughes, 265-1698.

ATV, 4-WD, 4-passenger, Tecumseh air-cooled engine, 2-spd. reverse, new battery, 15-in. wheels, 1413 Guayas NE. Houghton, 299-3386.

'86 NISSAN 300ZX, 83K miles, 5-spd., T-tops, cruise, AM/FM cassette, new paint, \$6,995. Irwin, 291-9382.

'76 DIAMOND MINIHOMER, 20-ft., 440 engine, 2-way refrigerator, awning, 47K miles, \$5,800 OBO. Hole, 268-8246.

'70 MGB, 2 tops, roll bar, new tires, brakes, etc., \$3,000 OBO or trade small 4x4. Anderson, 298-1635.

'73 VOLKSWAGEN BUG, w/2.1L, dual carburetor kit engine, new paint, partially new interior, \$2,200 cash. Leisher, 281-5258.

'84 DODGE RAM 250 MINIMOTORHOME CONVERSION, 37K miles, Cooper tires, self-contained, excellent condition, \$13,500 OBO. Miller, 281-3189.

FRENCH TANDEM BIKE, \$850 OBO. Babcock, 299-3121.

BOY'S 18-IN. BIKE, black/silver, good condition, \$50. Follstaedt, 299-5941.

CHILD'S 16-IN. BICYCLE, \$30; 12-in. bicycle, \$20. Hudson, 884-7621.

WOMAN'S SCHWINN CLASSIC, balloon tires, 1-spd., w/basket, saddle seat, \$50. Letz, 293-4525.

GIRL'S BIKES: 16-in., \$30; 20-in., \$40. Sweeney, 247-4866.

'72 OLDS CUTLASS SUPREME, 2-dr., AC, AT, AM/FM, mag wheels, excellent condition, 121K miles, 1 owner, best offer over \$3,990. Fienning, 298-0743.

GIRL'S SCHWINN BICYCLE, Caliente, 24-in., red, w/bell, excellent condition. Wagner, 823-9323.

'91 NISSAN SENTRA, like new, red, great sound system, AM/FM/CD, \$1,700 below book, \$7,300. Anthes, 281-0834.

'90 HONDA ACCORD LX, 4-dr., AT, 23K miles, \$11,700. Chapman, 292-1198.

'85 FIREBIRD 500 LIMITED EDITION, low miles, original owner, AC, V-8, AM/FM cassette, must see to appreciate, \$4,495. Accardi, 344-7755.

'92 SATURN SL2, 4-dr., AT, AC, PW, PL, tilt, cruise, AM/FM cassette, power sunroof, warranty, 12K miles, \$12,300. Torres, 898-2641.

'63 FORD GALAXIE, 4-dr., 390 V-8, AT, PS, PB, new brakes, tires, 2-tone paint, white/blue, refurbished inside & out, \$4,500 OBO. Stang, 256-7793.

'77 PACE ARROW MOTORHOME, 25-ft., Class A, generator, roof AC, awning, Dodge 440-3, 70K miles, 4 beds, \$9,950. Ludwick, 296-6447.

'73 DODGE HIGH-TOP CAMPER VAN, new upholstery & carpet, looks good & runs well, good tires, 80K miles, \$3,000. Waldorf, 836-0642.

'74 SAAB 99, new clutch, rebuilt transmission, 4-spd., 2-dr., blue, clean, well-maintained, runs great, \$1,400. Caldwell, 299-6361.

'88 DODGE CARAVAN SE, cruise, captain's seats, AM/FM, AC, very clean, \$8,500. Dillon, 256-0076.

'79 OLDS CUTLASS BROUGHAM, AT, AC, PS, PB, excellent condition, well-maintained, 1 owner, \$1,350. Navratil, 293-5527.

MAN'S HUFFY BICYCLE, 26-in., 5-spd., blue, front/rear caliper brakes, high-pressure tires, like new, \$65. Giachino, 821-6351.

'81 DATSUN B310, hit in rear, drive-able, excellent motor, AC, radio, \$500. Ferguson, 292-3824.

'83 GREGOR ALUMINUM BOAT, 14-ft., 15-hp Suzuki motor, '89 EZ Loader trailer, lots of extras. Miller, 883-0218.

'84 CHEV. CORVETTE, standard 4 + 3, w/ new overdrive transmission and clutch, CD player, removable top, 68K miles, \$10,900. Blackledge, 294-6030.

REAL ESTATE

3-BDR. MANUFACTURED HOME, Edgewood, 5 acres, 2 baths, 2-car garage, private well, fenced backyard, horses okay, \$79,900. Shad, 764-5523 day, 275-2890 evenings.

3-BDR. HOME, 1,300 sq. ft., 1-3/4 baths, finished 2-car garage, great backyard, RV access, Taylor Ranch, near schools, \$72,500. Baca, 898-2244.

3-BDR. HOME, large lot, close to base, 1 bath, country kitchen, well-maintained inside & out, priced to sell, \$58,000. Silva, 298-8189.

3-BDR. HOME, 1-3/4 baths, 1,630 sq. ft., painted & sparkling clean, assumable non-qualifying FHA loan, Cherry Hills Loop, \$112,000. Anderson, 821-2920.

2-BDR. MOBILE HOME, '78 Charter, 12' x 54', recently remodeled, \$5,500. Smith, 275-2058.

WANTED

LAPTOP 80286 OR 8088, in good working condition; call evenings only or weekends. Murty, 857-9831.

OLD 1930s-1950s STYLE BICYCLES, Whizzers or parts, also Schwinn 5-spd. Stingrays. Callahan, 243-2491 or 242-2445.

SCHEMATIC DIAGRAM for Knight-Kit KG-683 (Allied Radio Shack 29-3986) VOM. Williams, 298-2624.

LIVE-IN PERSON to care for elderly woman, male or female, must be able to cook and hold a valid NM drivers license, good references. Walker, 268-5353.

ADULT SIZE ATV, 3- or 4-wheel; garden tractor w/mower and/or tiller; utility tractor w/3-pt. hitch. Kallenbach, 869-5237.

HOUSE for two ladies to either rent or house-sit for three to four weeks in July. Dow, 262-0014.

BICYCLE CHAIR, with harness for little one. Plank, 296-7919.

USED CAMPING EQUIPMENT, donations for use by Boy Scouts. Nava, 299-3017.

"OPPENHEIMER," 1980 BBC production aired on PBS stations in May 1982, starring Sam Waterston, need for school project. Keener, 255-8482.

RIDE-ON MOWER or small tractor w/cutting capability, other accessories okay. Kureczko, 281-8206.

NORITAKE CHINA, "Colburn" & "Adagio" patterns, also have Noritake "First Blush" pattern to sell or trade for "Colburn" or "Adagio." Iman, 299-6500.

SNARE DRUM, prefer Ludwig, not essential, must tune well, hold tune, good shape. Maes, 296-1641.

WORK WANTED

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

YARD WORK, teenager w/transportation needs yard work or odd jobs. Anderson, 298-1635.

HOUSESITTING, petsitting, plant care, child care, by experienced college student. Anthes, 281-8361, ask for Julie.



Coronado Club Activities**Tap Your Toes — It's the Isleta Poorboys**

YEE-HAAAA! The Poorboys are ridin' into town tonight, July 10, and there's gonna be a hot time at the old Club. The Isleta 'Boys will pick 'n' sing their crowd-pleasing western music from 7 to 11 p.m. To complement the entertainment, choose a 14-oz. T-bone steak (cooked just the way you like it) or scallops mornay for \$11.95, or mosey on over to the chuckwagon (OK, it's actually the buffet line) and pile your plate with all you can eat for \$6.95 — including baron of beef and chicken breast smothered in green chile. (Dinner served from 6 to 9.) Just the thing after a tough day herdin' them microchips and corralling them purchase requisitions. Reserve now at 265-6791.

POTENTIAL BOARD MEMBERS — If you're interested in getting your name on the ballot for the Club's Board of Directors, you have until Aug. 10 to submit your petition with the signature of 10 members. The ideas, suggestions, and dedication of folks like you are needed to keep the Club successful. Contact General Manager Sal Salas on 265-6791 for details.

TEMPORARY TEXANS — The Thunderbirds retirees group is sponsoring a trip to see the Texas Pageant August 18 and 19. It's a widely praised musical production, performed in Palo Duro Canyon, that portrays the lives of early settlers in the Texas Panhandle. The group will also tour the canyon and Amarillo. Cost is \$98 per person (double occupancy), including several meals. For more info, call Bob Butler (299-5626) or Art Hasenkamp (255-8946). Ask nicely, and maybe they'll also tell you about the Cumbres-Toltec railroad fall color trip in September.

JEMEZ OR BUST — The Roadrunners RV Club will travel July 20 through 23 to the new Jemez Falls campground in the Jemez Mountains near Redondo Campground. For information about this trip or the club, call President Tex Vandt on 293-1249 or Wagonmaster John Smelser on 256-3108.

ADVANCE WARNING — Pool and patio will be closed July 25 and 26 and will re-open at 5 p.m. Monday, July 27. The Club is hosting a swim meet.

Events Calendar

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

July 10 — Michael Chapdelaine, internationally renowned classical guitarist presents an all-Mexican program as part of the "Arts of the Americas" celebration; 8:15 p.m., Keller Hall, 277-2127.

July 10 — "American Salute," Santa Fe Desert Chorale, with a pre-concert lecture by Maestro Bandfield; 8 p.m., Sunshine Music Hall, 1-800-244-4011.

July 10-30 — Latin American Film Festival, featuring guest scholars, film makers, and screenings of outstanding films (subtitled in English); 7 p.m., UNM Main Campus and Student Union Bldg. Theatre, call for schedule, 277-6262.

July 10-Aug. 2 — Exhibit, "Peruvian Photography 1900-1930," Santa Fe resident Ed Ranney traveled to Peru to make prints from early 20th-century photographic negatives (many have never been seen in the US); 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

July 10-Aug. 16 — Exhibit, "Thanks for the Mimbres," how anthropologists and tourist promoters have transformed religious images into popular culture icons; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

July 10-Aug. 16 — Exhibit, "Our Land/Ourselves," works on paper by Native American artists focusing on the land and its inhabitants; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

July 11 — Victor Mendoza Sextet, vibraphonist and his sextet present an evening of Latin jazz music; 8:15 p.m., call for location, 277-2127.

July 11 — Summerfest: African-American Night, live entertainment, arts & crafts, children's activities; 5-10 p.m., free, Civic Plaza, 768-3550.

July 12 — Cuarteto Latin Americano, classical string quartet from Mexico, part of "Art of the Americas" celebration; 3 p.m., Woodward Hall, 277-2127.

July 12 — Sunday Jazz at the Zoo: featuring the Salsa Maria Orchestra and the Laney McDonald Trio; 2-5 p.m., Rio Grande Zoo, 255-9798.

July 12 — Arts in the Parks: "Remember When 50s," afternoon of family entertainment; 2-5 p.m., free, Inez Park (Virginia & Cutler NE), 768-3483.

July 12 — "Cielo Acustico," guitarists Hector Pimentel and Jorge Lucero perform a special "in-gallery" concert to celebrate the opening of "Unbroken Threads" exhibit; 7 p.m., Albuquerque Museum, 243-7255.

July 12-Oct. 18 — Exhibit, "Unbroken Threads: A Quincentenary Exhibition of Native American and Hispanic Art"; 9 a.m.-5 p.m. Tues.-Sun., Albuquerque Museum, 243-7255.

July 13 — Southwestern Pottery Activity for Children, children learn about different styles of Native American pottery through hands-on activities working with rock clay, sherd painting, etc.; 9-11 a.m., Maxwell Museum of Anthropology, 277-4404.

July 14 — Tuesday Night Garden Classes: "Iris

and Day Lilies — Summer Bloomers"; 7-9 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.

July 16 — Storyteller Allene Kleweno; 10 a.m., free, South Broadway Cultural Center, 848-1320.

July 16 — Feria De Los Niños: celebration of youth and the Mexican culture, live entertainment, artists; 10 a.m.-4 p.m., free, Civic Plaza, 764-1525.

July 17-19 — In-Gallery Demonstration by Navajo weaver Mary Sandoval of Crownpoint, 10 a.m.-noon & 2-4 p.m., free, Albuquerque Museum, 243-7255.

July 18 — Summerfest: Middle Eastern/India Night, entertainment, arts & crafts, food; 5-10 p.m., Civic Plaza, 768-3550.

July 18-19 — Madrid Latin Jazz Festival: Caribe Big Band, Victor Mendoza Sextet, Salsa Suite, Brazil, and others; call for times; Madrid, NM, 255-9798.

July 19 — Arts in the Parks: "Victorian Street Fair", afternoon of family entertainment; 2-5 p.m., free, Huning Highland Park (Locust & Silver SE), 768-3483.

July 21 — Tuesday Night Garden Classes: "Garden Photography"; 7-9 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.

July 23-25 — "Pinocchio," children's classic presented by the Albuquerque Children's Theatre; 10:30 a.m. & 1:30 p.m. Thurs. & Fri., 1:30 & 3:30 p.m. Sat.; Rodey Theatre, 898-6679.

Volunteer Opportunities

Summer can be a good time to become involved in community volunteer activities. Sandia's Volunteers In Action program

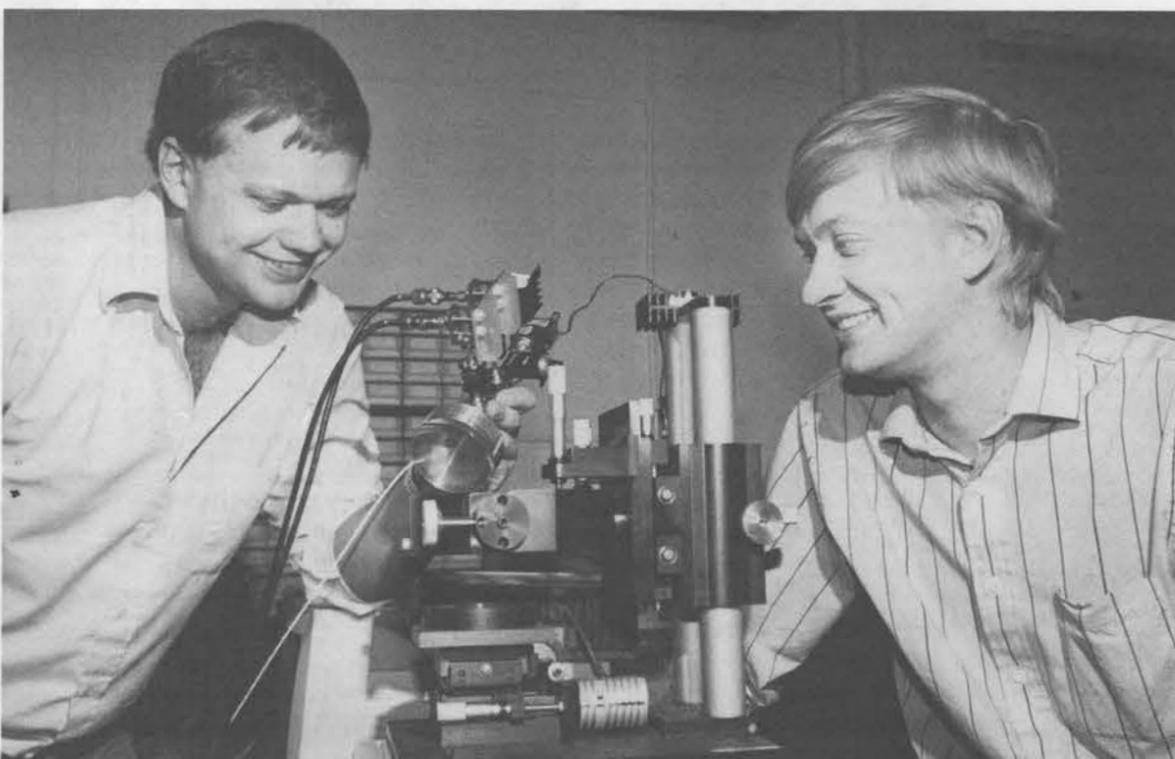
has received the following requests for help. If you are interested in any of these volunteer opportunities, call Al Stotts of Public Relations Dept. 7161 on 844-2282.

- Meals on Wheels, an organization that has been delivering meals to the homebound in Albuquerque for more than 20 years, needs volunteer drivers who can take a route on a regular basis. Training is provided.

- Safer New Mexico Now, an organization that promotes highway safety, needs consultation on preparing an exhibit for September's New Mexico State Fair. Mary Justice, director of the organization, says she wants to build an electronic display in the shape of New Mexico that will indicate the locations of traffic deaths and injuries.

- Albuquerque Literacy Program (ALP), a United Way agency dedicated to reducing the illiteracy rate, needs reading tutors and teachers of English as a Second Language (ESL). A basic reading workshop is held for volunteers that uses the "whole language" approach to teaching reading, writing, and spelling. Another workshop prepares tutors to work with adults whose native language is not English. Tutors do not need to be bilingual to volunteer for the ESL program. Full-time support is available to volunteers from ALP staff along with unlimited use of the ALP library.

- The local chapter of Youth for Understanding (YFU), an international student exchange program, is interviewing potential host families. Sandians can share an international experience by hosting a high school foreign student for the upcoming school year. YFU is one of the oldest and largest exchange programs and has 10 regional offices and an International Center in Washington, D.C. A network of 12 volunteers in New Mexico assists host families and their students.



ENABLING TECHNOLOGY? — Jon Martens (1154, left), Vincent Hietala (1322) and others recently developed a new technique for measuring surface resistance, a key parameter for determining the quality of conducting and superconducting materials, especially those used in high-speed or microwave applications. They believe the technique, which uses a device called a confocal resonator, may become an "enabling technology" for the emerging high-temperature superconductor industry. David Ginley (1154), Tom Zipperian (1322), a Wisconsin company, and a University of Wisconsin researcher contributed.