

# When a Comet Conks Jupiter, There's Gonna Be a Mega-blast

Next summer, a celestial snowball — a comet — will take a shot at the Solar System's largest planet. Jupiter will win that match by something more than a technical knockout. The question researchers are asking is not whether the comet has — well, a snowball's chance — but exactly what will happen during its demise.

A Sandia group is finding answers by using computer codes of the type originally developed to model nuclear weapon blast effects. Astronomers are definitely interested in what the Labs researchers have to say, says Mark Boslough of Experimental Impact Physics Dept. 1433.

The Solar System isn't a usual topic of Sandia research, but this upcoming collision offers a once-in-a-lifetime chance to test a computer simulation against a crash that's well beyond lab scale.

"Sandia has a launcher that gives impact velocities of about 12 kilometers per second," says Mark. "It's the fastest in the world for gram-sized objects, but this event will have a velocity of about five times that — not to mention 16 orders of mag-

nitude greater mass. So this is far beyond what we can simulate in a laboratory. It's a chance to further validate our computer codes by making a calculation that we'll be able to relate to an observable event."

The software used for the project is the Sandia-developed CTH code, which has been used for studies ranging from the origin of the moon to the possible detonation of weapons by accidental impacts (LAB NEWS, Sept. 4, 1992).

The Sandia group working on the comet crash— Mark, Tim Trucano of Computational Physics R&D Dept. 1431, David Crawford (1433), Marlin Kipp of Computational Physics and Mechanics Dept. 1432, and Mike McGlaun (1431 manager) — presented their interim results recently at the annual meeting of the American Astronomical Society's Division of Planetary Sciences.

Some astronomers have predicted that the impact will be one of the most spectacular celestial events ever recorded. Telescopes and spacecraft are

being rescheduled to observe the resulting display.

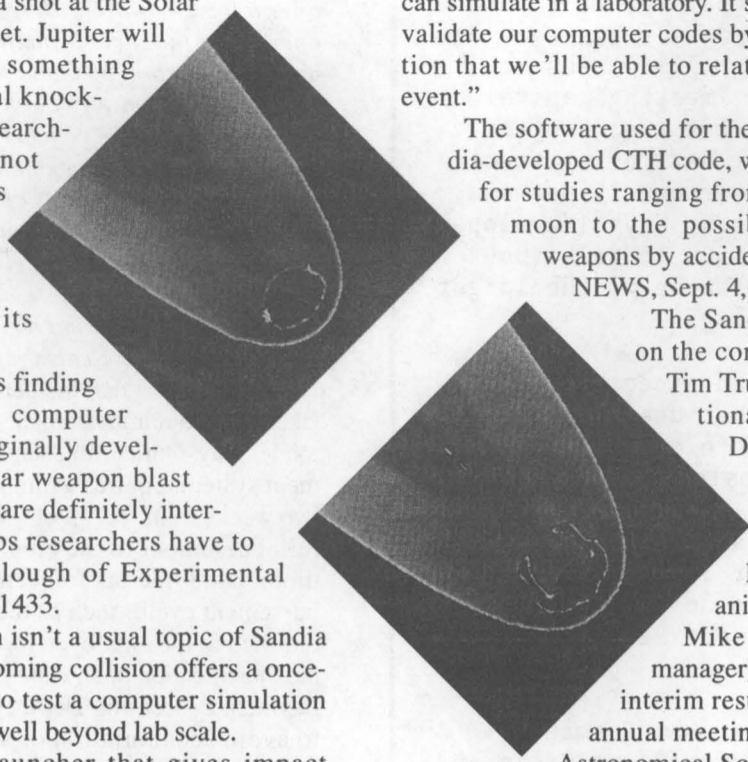
The comet poised to strike Jupiter is named Periodic Comet Shoemaker-Levy 9. It's already in several pieces, pulled apart by Jupiter's gravity field. The pieces, which have been compared to a string of pearls because of their in-line orbit configuration, are expected to begin their plunge into Jupiter in the latter days of July 1994.

### Time Scale of Seconds

"There was a lot of interest in our calculation," says Mark. "We're looking at the mechanisms that will cause the comet's fragments to break up and deform. That means we're concerned with scales of seconds. Others have studied only on time scales of tens or hundreds of seconds."

The Sandians have achieved more detail in modeling the collision than other researchers.

*(Continued on Page Five)*



**ROUGH RIDE** — The illustration at left depicts a half-second in the life of a comet fragment plunging into Jupiter's atmosphere. In the upper view, the 3-kilometer-diameter sphere of ice is 2 seconds into its collision with the giant planet; the lower view is at 2.5 seconds. The disintegration of the comet was modeled with a Sandia supercomputer. Shades of gray behind the comet fragment indicate different temperatures. Each view is 16 kilometers on a side.

# LAB NEWS

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## 'Outstanding Contributions' Recognized

### Sixteen Teams Honored with First Sandia President's Quality Awards

Five teams won Silver Awards, 11 won Turquoise, and 12 were cited for special recognition as Labs President Al Narath presented Sandia's first President's Quality Awards recently in a Technology Transfer Center ceremony televised live at Sandia/California.

"We and DOE's Albuquerque Field Office are

considered to be leaders within DOE in the move to Total Quality Management," he said. "And I'm happy to say that you and your presence here today are living proof that we have achieved concrete, highly visible results."

He said the Sandia President's Quality Awards were established to recognize Sandians for using quality principles to improve customer focus, process management, and results.

Al drew chuckles from the crowd when he said, "I suffered some anxious moments early on, wondering if there would be any worthwhile contenders. Well, I need not have feared."

He said he was particularly pleased with the large number of nominations — 86, with nominees ranging from one person to a team of 185 people, for a total of more than 1,200 people — and believes it indicates Sandia's commitment to quality.

"We recognize the importance of quality," he said. "Without it, we cannot consistently achieve Mission Success — the phrase Martin Marietta uses to describe its corporate approach to all of its undertakings."

### Silver Awards

Following are brief descriptions of the Silver Award-winning projects and the names of team members, with organizations (or other affiliations) in parentheses. Organizations are as of the date of the award nomination.

- Facilities Accelerated Systems Team — Formed the Manufacturing Facilities Department to support the Advanced Manufacturing Initiative, *(Continued on Page Four)*

## Supercomputing '93

### Labs' Demos Show Chips, Molecules, And Human Heart

"Come in and be a part of history." So said a sign outside a room in Sandia/New Mexico's Bldg. 880. Meanwhile, 2,050 computer-link miles away, on the bustling exhibit floor of the Supercomputing '93 conference in Portland, Ore., Sandians were busy making history — among them, Nick Testi and colleagues in Networking Department 1954, John Zepper of Computational Fluid Dynamics Dept. 1511, and Tom Tarman of Information Systems Development Dept. 9417.

The occasion was the successful demonstration of new state-of-the-art switching and networking technology at an enormous data rate — 155 million bits of information a second.

"It's huge. It's a digital monster pipe." That's how an AT&T engineer collaborating with Sandia

**"We've demonstrated voice, imaging, video, and data ... over the long haul. It's really a one-of-a-kind thing."**

and stationed a few feet from Nick on the floor at the Sandia exhibit described the optical-fiber-based network.

The experiment demonstrated the ability to use new ATM switching technology over SONET optical transmission facilities at 155 megabits per second with real production applications of video, data, and audio. ATM (it stands for asynchronous transfer mode) is a networking technology that allows users to mix voice, video, data, and images into the same bit stream. SONET is the optical network that transmits all these data streams at multi-megabit rates. As Nick says, the ATM "doesn't care what the information form is. All the data are converted into a single stream."

According to Steve Gossage (1954), this was the largest, fastest multimedia experiment yet that used ATM, SONET, and interoperability in a production telecommunications environment.

"It's very new, state-of-the-art technology," *(Continued on Page Six)*



A HANDSHAKE from Labs President Al Narath goes along with Georgianne Smith's (4302) President's Quality Award, presented at the Technology Transfer Center in Nov. 19 ceremonies televised live to Sandia/California.



## This & That

**Meeting Meter** - My retired Sandia boss used to say too many people spend \$10 to solve a nickel problem. That came to mind as I was reading a short *U.S. News & World Report* item that Judy Crane (7151) sent me. Remembering that I once said that Sandia must be the "meeting capital of the world," Judy sent me an article discussing a new computer program called "Meeting Meter" that dramatizes meeting costs. "At the start of a meeting," the article says, "participants type in their hourly pay. As the meeting drags on, the meter adds up the labor costs. Says [developer Barnard] DeKoven, 'If you realize you've just spent \$500 to talk about a \$50 purchase, it helps put things in perspective.'" Maybe we should get these things listed in the Sandia office supply catalog.

\* \* \*

**As Traditional as Turkey** - One of the oldest and nicest holiday traditions at Sandia is the Shoes for Kids program that uses employee donations to buy shoes for less-fortunate Albuquerque elementary school students (students are chosen by teachers and principals). As we noted in the last issue, donations are accepted in any amount, but \$26 will buy a sturdy pair of shoes that should last a child about a year. The program is sponsored by employees in Surety Assessment Center 12300 and Defense Programs Div. 5000, and there's still time for you to help this year. Make checks to Shoes for Kids and mail them to Liz Scott-Patterson (5501) at Mail Stop 0461 to arrive by Dec. 10.

\* \* \*

**A "Rock Star," Too** - Just after LAB NEWS Writer John German finished his story in this issue about contract employee Evans Craig and his work with young Native Americans, Evans' Sandia Manager Del Klinetobe (2881) called with an interesting story about Evans. Nearly 10 years ago, Evans used to walk his dog in the area now known as Albuquerque's Petroglyph National Monument. Dismayed by trash dumped among the rocks and vandalism to the ancient scrawls, he began taking photos of the petroglyphs, which he touted at city council meetings. When he suggested fencing off the area to protect it, council members referred him to the group New Mexico Volunteers for the Outdoors. Several years and volunteer projects later, the petroglyphs were made into a national monument. That's but one example of the fine things this busy fellow has helped accomplish. Read more on page seven.

\* \* \*

**Indelicate Writing on the Wall** - A New Mexico Sandian who prefers to remain anonymous wonders why the signs in some Sandia men's rest rooms state: Please "Flush" Urinals. "Why the italics and quotation marks?" he asks. "Is this [flush] an indelicate verb? Are there analogous signs in the women's rest rooms?" Then he adds, "Any 'illumination' would be appreciated." Well, Mr. Anonymous (aka Bob), I don't have the "foggiest" idea, especially that part about signs in the women's rooms. Readers?

\* \* \*

**Helpful Holiday Hint** - As the holiday gift-giving season approaches, some free advice that I served up for Sandia men a while back may be worth repeating: When selecting gifts for your wife or girlfriend, to keep the spark in your relationship never buy her anything that plugs in. Also, when shopping, if you spot something that slices or dices, you're definitely in the wrong department, brother! •LP

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**MARTIN MARIETTA**

### How to Find Out 'Weather' There's a Sandia Work Delay

New Mexico Sandians are reminded that the Labs seldom shuts down or alters its work schedule because of snow or other bad weather. Employees should not assume that Sandia work hours have been altered just because they hear other groups have done so, including Kirtland Air Force Base.

If Sandia officials decide to alter normal beginning work hours, a Labs spokesperson will notify primary Albuquerque radio and television stations as early as possible. Employees may also dial Sandia Line on 845-6789, punch 9 for the quick dial code, then punch 9999#. If work hours are altered, there will be a message to that effect.

### Sympathy

To Virginia Grossman (6111) and Robert Reese (7001) on the death of their father in Billings, Mont., Sept. 11.

To Gordon Smith (6606) on the death of his father in Indiana, Nov. 5.

To Jim Wolcott (12332) on the death of his mother in Lakeworth, Fla., Nov. 15.

## feed feedback

*Q: I can understand why the SLIs require an employee to submit a voucher as soon as possible after a trip. However, why doesn't the corporation operate on the same principle? Voucher payments appear to be running about four weeks behind.*

*When I submit a voucher, I can receive cash immediately and the voucher is processed at a later time. Why can't a check be cut within a week and the voucher processed as conveniently? Why does the check have to await voucher processing, but cash is available immediately?*

*Why not allow the employee to submit the voucher and then submit a check when billed, since that is how Sandia treats the employee?*

**A:** We agree that the period of time it currently takes to get a reimbursement to an employee is often too lengthy. Our current semi-automated reimbursement system requires a minimum of approximately two weeks from receipt of a voucher to delivery of a reimbursement to the employee (including mail time). Other factors frequently lengthen the reimbursement cycle, such as the voucher having to be returned to the employee for clarification or a business justification of an expense. The staffing level in Payment Processing Dept. 10504 has been too low to avoid accumulation of a backlog of vouchers awaiting processing, using the current system and procedures. The usual backlog is approximately five business days. During summer vacation times, the backlog can be longer, even with more than the usual overtime being worked.

We have recently increased staffing levels in this area slightly by reducing staff levels in other areas of Dept. 10504. Also, a new fully automated Sandia Reimbursement and Vouchering System (SRVS) will be implemented before the end of 1993, which will facilitate further improvements in the payment and reimbursement cycle. We expect to see the reimbursement cycle required by system processing to be cut to one day. After these changes, we expect a common cycle to be about one week, with many reimbursements generated in two business days (not counting mail delivery time).

We have also been exploring the possibility of making reimbursements to employees through the new SRVS system upon receipt of the voucher in Dept. 10504. In this scheme, we would reimburse you before processing and auditing the voucher, similar to the way the IRS handles tax returns requiring refunds. Adjustments required as a result of voucher processing and auditing would have to be settled by the employee.

Rob Banwart (10504)

*Q: North-south pedestrians and bicyclists at the corner of F and Seventh streets (southeast corner of parade ground) need curbside buttons to activate the traffic light. If there are no cars to trigger the loop detectors, the wait for the light to turn green is excruciatingly long. This apparently tempts more and more hikers and bikers to cross against the light, which appears to be a definite safety hazard.*

*Is this a problem that Sandia can address independently, or do we have to persuade the Air Force to make this modification? I will appreciate your attention to this.*

**A:** The traffic issues at the intersection of F and Seventh streets have been addressed by the Sandia Traffic Committee. A plan is under way to install pedestrian- and bicyclist-operated buttons to activate the traffic light.

The project has been designed by Sandia and will be installed by the Air Force, as this is their property. Sandia will fund the construction. However, the project is on hold awaiting funding and the transfer of funds to the Air Force.

I do not have an answer as to when funding will be transferred, but we will get it accomplished as soon as possible.

Ed Graham (7800)





**Lots of Leftovers from World War II****Sandia and the Army Team Up to Destroy Hazardous Waste**

Wastes that can't safely be destroyed by fire will yield to water — that's the premise of a disposal method called supercritical water oxidation, or SCWO for short.

Having successfully conducted a feasibility study and small-scale engineering design trial, Sandia researchers and engineers are moving ahead toward production of an operational SCWO reactor.

Funded by the US Army Armament Research, Development, and Engineering Center (ARDEC), the innovative SCWO system will help safely destroy hazardous military waste stored at McAlester Army Ammunition Plant in McAlester, Okla. No acceptable method currently exists to

**The method can handle solvents, oils, herbicides, medical wastes, pharmaceutical byproducts, and sewage.**

eliminate aging surplus stockpiles of these suspected carcinogens, which the federal government banned from incineration in 1980.

During the next several weeks, Sandia plans to announce the selection of an industrial partner responsible for building a scaled-up pilot plant at McAlester.

"Supercritical water oxidation is a promising technology for solving specific national waste-disposal problems related to hazardous organic waste streams," says Ken Tschritter of Technology Applications Dept. 8113.

**Countering Environmental Threats**

"This new system will benefit the entire nation by helping government agencies and commercial enterprises clean up a wide range of materials that threaten the environment," says Ken, "including solvents from electronics manufacturing, oils, herbicides, medical wastes that can be put in an aqueous solution, pharmaceutical byproducts, and sewage."

According to Ken, who served as project manager during FY93, the key to the system is that water heated above its critical point acts as a solvent for organic materials. As a result, organic compounds dissolve quickly and are easily destroyed in supercritical water.

During the process, a waste stream is mixed with water and an oxidizer, such as pure oxygen or air, inside the reactor. The solution is heated to approximately 450-600 degrees C and 4,000 psi, depending on the optimal operating conditions for a particular compound. The oxidizer and organic materials react within seconds to produce water, carbon dioxide, and simple salts that can be easily separated.

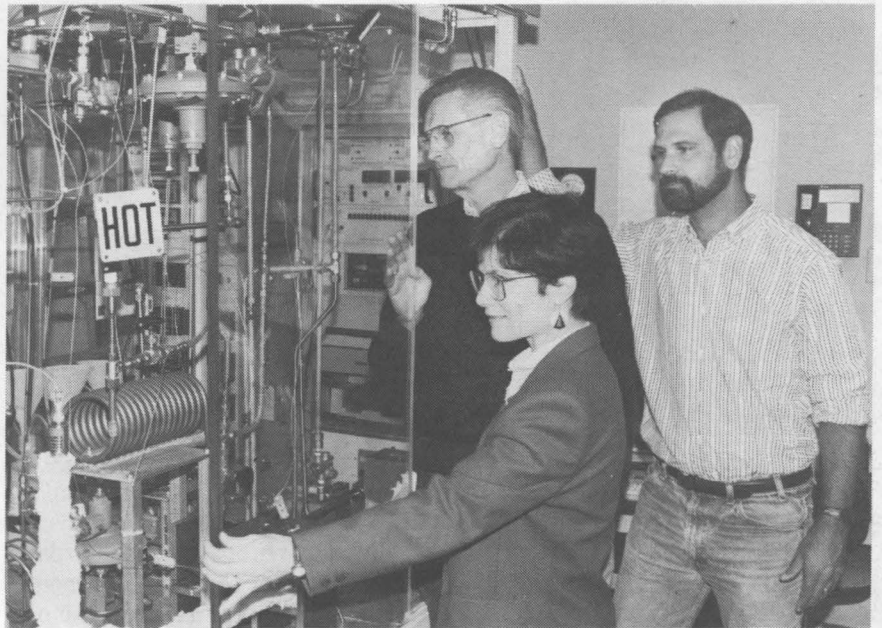
"The new technology offers significant advantages over incineration, which emits pollutant gases

such as nitrogen oxides and sulfur dioxide," Ken explains. "For example, even if the military could legally burn surplus dyes, sulfur dioxide would be released into the air. In contrast, the self-contained SCWO system produces sulfate ions that remain in the water. After the reactor is cooled, a single-step process allows operators to capture and analyze the sulfate along with all other discharges before disposal."

**Practical Research**

"The SCWO project is a success story of a practical application that developed from research efforts," says Steven Rice of Combustion Research Dept. 8361, a principal investigator during the feasibility study. After identifying ARDEC's specific waste treatment needs, the Sandia team first determined if SCWO would work effectively on the obsolete munitions, then designed a system that could solve the problem. Research scientists and engineers from Centers 8100, 8300, 8400, and 8700 are major contributors to the Sandia/California effort.

"Many of the stockpiled munitions date back to World War II, when the military used spotting dyes contained in six-inch projectiles to stain ocean water for gun calibration," Steven notes. "Various types of smoke munitions have also been longtime



SCALING UP — Part of the Sandia team working on supercritical water oxidation (SCWO) views a lab-scale SCWO reactor used to demonstrate principles that will soon be put to work in a pilot plant. From left: Ken Tschritter (8113), Mary Clare Stoddard (8412), and Steven Rice (8361).

plant comes on line, however, Sandia and its industrial partner must implement a solution to problems caused by production of solid salts, which can plug the reactor.

"Once the design is final, we expect that supercritical water oxidation plants will cost less to operate than incineration facilities," Steven says. Although initial capital costs of building SCWO reactors will be high because of the expensive materials required for the high-pressure plumbing, Steven says the systems may actually run as self-sufficient plants by recovering energy produced during the oxidation reaction.

**Commercial Applications Planned**

Mary Clare Stoddard (8412), project manager for FY94, emphasizes that potential commercial applications for SCWO should make the technology attractive to private industry.

"Once we build and refine an operational reactor, placing this technology in the commercial sector may help solve many current problems related to the disposal of hazardous waste," she points out. "In addition, Sandia is currently building a separately funded engineering evaluation reactor designed to evaluate destruction of explosive materials and develop engineering solutions to operational issues."

Moreover, Mary Clare says, DOE is funding SCWO projects to study the clean-up of mixed wastes that combine radioactive and chemical components. Once the chemical elements are removed, the remaining radioactive material can be more easily treated. The results of these studies could help solve waste treatment problems at several facilities, including the Hanford, Savannah River, and Idaho National Engineering Lab sites. ●

**SANDIA CALIFORNIA NEWS**

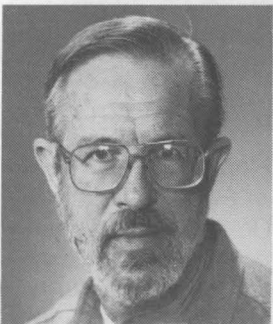
military items. By dismantling the shells and mixing the powders with water, the military services can make the hazardous waste available in a proper dilution for the SCWO process."

To date, Steven, along with Tony LaJeunesse of Engineering for Transportation and Environment Dept. 8412, has successfully destroyed small amounts of the dye and smoke materials in a test model reactor built at 1/50 scale. The scaled-up pilot plant, scheduled to begin operating at McAlester in August 1996, will most likely be fabricated from a sophisticated nickel-based alloy to ensure corrosion resistance. Steven points out that the construction material must survive severe temperatures and pressures to maximize reactor life and minimize the amount of reactor metals discharged in the effluent.

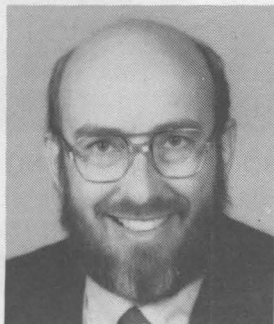
Before the 100-gallon-per-hour demonstration

**Congratulations**

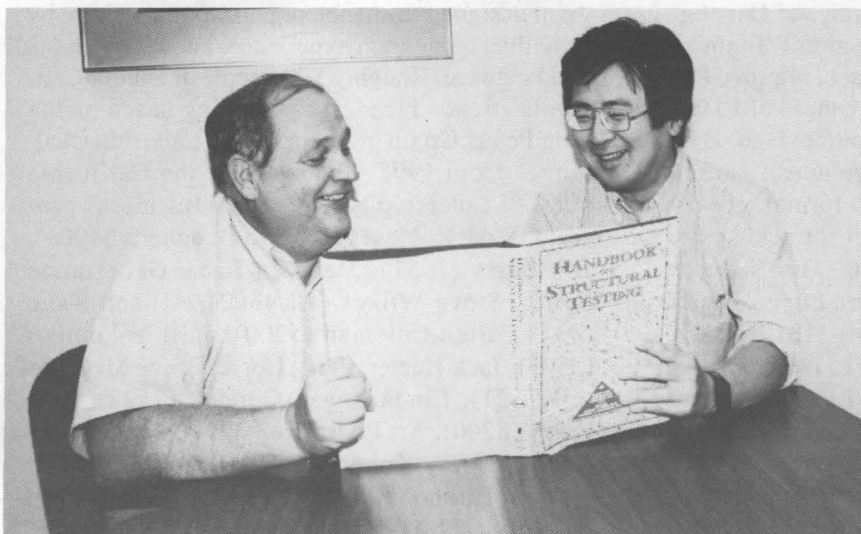
To Nina (8113) and Phillip French, a daughter, Sophia Elizabeth, Nov. 6.

**Recent Retirees**

Hal Short  
8525



Wil Jorgenson  
8414 25



SANDIA CO-EDITORS Bob Reese (7001, left) and Wendell Kawahara (8746) peruse their new *Handbook on Structural Testing*, published this summer. Some 35 contributors, including 10 Sandians, were assembled to produce this 400-page sourcebook that organizes and reviews fundamental types of structural tests, methods, and procedures.





SANDIA/CALIFORNIA'S Explosives Safety Assurance Process Team received one of the five Silver Awards in the first Sandia President's Quality Awards presentation ceremony Nov. 19. John Rosenow (8643, left), Jane Ann Lamph (8283), and Dale Walker (5366) — standing in front of a small explosive storage magazine, or "magazette" — were cited with 14 other team members for their efforts that resulted in the California site experiencing its first-ever explosives safety audit with no major findings.

*(Continued from Page One)*

## Quality Awards

but expanded the definition to include all production/manufacturing customers within the Labs. Through fact-gathering and teaming, created a new accelerated process for installing equipment that has proved to be 300-400 percent faster than the previous process. Jeff Danneels, Rose Cordova, Rose Costilla, Rick Ramirez, John Norwalk, Jerry Savage, Paul Schlavin, Ed Coghlan (all 7908), Dave Hendrick (7913), Paul Matthew, and Shelly Freedman (both contractors).

- Total Life Concept (TLC) Program Team — Contributes to the competitive advantage of Sandia by providing all employees with opportunities to achieve and maintain optimal health and well-being. The TLC Program is a proactive approach to reducing medical care costs attributed to illnesses or injuries related to unhealthy lifestyles. Anna Marie Miller, Linda Duffy, Michaeli Portman (all 7035), Jessie Black, and Colleen Bohne (both contractors).

- Sandia/California Explosives Safety Assurance Process Team — Employed quality tools and methods that resulted in the California site experiencing its first-ever explosives safety audit with no major findings. The same processes produced a new understanding of customer requirements, which allowed the site to move from a reactive approach of addressing findings to a proactive approach of identifying and correcting items of noncompliance. John Tootle (5363), Dale Walker (5366), Bruce Worden (5373), John Didlake (5375), Joan Bersie (8101), Jack Swearingen, Ken Tschritter (both 8113), Rex Steele (8281), Jane Ann Lamph (8283), Larry Borello (8445), Dwayne Mohrman (8604), David Abrahams (8609), Bill Rego, John Rosenow (both 8643), Tim Sheppodd (8711), Bernie Bernal (8715), and Ernest Fawcett (contractor).

- Laboratory Directed Research and Development (LDRD) Process Management Team — Based on DOE and internal feedback, improved the quality, efficiency, and responsiveness of LDRD processes, including negotiated/revised DOE guidelines, technical staff training, human subjects eligibility, standardized proposal format, generic technical criteria, a new project cost tracking system, and Ombuds participation. Tim Knewitz (182), Peter Mattern (1010), Laura Lopez, Chuck Meyers (both 1011), Del Owyong (1312), David Womble (1422), Ernie Brickell (1423), Steve Rottler, John Zepper (both 1511), Linda Benavides (1600), Ron Diegle (2502), James Gerardo (5601), Suzanne Weissman (6000), Marion Scott (6114), David C. Williams (6429), Louis Cropp (6474), Robert Luna (6643), Rick Stulen (8342), Duane

Lindner (8701), Phil Montoya (9912), Maurice Katz (DOE/DP), Larry Adcock (DOE/AL), and Jim Lester (DOE/KAO).

- Hermes III Operations — Quality plan developed and implemented for the Hermes III radiation effects simulation cost center operation. Includes a team that reviews weekly performance reports and action, customer surveys, and visits. Expectations met and satisfaction improved by response to comments, resulting in new test capabilities and services. Victor Harper-Slaboszewicz (6343), Peter Micono (9322), Kenneth Mikkelson, Richard Westfall (both 9342), Stephen Neely, and Richard O'Rourke (both contractors).

## Turquoise Awards

Following are brief descriptions of the Turquoise Award-winning projects and the names of team members, with organizations (or other affiliations) in parentheses. Organizations are as of the date of the award nomination.

- Tritium Research Laboratory Transition Project — Customer-focused activity providing each major customer and supplier with a department point of contact who is empowered to obtain requirements and meet or exceed them. Customer satisfaction is provided through frequent face-to-face meetings, documented requirements, closure of actions taken, and follow-up interviews. Diane Diemer, Harold Norris (both 5361), Keith Kuhlengel (8115), Adana Dean (8200), Donald Adolphson, Gerald Giovacchini, Michael Hansen, Joel Kuhlmann, Marion Martin, Val Pestanas, James Smith, Rex Steele, La Neen Stewart, Cornelius Visbeck, William Wall, Roger Watson, John Wheeler (all 8281), Toff Garcia (8641), Daniel Folk (8712), Wylie Fabyan, Charles Laguer, August Martin, Thomas Gorman, Todd Howe, Henry Irwin, Jerry Parker, and Michael Serpa (all contractors).

- Environmentally Conscious Soldering Initiative — Joint Motorola-Sandia evaluation of a no-clean soldering technology that allows Motorola and others to eliminate the use of ozone-depleting chemicals. The program has resulted in Motorola being granted variances to use the no-clean technology on military contracts, more than 270 organizations contacting Sandia for details on no-clean soldering, and Sandia organizing a 20-member task force to evaluate the technology for widespread applications. Dennis Huffman (2314), Maria Amendariz, Robert Cranwell, Ron Iman (all 6613), Mark Paffett (Los Alamos National Laboratory), Dennis Anderson, Larry Lichtenberg, and Phil Van Buren (all contractors).

- Leadership Training at Sandia/California — Sandia's first common learning experience, a program designed to change organizational culture by providing a common experience, knowledge base, and language. Roughly 800 people at Sandia/California attended leadership training based on the Tom Peters Group program "The Leadership Challenge" from 1992-93, as part of the California site's "Leadership is Everyone's Business" program. Mike Robles (600), Bob Dougherty (1906), Jim Berry (1951), Maureen Baca, Georgianne Smith, Steve Wilkes (all 4302), Allison Kane (4311), Beth Coleman (5200), Cliff Yokomizo (5301), Jack Hueter, Perry Horse, Bruce McClure (all 7521), Linda Logan-Condon (7522), Ron Detry (8200), Art Pontau (8347), Peg Bondurant (8400), Corey Knapp (8401), Karen Cardwell, Howard Hirano (both 8441), Anton West (8446), Pat Smith (8522), Matt Connors (8523), Denise

Koker, Tracey Lamee, Marta Leon, Ricky Tam (all 8526), Jim Pergrossi (8613), Martha Campiotti (8701), and Sabina Spencer (contractor).

- Development of Robust, Wide-range Hydrogen Sensor Technology — Focused on NASA's requirements for a small, fast, rugged hydrogen sensor that would work in vacuum and non-oxygen environments, allowing Sandia to advance research concepts through development and application. Technology, integrated circuit design, and other work processes were monitored against project schedules using Gantt charts. Feedback from the customer was disseminated at biweekly meetings and through meeting minutes and action items. Mason Blaich (1301), Bob Hughes (1315), Glenn Bailey (1323), Harold Stewart (1324), Paul McWhorter, Steve Montague, Jose Rodriguez, Belinda Tafoya (all 1325), Wayne Corbett, Mike Knoll (both 1341), Steve Babicz (2272), and Phil Dreike (2273).

- Satellite Payload Modification — Responding to January 1992 request from the Air Force, the team proposed a modification that we could make to Sandia's Global Positioning System (GPS) payload to eliminate an anomaly in another GPS subsystem. All 17 payloads have since been modified, and 12 are already on orbit. Paul Phipps (9206), Steven Yearout (9212), Irene Dugger, Barbara Merriken (both 9213), Randy Jannusch (9216), Darlene Maldonado, and Arlie Robinson (both contractors).

- Intel Tank Failure Team — A "Response Team" process was used to form a multi-organizational, multidisciplinary team to determine rapidly the cause of a pressurized sulfuric acid tank explosion at Intel's Rio Rancho, N.M., plant. The process provided a flexible method for learning the extent of the problem, defining requirements, assigning leaders, and recruiting staff with the required skills. Karl Schuler, Adam Slavin (both 1562), Gordon Pike (1802), Martin Carr, Richard Grant, Frederick Greulich, Paul Hlava, Alice Kilgo, Gonnie McKenzie, Joseph Michael (all 1822), Willard Hareland (1824), Robert Sorenson (1832), Edwin Beauchamp, Jill Glass, Sandra Monroe (all 1845), Mark Davis (1880), Tommy Guess, Mark Stavig (both 2472), Roger Moore (2476), and John Gieske (2752).

- Sandia/California Assessment of Compliance — Facing DOE Technical Safety Appraisal, used

*(Continued on Next Page)*



PROGRAMS OFFERING tip-top health and well-being for Sandians took a Silver Award for the Total Life Concept Program Team in the Sandia President's Quality Awards presentation Nov. 19. Team members are, standing, from left, Linda Duffy (7035), Colleen Bohne, and Jessie Black (both contractors); and seated, from left, Anna Marie Miller and Michaeli Portman (both 7035).



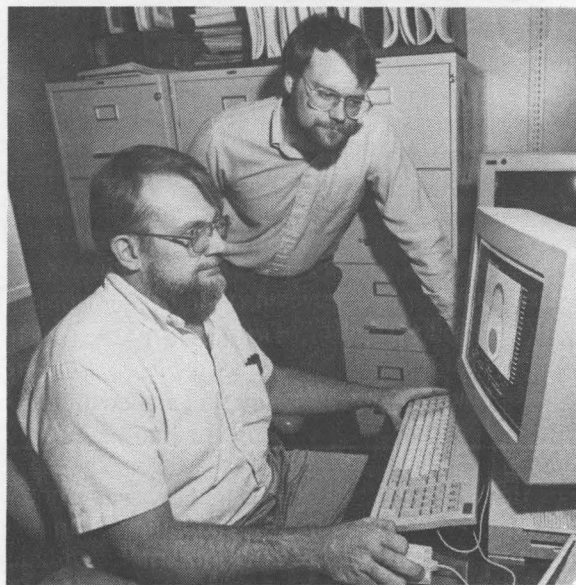
*(Continued from Page One)*

## Comet Smash

That's because their computer codes can handle the deformation of the comet fragments as they smash into Jupiter's atmosphere, says Tim Trucano. "Coming in at 60 kilometers per second," he says, "the fragments will undergo a large amount of deformation even in thin atmosphere. A standard aerodynamic code, which assumes something like a rigid airfoil, can't model that kind of event. But codes developed at Sandia let us model how the material of the comet responds to the high pressures of this impact."

### Not like Dinosaur-Demolisher

Although the coming event has been compared to an asteroid collision on Earth 65 million years ago, the Sandia researchers say Jupiter's collision with a comet will be vastly different from the prehistoric event that some scientists believe led to extinction of dinosaurs. That collision left a crater at least 180 kilometers in diameter, centered



COMPUTER SIMULATION of comet colliding with Jupiter's atmosphere is viewed by Tim Trucano (1431, seated) and David Crawford (1433). They're looking at a comet fragment a tenth of a second after it enters the atmosphere.

on what is now the coast of Mexico's Yucatan Peninsula.

Mark says the main difference lies in the surfaces of the two planets. Earth's atmosphere had relatively little effect; when the asteroid crashed to the ground, the pressure increased instantaneously and resulted in an explosion a million times as great as the largest nuclear weapon test.

Jupiter doesn't have a sudden solid surface like Earth's. Its hydrogen-helium atmosphere increases in pressure gradually over a few hundred kilometers, from the near-vacuum of space to the equivalent of hundreds of earth atmospheres.

The pieces of the comet — possibly as many as 21 — should take about six days to crash into Jupiter. The collisions will be on Jupiter's far side, but the aftereffects are expected to be visible to earthbound astronomers as the planet rotates. Other manifestations of the collision may be flashes of light reflected off Jupiter's moons and photographic imagery from the approaching Galileo spacecraft, which will have a better viewing angle.

### Three Hours for Three Seconds

The supercomputer simulations, performed by Tim Trucano, have focused on one of the largest pieces, 3 kilometers in diameter. To calculate the first few seconds of the comet's entry into Jupiter's atmosphere takes about three hours on a Cray YMP supercomputer, or about 12 hours on a computer workstation.

The first calculations went through three seconds, at which point the fragment was beginning to

**"This is far beyond what we can simulate in a laboratory. It's a chance to further validate our computer codes."**

break up. "I've extended one of the earlier calculations out to five seconds," says Tim. "The fragment is definitely gone by then. Now we're running calculations with a more realistic representation of the density profile of Jupiter's atmosphere. The next step after that is to use a finer computational mesh to represent the comet."

In the calculations, Tim explains, the collision

### Breaking Up — It's Always Painful

Here's the scenario for a comet's collision with Jupiter, as suggested by Sandia's supercomputer simulations:

When the comet enters Jupiter's atmosphere, the pressure increase will be gradual. The atmosphere is thin at the top, so for the first few seconds the comet body will slice through almost unhindered. After that, pressure will build rapidly and deform the comet until it begins to break up.

When the comet starts to disintegrate, it will have lost less than 2 percent of its kinetic energy. This means that as much as 98 percent of the energy of the largest pieces of the original comet will be carried beneath Jupiter's clouds. There, the energy will be explosively released.

The mechanisms behind the final explosion of energy are still being worked out by a Sandia research group. But results to date will give atmospheric scientists a starting point from which to determine whether the collisions will make giant mushroom clouds, create a new red spot on the planet, or be swallowed without a trace.

isn't represented as comet fragments moving. Rather, the comet is fixed in space and Jupiter's atmosphere rams into it. This technique gives more accurate results than modeling the motion of the comet through a fixed atmosphere.

So far, the simulations picture a comet fragment as a spherical ball of ice. But they're more likely to have an irregular shape, says Tim. The Sandia group plans at some point to model odd-shaped fragments impacting Jupiter's atmosphere at an oblique angle.

That will considerably complicate the calculation, so some of the more-complex simulations will probably be run on the Labs' new Paragon XP/S supercomputer. Using the Paragon, a team of Sandia and University of New Mexico researchers recently achieved a record computation speed — which could be just what's needed for predicting an out-of-this-world collision.

●CS/AEtheridge(12630)

*(Continued from Preceding Page)*

## Quality Awards

Total Quality Management methods to evaluate compliance with DOE requirements. Allowed California site to evaluate compliance with hundreds of individual DOE requirements, and identify areas of non-compliance and areas requiring additional resources. Cliff Yokomizo (5301), Dick Rhode (7254), Ken Tschritter (8113), Norm Wagner (8116), Sheila Akins (8275), Bill Wall (8281), Jane Ann Lamph (8283), Pat Gildea (8442), Arlene Franke (8522), Jim Keeton (8531), Robert Petro, Don Wagner (both 8532), Debra Nissen (8601), Grace Delgado, Kelly Donnell, D.W. Putz (all 8609), Bob May (8612), Albert Lau, Jenifer Leon, Don Patrician (all 8641), Don Nissen (8642), Carol Caldwell, Fred Hart, Jim Hopwood (all 8643), Theo Pope (8701), and Jan Jackson (contractor).

• Development, Delivery, and Evaluation of Program Development Course — Designed, developed, implemented, and evaluated the Program Development course (PD100) for application of a systematic instructional design process to analyze customer requirements. A follow-up evaluation confirmed the course had an impact on Sandia through improved employee performance and demonstrated return on Sandia's training investment. Flo Chavez, Charline Seyfer, Christina Tolendino (all 7522), Joe Polito (9911), Terry Bacon, David Pugh, and Celia Merrill (all contractors).

• 1800's Support of WIPP Gas Generation Program — Continued support of Sandia's WIPP Gas

Generation Program with technical expertise, experimental data, and analytical methods development. Effective communication and periodic reviews facilitate the WIPP project support, even though priorities and goals change frequently. Susan Bender, Stephen Reber, Steven Thornberg (all 1823), and Pamela Puissant (1824).

• Process for Nationwide Two-way Teleconferencing through Secretary O'Leary's Vision for the Department — Process of researching, scripting, approving, and broadcasting a nationwide two-way teleconferencing video on quality principles to DOE stakeholders articulated Secretary Hazel O'Leary's vision for the department, and helped move it along the road to quality. Mark Schaefer (1955), Bruce Hawkinson (4304), Gloria Zamora (4505), Alex Ryburn, Pace VanDevender (4700), Bob Gardner, Judy Hubbard, Gary Kishi, Al Lujan, Bob McInteer, Richard Sanderville, Ed Sisneros, Regina Valenzuela (all 7153), Don Morrow (7522), Barry Schrader (8522), Carol Drury, Paula Hill, Guy Schein (all DOE Headquarters), Susan Head, Dan O'Shea (both DOE/AL), Larry Quinn, David Vennell (both Department of Agriculture), Charlene Luetjens, and Chuck Woolsey (both contractors).

• The Specialty Metals Processing Consortium Project — Establishment of an effective process for communication with customers, contributing to the success of the Specialty Metals Processing Consortium. The mechanism includes semiannual review meetings, individual programmatic working group meetings, and defined communication lines between project leaders and customers. Process also includes a broad range of informal interactions, which facilitate two-way information flow,

including industrial interns, seminars, and experiments. Stephen Rottler, Phillip Sackinger, Randall Schunk (all 1511), Brian Damkroger, James Van DenAvyle, Robert Fisher, James Jellison, Jeannette Lloyd, Michael Maguire, James Maroone, Mark Miskiel, Gregory Shelmidine, Rodney Williamson, Frank Zanner (all 1833), Lee Bertram (1843), Suzanne Stanton (2338), John Brooks, John Krafcik (both 8712), David Evans, John Leland, Robert Mann, Danny McCallum, and David Melgaard (all contractors). ●

## Welcome

*Albuquerque* — Yvonne Bledsoe (12111), Vicky Claunch (12111), Evangeline Clemena (12111), Nona Danfield (12111), Linda Daniels (12111), Gloria Fernandez (12111), Joanne Hertz (12111), Patricia Kyle (12111), Carole Lojek (7585), Marie Maestas (12111), Marisela Marquez (12111), Anne Plunkett (12111), Joyce Power (12111), Sylvia Saltzstein (7711), Joyce Sartain (12111), Mary Warner (12111). *Other New Mexico* — Catherine Baca (12111), Stephen Dwyer (6621), Mary Ellen Lucero (12111).

Elsewhere: *Nevada* — Michael Schalip (7401).

## Congratulations

To Berlinda (2172) and Kenneth (2643) Eras, a son, Andres, Oct. 24.

To Victoria and Gary (6514) Harms, a son, Christopher James, Oct. 26.



(Continued from Page One)

## Supercomputing '93

said Nick as he checked his screens to make sure everything was working. "Ultimately it will be offered commercially, but it isn't available now." All this is a forerunner to the still-faster gigabit (billions of bits per second) rates envisioned for forthcoming information superhighways.

### Video, Voice, and Engineering Simulation

While high-resolution two-way video and voice connected Nick's workstation at the Portland conference with a workstation in Bldg. 880 in Albuquerque, he also called up recorded video footage of a Sandia rocket launch and ran a parallel

**"The technology is so new that a lot of bugs were unrecognized until we started looking into it."**

supercomputer simulation of a complicated engineering analysis problem. All this was being carried out and transmitted at the same time between Albuquerque and Portland, appearing on different parts of his workstation screen.

"This is the first time anyone has combined these kinds of technologies over these distances and supplied these kinds of services," said Nick.

The demonstration was made possible by the collaborative efforts of Sandia, its communications partners from AT&T and US West, and its ATM switch partners.

To Nick's right was a bank of three ATM switches made by three different companies, FORE Systems, Newbridge, and SynOptics, and behind them was another switch provided by AT&T.

This eclectic assemblage of ATM switches representing many vendors formed an innovative demonstration of interoperability, according to Frank Bielecki (1951), coordinator of Sandia's exhibit at Supercomputing '93. "We're trying some things that haven't been tried before," he said. "We're interfacing three competitors' switches. Interoperability has been a big question. The technology is so new that a lot of bugs were unrecognized until we started looking into it."

Those bugs showed up throughout Supercomputing '93, but, says Nick, "In general, I'd give it a big thumbs-up. We've demonstrated voice, imaging, video, and data services using ATM and SONET technologies over the long haul. This is really a one-of-a-kind thing."

The demonstration was just one of the 14 Sandia applications exhibited at the big annual super-

computing conference, attended by more than 5,000 persons. Sandians seemed to be everywhere. Dona Crawford, Director of Scientific Computing Center 1900, was the conference program chair and is a member of the conference steering committee. Dick Allen (1422) was the education chair, busy getting high school kids involved in supercomputing and teaching teachers the technology. Jeff Jortner (1408) was in charge of audiovisual arrangements. Ray Cline (1952) was a member of the program committee. An additional 30-some Sandians made technical presentations, taught workshops, hosted poster sessions, or participated in long-distance computer-linked demonstrations.

At the large Sandia exhibit, an overhead sign marked the theme: "From Research to Results." Networking and multiconnectivity were ubiquitous subthemes. One experiment, between the exhibit and Intel's supercomputer facilities in nearby Beaverton, Ore., demonstrated high-performance parallel interface (HIPPI) technology over SONET transmission facilities at a data rate of 622 megabits per second. This was a Sandia and Los Alamos collaboration with Intel, US West, GTE, and AT&T.

### Visualizing Heat Transfer

On the opposite side of the exhibit, John Shadid (1421) was showing his work with Bill Bohnhoff (1425) in computational manufacturing. Up on the large screen came a rotating visualization of a parallel heat-transfer analysis of computer chips on a printed wiring board. Such analyses can help manufacturers avoid heat-buildup problems. Then the screen showed a dramatic visualization taking a viewer inside a representation of a heart. This study by John, Scott Hutchinson (contractor), Harry Moffat (1126), and Kwon Ng of New Mexico State University is using Sandia's parallel supercomputers to optimize electrode placement for cardiac defibrillation.

Other Sandia demonstrations dealt with everything from parallel interactive molecular dynamics for studying a chelate molecule (Depts.



UNDER THE BANNER marking the Labs' exhibit at Supercomputing '93, Bruce Whittet (1954) works on a Sandia demonstration as unidentified visitors look at the display. (Photo by Bud Pelletier, 8275)

8117 and 8353) and parallel seismic ray tracing for 3-D geophysical modeling (8117) to Sandia's FASTCAST (computational technologies for speeding investment casting, 1833, 1511) and TIE-In (Technology Information Environment for Industry, 1404, 1434). Organizations involved in still other demonstrations included 1425, 1954, 1955, and 1511.

"High-performance computing and communications is a core competency for Sandia," says Dona. "Supercomputing '93 was an excellent opportunity for us to demonstrate how critical and how cross-cutting this technology is."

•KFrazier(12630)

## Savings Plans End-of-Year Deadlines Near

Fidelity Institutional Retirement Services Company, which handles investments for the Sandia Savings Plans, has established deadlines to allow for its processing and reporting requirements, while ensuring receipt of withdrawals by participants during the 1993 calendar year. The deadlines also apply to withdrawals and loans by phone.

All requests for withdrawals involving checks, mutual funds, or stock received by Fidelity by Thursday, Dec. 16, will be processed with a 1993 check date and delivered within the normal time of 5-7 working days. Any requests received after Dec. 16 will be held for processing until Jan. 3 and will be taxable in 1994.

Dec. 28 is the last date for processing loans. No processing will occur after this date until Jan. 3. Any requests received after Dec. 28 will be held for processing until Jan. 3.

Questions about these deadlines should be addressed to Fidelity by phoning 1-800-354-3965, or Rebecca Spires of Pension Fund and Benefit Program Management Dept. 3542 on (505) 844-9965. •

## Info Testbed — and Labs' Role — Featured in Supercomputing Demos

While Sandians showed off a variety of other accomplishments at Supercomputing '93, Spencer Nelson (1955) was busy calling up Landsat images from the University of New Hampshire Institute for the Study of Earth, Oceans, and Space. He was showing Sandia's contributions to the National Information Infrastructure Testbed (NIIT, pronounced "neat") and its first application, the Earth Data System (EDS). EDS was demonstrated throughout the conference and also at a NIIT press event in Washington, Nov. 18.

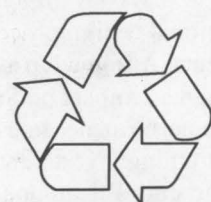
Sandia used its new high-capacity, 45 megabit/second 1,100-mile computer link between the California and New Mexico sites as part of the network for EDS. Sandia also managed the nationwide EDS high-speed computer network linking nine EDS sites (including the two Sandia locations) throughout the nation. It set up a prototype network manage-

ment center at Sandia/California to do so.

"We at Sandia have been working on our own version of the NIIT," says Dona Crawford (1900), who in addition to her Sandia duties also heads NIIT's management committee and is on the NIIT board of directors. "In our link between California and New Mexico, we're building an infrastructure that ties together the resources necessary to solve problems.

"We link people to people, people to machines, and machines to machines in such a way that we are inventing the future."

Next to Spencer on the exhibit floor, Christine Yang (1952) was demonstrating the next NIIT application, the gas and oil national information infrastructure testbed. This program will apply the DOE national labs' computational research and advanced information technologies to help the oil and gas industry speed up the processing and analysis of its exploratory data



This newspaper can be recycled with Sandia office paper



## Helping Young People Help Themselves

# Evans Craig Helps Bring Technology, Ambition to Young Minds

It's that smile of realization, that glint of recognition in a young person's eyes, that contract employee Evans Craig craves.

For four years Evans, a part-time systems analyst in Product Records Dept. 2881 and full-time student at the University of New Mexico, has devoted much of his personal time to teaching computing and science to Native American students.

His resolve to work with young people was stiffened during a DOE summer workshop three years ago at Lawrence Livermore National Laboratory (LLNL) — now dubbed Countdown to Supercomputing — for high school teachers and students. As part of the workshop, Evans was asked to escort a group of 40 Native American high school students to LLNL for three days of lectures followed by two days of hands-on work with a Cray supercomputer.

When the group arrived, however, Evans found that the lectures were geared primarily for teachers, not students. "After the first day of trying to keep them awake I said 'No way, we're not sitting through this another day.'"

### Students Teaching Teachers

That night, he stole into the computer lab. Boxes of computers were everywhere. Evans spent all night setting up a single workstation and making sure it was networked correctly to the Cray.

"Tuesday morning, I told the students to set up all the computers 'just like that one,'" he says. "Then I went through the course materials and threw out all the irrelevant stuff." Evans began to teach the students himself.

By Thursday morning, the teachers had finished their lectures and joined the students in the computer lab. "It was incredible — the students were teaching the teachers how to use the supercomputer," he says.

Mike Niblack, LLNL's American Indian program manager at the time, says, "From the first day, Evans' attitude was 'Don't tell me what we can't do, tell me what we can do.' Where other people would have been swamped by problems, he saw only potential."

"He used the challenges to teach the kids," adds Mike. "That was the miracle of what he did."

After the workshop, Evans spent several months writing a new tutorial geared for students. The next summer, he walked into the computer lab, disks in hand, ready to access the Cray.

Now, two years later, Countdown to Supercomputing has been expanded and officially funded by DOE, thanks in large part to Evans, who is proud of the program's growth. "I was asked to get the students ready to use the supercomputer, and I took it seriously," he says.

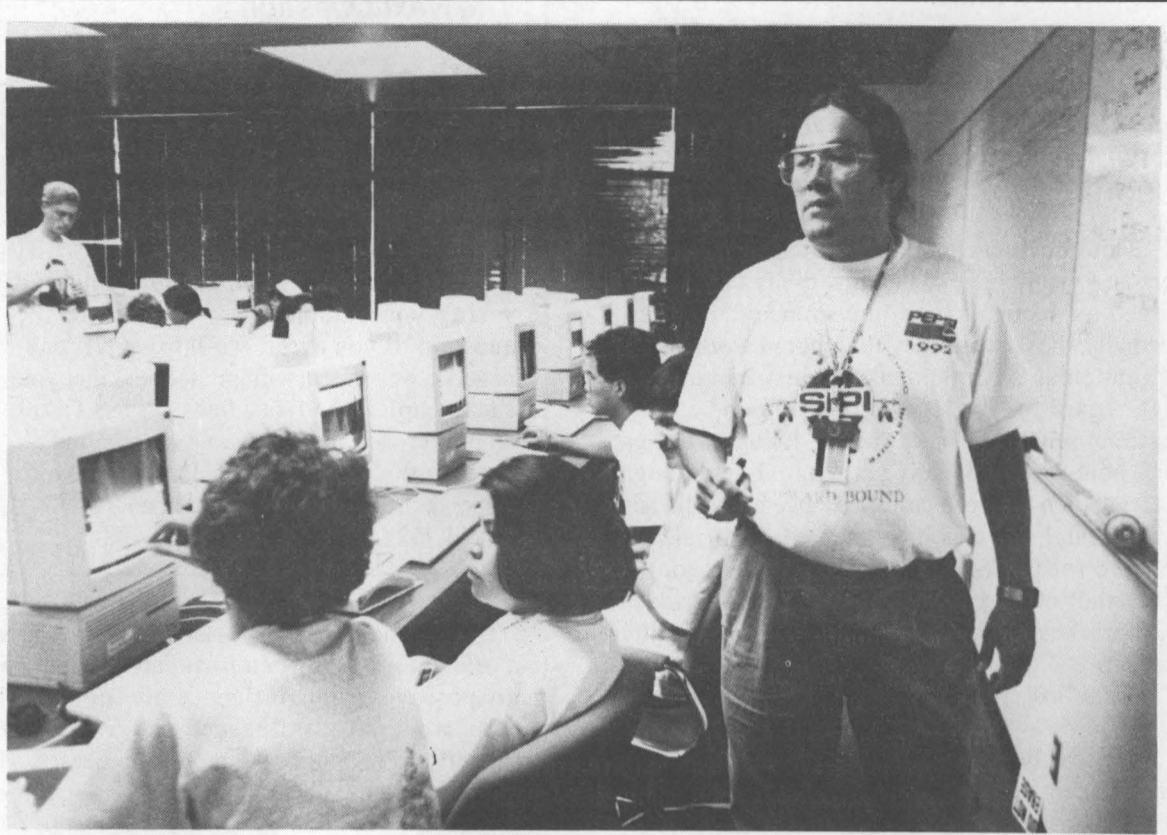
The expanded program — specifically for college-bound Native American high school students — includes four successive courses that cover the gamut of supercomputing know-how, including telecommunications, fractals, data manipulation, design and animation, and work on a supercomputer studying such environmental issues as the hantavirus and desert food chains.

"Now that they've used some of the most powerful computers in the world, they tell me they want to go to MIT or Stanford," says Evans. "The most important thing is now they have ambitions."

The program was recently awarded one of six LLNL diversity awards by LLNL Director John Nuckolls.

### Info and Economics

A Navajo originally from Shiprock, N.M., Evans says working with young Native Americans is a chance to help his own people help themselves. "Exposure is what it's all about," he says. "The younger you expose them, the higher their



**CODDLED "COUNTDOWN"** — For three years, contract employee Evans Craig (2881) has nurtured the Countdown to Supercomputing program, helping it grow from a teacher-oriented lecture session to a full-blown summer workshop for college-bound Native American students. His work has made him a leader in Native American education. Here, he helps 1992 Countdown students study environmental issues, such as desert food chains and plague, using supercomputer workstations.

ambitions."

His primary goal, he says, is to foster economic development for Native Americans by providing better access to technology and the information it carries.

Countdown isn't the only major educational program Evans is involved with. He's also trying to link Native Americans to national information highways such as the Internet and helping young people learn to take college entrance exams. He is a member of Sandia's American Indian Outreach Committee. (See "Merging onto the Info Highways, and More.")

His work with young people has earned Evans a high seat in the Native American educational community. He has been flown to Washington by

the National Science Foundation and the National Academy of Sciences; to Spokane, Portland, and Denver by the American Indian Science and Engineering Society; and to San Francisco and Rhode Island to speak at various conferences and workshops.

At Sandia, Evans does document control and quality assessments for people in Dept. 2881. "Working at Sandia, you get a lot of tools to help the community," he continues. "I thank the people in Educational Outreach Dept. 3020 for being so helpful and supportive."

Evans is now working on his BBA in business computer systems (MIS) at the University of New Mexico, and says he will pursue a graduate degree in Teaching and Learning Technologies. ●JG

## Merging onto the Info Highways, and More

Evans Craig's work with young Native Americans doesn't end with Countdown to Supercomputing. He is currently designing a new network that links American Indian Science and Engineering Society (AISES) student chapters, located primarily at colleges and universities, to NMTechnet, a node on the primary information highway used by scientists, students, and educators in the southwest.

The system will not just be an electronic mail system for Native American students, he says, but a full-fledged computer network providing access to a variety of national data bases, libraries, and current studies and supporting a full range of research. "We don't just want to catch up with the world," he says. "We want to use the network to its full potential so we can become leaders in educational technologies."

He says local chapters will be encouraged to do their own preparation for network hook-up, including ordering and connecting hardware and software. "That way, the students become the experts on campus in using the system," he says.

The regional network is serving as a test-run for a similar, national network that will use satellite links and fiber-optics to connect the 96 AISES student chapters nationwide. Other

AISES chapters, professional societies, and grade schools will be added in early 1994 to create a national educational network for Native Americans.

Evans is also a member of the National Science Foundation's Dream Team, a group trying to change the criteria the government uses to award research grants to Native Americans. "For purposes of grants, we are lumped in as minorities," he says. "Yet we are the only minorities that have to 'prove' we are members of a legitimate tribe."

He is also helping develop a computer tutorial that lets Native American high school students master college entrance exams. "Students might be among the smartest in the world, but if they can't take the test, it might affect them their whole lives," he says.

A member of Sandia's American Indian Outreach Committee, Evans helps teach a Sandia-sponsored science education program called Dream Catchers. Local Native American middle school students meet periodically for hands-on science and technology demonstrations. "We teach the kids how to use desktop publishing software to produce a newspaper in three hours, among other things," he says.



**What Do You Think?**

# Sandians Recall People Who Influenced Their Lives

"What Do You Think?" features employee responses to questions posed by the LAB NEWS. Some responses have been lightly edited and condensed to meet our maximum word limit.

The current question: "What person has had the biggest influence in your professional life? In what way?"

This question cannot be limited to any single person. I would have to begin with my father, who helped me recognize the importance of choices. Secondly, the first attorney for whom I worked was a "gentleman's gentleman" and instilled in me a high regard for the legal profession and a large degree of self-confidence. Thirdly, J. Edgar Hoover, for whom I worked many years ago. Even though his reputation has been tarnished since his death, and even though he was extremely dictatorial, his demand for perfection and excellence from the entire staff of the FBI promoted a sense of pride in one's work and a strong desire to produce a quality product.

*Betty Turk (11300)*

My first boss at Sandia, Ted Gold, is the most empowering person I've run across. He gave me assignments that forced me to stretch myself technically and to have a national impact. He gave me a lot of latitude, but he was always available to give me sage advice whenever one of the inevitable stumbling blocks appeared. He gave me the skills needed to become a director.

*Patrick Eicker (2100)*

**The Next Question**

## What Do You Think?

Here's the next question:

**Where and how do you see the Labs' value of teamwork being practiced (in your organization or elsewhere)?**

We'll be calling some Sandians and asking you personally to respond to the question. If you agree, we'll fax you a one-page answer sheet (with guidelines) that you can complete and fax back to us. Other employees are also welcome to respond — not just the folks we call. If you'd like to respond, please call us for a form on 844-7841 or 844-7522.

This question has really made me think. A great test of memory. I've been fortunate to have had many positive people influence my life, but the person who most influenced me was Arlyn Pepmueller, a former Sandian, now deceased. He was the first manager to provide me real career guidance. He was not my manager when he began, but later was my supervisor for a few years. He would stop me in the hall sometimes and give me very pleasant, constructive criticism. If my career can be considered a success, it is largely due to Arlyn's influence.

*Don Wagner (8532)*

Lee Iacocca. When I read his autobiography, I found a common man doing uncommon things. I realized that managers are people, and this put them on my level. Removing the mystique also removed the fear and tension. This has enabled me to relax and do my job.

*Ed Shoaf (5719)*

Like most who attended graduate school, I was influenced a great deal by my major advisor. However, I would say that the supervisors and managers for whom I have worked at Sandia have collectively had the "biggest influence in my professional life." And, among that group, Lou Cropp (6474) and Ben Bader (now retired) have been particularly helpful and supportive at critical decision points, always encouraging and often pushing me to go beyond my comfort zone.

*Bill McCulloch (6515)*

It's a unique pleasure to recognize a mentor, a role model, and a friend. Ray Viskanta, my major professor at Purdue University under Sandia's Doctoral Study Program, was all of these to me. More than 22 years have elapsed since my Purdue days, but I can still say that Ray has had the greatest influence on my professional life. His uncompromising pursuit of excellence, his depth of knowledge in diverse fields, and his tireless search for the truth simply and elegantly stated have been inspirations to me over the years.

*Martin Abrams (8114)*

●JC

**Mandatory by Feb. 1**

## Employees Asked to Encourage External Correspondents To Use New Mail Stop Numbers to Help Speed Delivery

Most Sandians are using the new four-digit mail stop numbers assigned last month, says Sandia/New Mexico Mail Services Team Supervisor John Ayala (7613-2), but they can help speed internal mail delivery even more by encouraging their external correspondents to use the new numbers.

John announced the new system in an early November memo to employees and contractors. His team and Sandia/California Mail Distribution Team 8533-1 started delivering to mail stops right away instead of to organization numbers, which have a history of changing.

The memo included mail stop numbers for nearly all Sandia groups and detailed instructions for sending mail internally. (These instructions are not repeated in this article; any employee who did not get them may ask his or her secretary or call 845-6245 in Albuquerque or 294-2429 in Livermore.)

**Attention: Outside Correspondents**

Sandians are asked to provide their mail stop numbers and complete addresses to their customers and other external correspondents; change-of-address cards are available from your mail carrier. Customers and correspondents who do not get notified are encouraged to ask their Sandia contacts for their mail stop numbers and begin using them as soon as possible.

For external mail coming to Sandia/New Mexico, here is an example of the address style that should be used for someone whose mail stop number is 0413 (note that the mail stop is repeated as the last four digits of the zip code):

Sandia National Laboratories  
Name of Person  
MS 0413  
P. O. Box 5800  
Albuquerque, NM 87185-0413

The proper style for mail coming to Sandia/California is slightly different because the last four digits of the zip code (0969) are set and cannot be changed. Here is an example for someone with a mail stop number of 9281:

Sandia National Laboratories  
Name of Person  
MS 9281  
P. O. Box 969  
Livermore, CA 94551-0969

John says the mail teams understand it will take employees and correspondents a while to adopt the new system completely, so the teams will do their best to deliver to both organization numbers and mail stop numbers from now until Feb. 1. The new system becomes mandatory then and mail stop numbers should be used exclusively. All Sandia groups will retain their organization numbers for other purposes, but these numbers should not be used on mail after Feb. 1.

●LP



BEN RICKERT (left) of Tritex and Bill Edgar (7613) discuss results of a trial run on the Ultra Sorter that Rickert's company installed at Sandia to speed and improve mail sorting under the new mail stop system. Bill says the new machine in Bldg. 894 is being programmed to go on-line in January. (Photo by Randy Montoya)



On the Secretarial Side

# New Secretarial Quality Process Council Picks Up Speed

Sandia's new Secretarial Quality Process Council (SQPC) is up to speed with new projects and ideas designed to help make secretaries' jobs easier and allow work to flow more smoothly. Members of SQPC teams are now working to implement new ideas and improve communication among secretaries and office administrative assistants, according to SQPC chairperson Alex Ryburn (4700).

"New Council bylaws are being prepared and are expected to be published and delivered to Sandia secretaries by the end of December," says Alex. The bylaws define the SQPC's mission, self-nomination process, objectives, and individual and team assignments and responsibilities. Members of the SQPC include a chairperson, vice-chairperson, secretary/historian, and five major teams, including conference, newsletter, mentor program, outreach, and work-process review teams. The SQPC also

has an advisory board composed of members of the previous secretarial council and other staff and management who support its activities.

### Lunching with the Brass

Recent SQPC activities include hosting secretarial luncheons with members of management as guest speakers. Human Resources Vice President Charles Emery spoke with secretaries Sept. 7 and 8. These luncheons will be held quarterly. The next luncheon, scheduled for January, will include a training session on budget organization procedures.

The quarterly *SWAPS Newsletter* has been reformatted and renamed the *SQPC Connection*. The first issue appeared in November. Carol Stocks (1900) is the acting editor, assisted by roving reporter Nancy Campanozzi (12630), who will

interview Sandia secretaries about what's going on in their organizations. Secretaries are encouraged to submit articles and story ideas to Carol.

Secretaries new to Sandia now have someone to provide support and guidance as they learn about Sandia's special requirements. SQPC's new Mentor Program, led by Kris Matthes (2334), was initiated in September. New secretarial trainees in the class that came on board Sept. 7 and 13 were the first to be assigned individual mentors, who introduced them to management and staff and showed them around the Laboratories. Mentors will continue to be personal consultants, professional critics, and friendly advisors to new secretaries to help them through their first few months at the Labs.

### Teams Help Streamline Procedures

The SQPC's Work Process Team is looking into improving the current travel process. A workshop was held in late July with Elveta Bishop (7601) to process and prioritize the input received from secretaries about work processes during the 1992 Secretarial Conference. The two areas that emerged as high priorities were travel procedures and education and training for secretaries. The team, headed by Elaine Lieberman (5951) and Sophia Garcia (10500) hopes to work with others involved in travel processes, staff, and management to come up with an improved process and document the benefits of the proposed changes.

The SQPC has also been asked by management to become involved in other areas at Sandia that need changes, including the mail room process and automated time card process. The group may also get involved in producing a new secretarial office procedures manual, using the preferred process designed by Financial Requirements/Corporate Policy Dept. 10507. Secretaries are encouraged to join Council team members in working on its projects. To volunteer, contact Judy Borrowdale (2000) on 844-9269. ●JC

## Sandia News Briefs

### Michael Moulton Named Transportation Alliance Vice President

The Alliance for Transportation Research has named Michael Moulton of Advanced Transportation Programs Dept. 9604 as its vice president for engineering research. The Alliance is a partnership formed in 1991 by Sandia and Los Alamos national laboratories, the University of New Mexico, New Mexico State University, and the New Mexico State Highway and Transportation Department to address transportation issues from a broad-based perspective. Michael has worked on programs in transportation, environment, communications, and security. He has been with Sandia since 1979 and remains on the staff; his assignment with the Alliance is temporary.

### Sandia and Goodyear to Work on Tire Materials, Manufacturing Processes

Sandia and the Goodyear Tire & Rubber Company announced recently that they have agreed to work cooperatively on two projects. One will use computer modeling to help predict tire performance and improve manufacturing processes. The result for the Labs will be an extension of modeling capabilities; for Goodyear, availability of more advanced tools for designing and making tires. The other project will use neutron scattering and other analytic technologies to study the structure and properties of materials that might be used for making better tires. Goodyear, the only remaining major American-owned tire manufacturer, operates eight tire-making plants and nine industrial rubber product plants in the US.

### Standard Laboratory Managers Meeting Held in Albuquerque

Sandia's Primary Standards and Calibration laboratories jointly hosted the 1993 DOE/AL Standard Laboratory Managers Meeting Oct. 11-14 in Albuquerque. This annual meeting is held to discuss management of the Standards and Calibration Program for DOE contractors involved in the nuclear weapons program. The meeting is rotated each year to a different contractor site so managers can see first-hand how the Standards and Calibration Program operates at other sites. This was the first meeting in Albuquerque since 1980. Richard Pettit, Manager of Primary Electrical Standards Dept. 1042, was the general chair, and Jim Simons, Manager of Calibration and Instruments Dept. 1044, was the local chair for the event.

Send potential Sandia News Briefs to LAB NEWS, Dept. 12660, MS 0413.

To: Karen Shane, 12640, MS-0413

## Volunteer Information Survey

The newly formed Community Relations Dept. 12640 would like your help in updating employee and retiree volunteer activities. We'd like to know what community projects and programs you're working on now. This will give us a basis from which to evaluate and respond to community needs. If you currently volunteer in an organization, please fill out this form and return it.

Community agencies or organizations where you volunteer your time	Check if you are a member of its board of directors	Hours of volunteer time you give per year
_____	_____	_____

Appointive government advisory or policy-making board where you volunteer your time	Hours of volunteer time you give per year
_____	_____

Name: \_\_\_\_\_ Org.: \_\_\_\_\_ MS: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Address (if retiree): \_\_\_\_\_

### TLC Offers December Seminars

The Total Life Concept (TLC) program is presenting a series of seminars this month to help Sandians stay healthy through the holidays. Here are locations and times:

Bldg. 960, Room 113 — Mondays, noon-1 p.m.: Dec. 6, "How to Develop an Exercise Prescription"; Dec. 13, "Low-Fat Gifts from the Kitchen."

BDM Auditorium — Wednesdays, noon-1 p.m.: Dec. 8, "Managing Holiday Stress"; Dec. 15, "Muscles Do Matter."

Technology Transfer Center (Bldg. 825) — Thursdays, noon-1 p.m.: Dec. 9, "How to Develop an Exercise Prescription"; Dec. 16, "How to Celebrate and Avoid Holiday Weight Gain."

## Employee Death

Luciano Mora of Customer Interface and Business Methods Dept. 2403 died Nov. 14 after a long illness.

He was 59 years old.

Luciano was a member of the technical staff and had been at Sandia since 1966.

He is survived by sons Richard, Steven, Michael, and Daniel.

## Retiree Deaths

Ronald George (81) .....4513 .....Oct. 8  
 Robert Williams (75) .....3612 .....Oct. 13  
 W. M. Folks (75) .....8443 .....Oct. 18  
 Matt Bustos (68) .....3425 .....Oct. 18  
 Clinton Henry (85) .....7222 .....Oct. 30



# MILEPOSTS

## LAB NEWS

December 1993



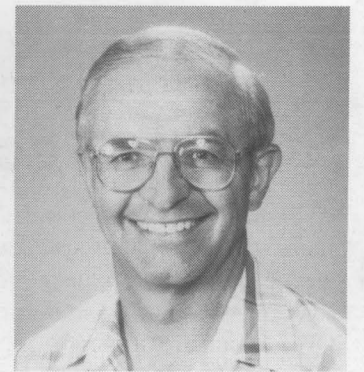
George Perkins  
10402

35



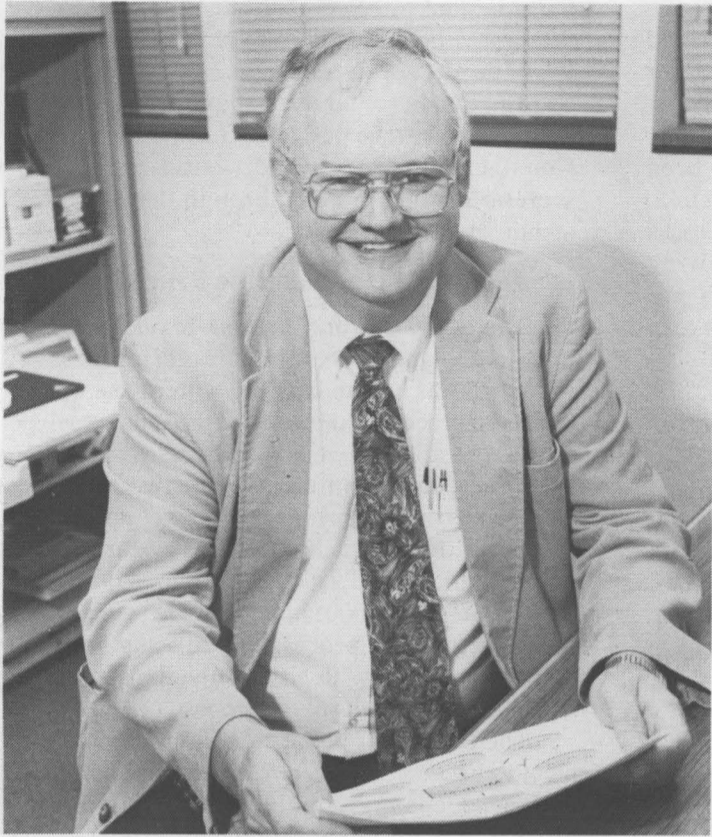
Mary Kay Austin  
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15



Bruce Nevin  
5354

30



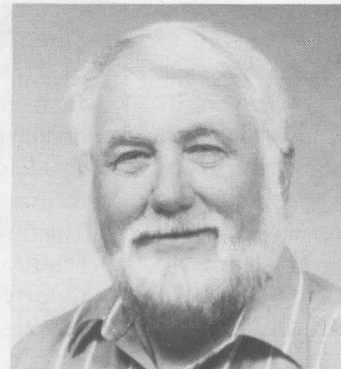
Robert Lederer  
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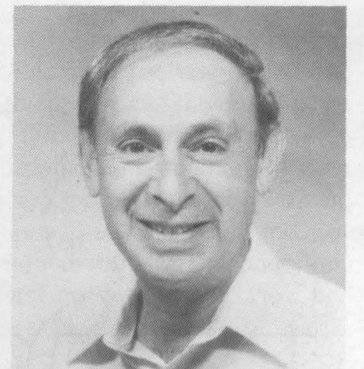
Robert Johnston  
1841

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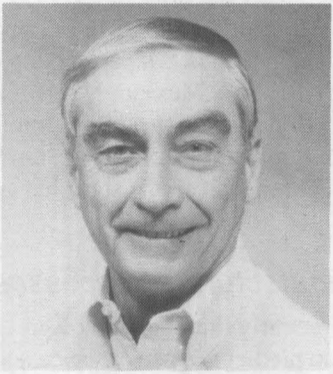
Henry Street  
2523

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Morton Lieberman  
9823

25



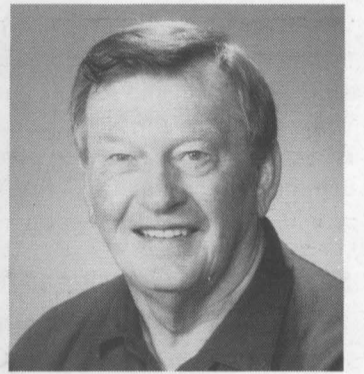
James Greenwoll  
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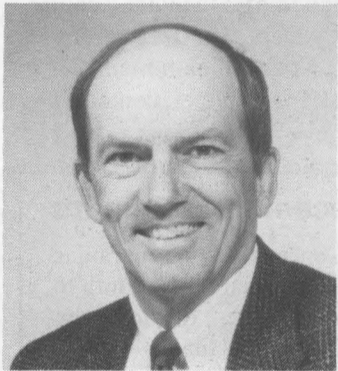
Mary Cocco  
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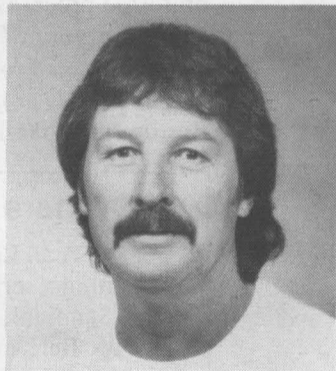
Connie Visbeck  
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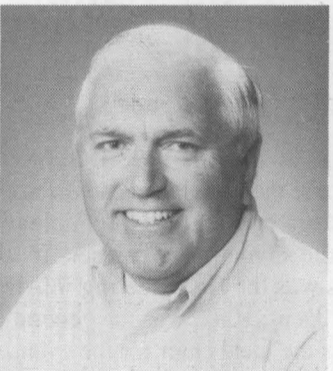
Dan Hartley  
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Al Baca  
7815

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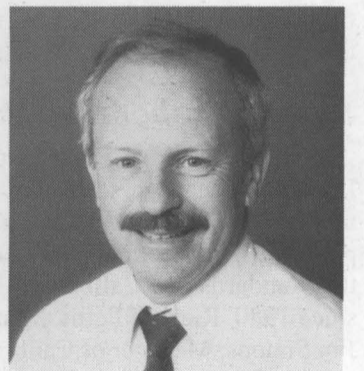
Colin Hackett  
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20



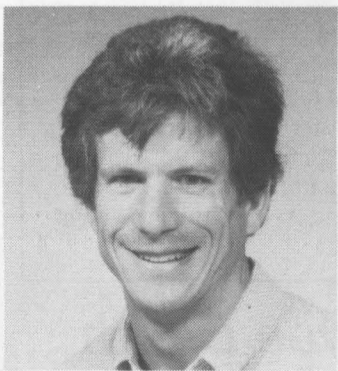
David Gangel  
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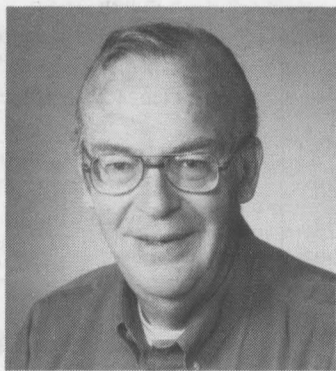
Ed Cull  
5354

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Alexander Maish  
6213

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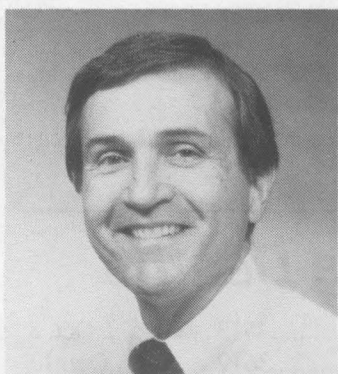
Charles Bisson  
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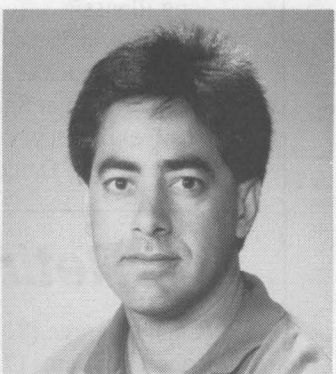
Jean Prusak  
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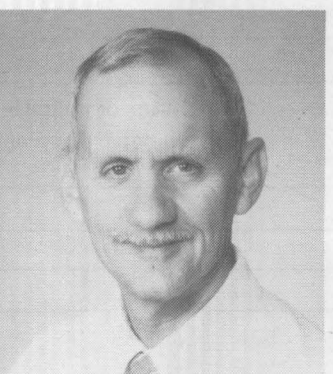
Albert Hodapp  
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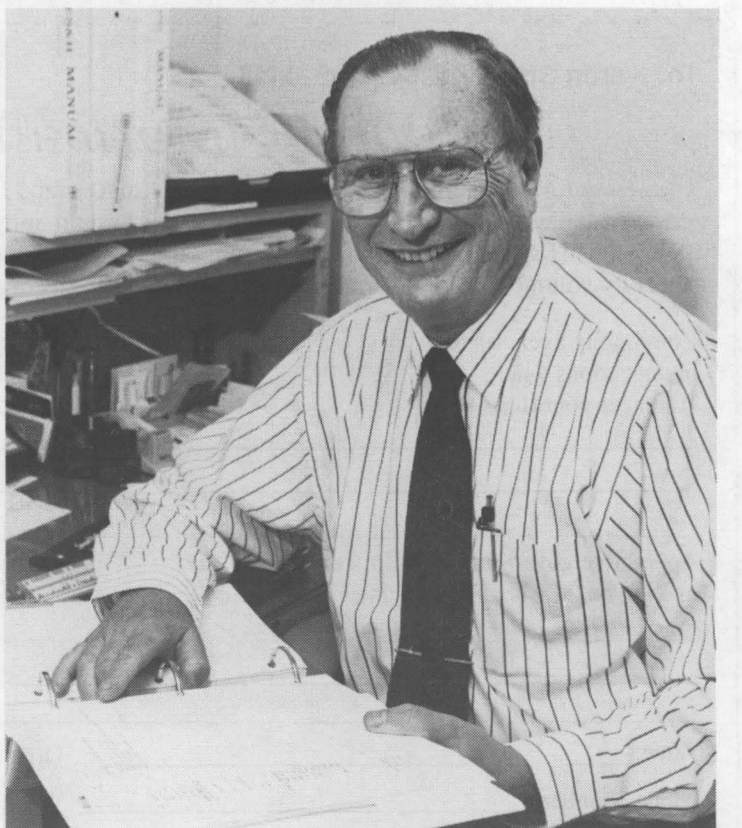
Larry Carrillo  
8283

15



James Pate  
8525

15



Allan Fine  
7733

40



## UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

**Deadline: Friday noon before week of publication unless changed by holiday. Mail to Dept. 12660, MS 0413; or fax to 844-0645.**

**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**

WATER SOFTENER, Sears Kenmore "Cycle Miser 80," softens fine manually; automatic regeneration erratic, new cost \$600, asking \$150. Schkade, 292-5126.

TAHOE TIMESHARES, South Shore, adjacent to Heavenly Ski Resort, one and two bedroom suites, one week/year, bonus time, upgrades, worldwide exchange. Ingwerson, (510) 455-5024.

BROILER/GRIDDLE/DEEP FRYER COMBO, Jenn-air plug-in unit, \$125 OBO. Bailey, 281-4383.

K2 SKIS, Laser 180, Tyrolia 360D bindings, \$50; San Giorgio boots, size 11-1/2, \$15. Oberkamp, 292-4366.

FURNITURE, Simmons crib w/mattress, dresser, and changing table, natural maple, looks new, \$400 for the set. Bauer, 299-0640.

REAR VIEW MIRRORS, OEM left and right, for Ford Ranger or Bronco II, new, \$20. Fowler, 888-1348.

BINOCULARS, Steiner, 15x80 Commanders, \$700. Jimenez, 296-9256.

GAS RANGE, 30-in., Sears deluxe, excellent condition, \$100. Rhode, 298-0579.

OSCILLOSCOPE, 5MHz BW, triggered sweep, portable, \$75; digital multimeter, 2-1/2-digit resolution, portable, AC-powered, \$35; metal cabinets, assorted, \$10/ea. Stuart, 265-7315.

NORITAKE CHINA, Cook 'n Serve, Maplewood pattern, seven place settings plus extra serving pieces, 60 pieces total, \$50. Bear, 881-7128.

BOOKS, Reader's Digest Condensed collection, 1954-1991, more than 148 books and 600 stories, good condition, \$48. Lane, 299-7925.

ELECTRONIC KEYBOARD, Casio Model CT-390, portable, 49-key, 210 tone bank, \$55. Hoskie, 292-5472.

SCHWINN EXERCISER XR-8, minimal use, new cost \$250, sell for \$75. Hampton, 293-1824.

WOOD BURNING STOVE, brick-lined, heats approximately 1,200 sq. ft., good condition, \$275. Eisenberger, 877-7041.

ORGAN, Hawaiian, has guitar, accordion, trumpet and other instruments on it, beautiful, \$900. Haynes, 293-7038, leave message.

BUNK BEDS, pine, medium finish, w/mattresses and matching chest of drawers, \$175. Leslie, 293-0339.

CHRISTMAS TREE TABLECLOTH, 70" x 52", green w/silver trim, \$5; microwave popcorn popper, \$3; movie screen \$10. Hoff, 296-7391.

PIANO, Chickering and Son, 62x38x25, mahogany, excellent condition, see and play to appreciate, appraised at \$1700, asking \$1,300. Hueter, 242-1620.

TREADMILL, 1.25-hp, auto-incline, 8 mph, \$250; contour lounge chair, auto massage, woodrose. Both in excellent condition. Russell, 865-0356 after 5 p.m.

GUN, Smith & Wesson Model 19/357, 2-1/2-in. barrel, blue finish, w/250 rounds Wadcuter ammunition, like new, \$300. Corcoran, 265-1694.

ELECTRIC RANGE & DISHWASHER, GE, harvest gold, clean, good condition; marble bathroom vanity w/sink, 22"x52", best offers. Farmer, 857-0503.

AQUARIUM, 29-gal., w/7-in., orange Oscar, and two 10-in. Plecostmus (algae-eaters), includes heater, filter, air pump, gravel. Dubica, 296-6557.

MAN'S SKI JACKET & PANTS, Descender; car tire cables and chains. James, 294-6837.

ELECTRIC TYPEWRITER, Silver Reed EZ 20, w/two extra print wheels, excellent condition, \$75. Veltkamp, 266-0564.

PLAYHOUSE, Fisher Price, great Christmas gift, brand new, paid \$125, asking \$60; scooter, \$15. Wilcoxon, 296-8295.

FUR COAT, blush fox, \$1,200 new, sell for \$400 OBO; aquarium, 10-gal., fish/accessories, \$25; ski rack, \$25. Huff, 296-3788.

PFALTZGRAFF DISHES, Yorktowne pattern, 50-piece service for ten, \$100; many additional pieces. Fisher, 275-3869.

OAK OCCASIONAL CHAIRS, four; RCA stereo cabinet; coffee table. Crumley, 299-5293.

TOW BAR, Duncan, self-aligning, \$150; '84-'85 Honda mount, \$25. Bear, 881-7128.

YAMAHA KEYBOARD, Portatone, Model PSR-15, w/AC adapter and carrying case, like new, \$100. Smith, 296-1908.

BEDSPREADS, twin-size, two pink, \$50; two gold velour, \$50; blue drapes, 100"W x 84"L, \$50; traverse rod, 84-152"L, \$10. Porter, 884-4577.

MAGNAVOX STEREO, ivory cabinet, contains AM/FM radio, auto-tunable, cassette player/recorder, two microphones, 100 records, \$150. Meidal, 255-6690.

WATERBED, queen-size, w/tulip lamps on headboard, medium-dark wood finish, includes padded rails and heater, good condition, \$100. Heckart, 828-0470.

CARPET, gray, commercial-type, many pieces, 9x11, 8x9, and many 6x4, good condition, all for \$20 OBO. Chavez, 842-6374.

CEMETERY LOTS, two, Sandia Memory Gardens, "Mercy Garden," \$1,400. Sena, 299-1026.

FRENCH HORN, "single," in good condition, \$400. Peters, 293-6356.

DINETTE SET, 5-piece, glass top, light oak/brass frame, chairs have upholstered seats, good condition, \$60. Dennis, 884-9125.

REFRIGERATORS: Hotpoint, 19 cu. ft., over-under, \$300; GE, 17.5 cu. ft., side-by-side, \$250. Both almond, 12 yrs. old, run perfectly. Moving boxes. Rechar, 292-1754.

SOFA SLEEPER, queen-size, brown, \$150; La-Z-Boy, tan, \$50; upholstered chair, \$20; Sears microwave, \$80; two sewing machines, \$75 and \$125. Montano, 892-0987.

OVERSIZED SOFA, loveseat, teal-green velour, excellent condition, \$1,000 OBO; wooden bunk beds, sheets, blankets, best offer. Alderson, 293-5112.

DINETTE SET, table w/glass top, four chairs w/rollers, good condition, \$200. Nelson, 292-5067.

SILVER COFFEE/TEA SERVICE, 5-piece, w/footed tray, excellent condition, \$150; antique "Tom & Jerry" set, bowl w/15 mugs, \$90. Vanderhoofven, 298-5661.

SNOW TIRES, studded, P205/75R14 radials, on 14-in. wheels, excellent condition, \$30/ea. or \$50 for the pair. Dybwad, 296-9047.

SPARE TIRE HOLDER, for Ford van, new, never used, \$10. Garcia, 293-3937.

LOBO BASKETBALL TICKETS, two good seats, Lobo Classic Tournament, Dec. 3 and 4; Texas Pan American, Dec. 18, \$7/ea. ticket. Cooper, 888-4150.

TREADMILL, Sears Lifestyley, w/maintenance agreement, 3,500 ps, 4-user programmable, 8 mph max., auto incline; monitors speed, pulse, distance, \$395. Caskey, 298-6428.

MAYTAG WASHER, \$85; white cane chandelier, \$10; girl's white roller skates, \$10; Atari w/20 games, \$15. Lippis, 898-8429.

EXERCISE MACHINE, DP Air-Strider, including pulse monitor, timer, and mileage indicator, \$75. Austin, 831-2511.

VENTURA SPANISH GUITAR, w/hard shell case, \$125; camper shell for short-wide bed, economy-size pickup, \$125. Asbury, 293-9358.

SILVER-FOX JACKET, Chevron design, size 10, original cost, \$650, sell for \$250. Kelly, 237-9709.

CHEV. BEDLINER, for long-wide box, \$75; three tool boxes, \$100. Green, 898-3791.

COUCH, loveseat, chair, black w/gold trim, paid \$950, sell for \$400. Greenier, 831-2969.

TYPEWRITER, Smith-Corona SD300, w/Spell Right, excellent condition, \$100. Rainhart, 821-3690.

KNITTING MACHINES, Brother 910 Electronic and 260 Bulky, more than \$10,000 in equipment, yarn, supplies, books, sacrifice for \$3,000. Walker, 821-4059.

SKI BOOTS, Soloman SX-81, rear-entry, men's size 10, good condition, \$40. Pietta, 281-4277.

PUPPIES, free; rabbits, \$5; rabbit cage, \$15; hamster cage, \$15; bowling balls, \$5; bar stools, \$10; humidifier, \$15. Parr, 837-1719.

GAS RANGE, older model, works perfectly, \$85; dinette set, \$30. Both avocado green. Non-electric (crank) hospital bed, \$75. Baker, 888-4220.

PUPPY, German Shepherd-cross, male, followed my husband home, needs a permanent home. Negin, 294-3117.

JUMBO BASSINET, w/extra pad, \$30. Korbin, 299-9088.

NINTENDO, w/Power Pad, Game Genie, and eight game cartridges including *Battletoads* and *Mario Brothers*; Game Boy cartridges. Patterson, 822-1196.

EXERCISE BIKE, Schwinn, w/accessories, \$100. Esterly, 296-9759.

SEGA GAME GEAR, w/AC, car adapters, and four games, *Sonic 2*, *Joe Montana*, *Columns*, and *Super Monaco GP II*, \$110. Parker, 291-9410.

MITSUBISHI TV, 27-in., stereo console, walnut, 5 yrs. old, needs minor repair, \$190. West, 292-2271.

OAK ENTERTAINMENT CENTER, 36"H x 56" L x 17"W, smoked glass doors, two shelves, covered TV area, fits 23-in. TV, excellent condition, \$135. Rockett, 298-2589.

STEREO AMPLIFIER, Perreux PMF-2150B, above average 200W MOSFET, very good condition, \$2,000 new, sell for \$500. Damkroger, 897-7627.

LEATHER RIDING PANTS, Harley Davidson, 32" waist, 31" length, new condition, \$50. McDonald, 899-8578.

SHEEPSKIN COAT, Overland Shealing, women's size 5, new condition, cost \$695, asking \$375. Babcock, 299-3121.

CAMERAS: Canon FTB, 50mm f1.4, 28mm f3.5, assorted filters, flash attachment, \$200. Minolta Himatice, 40mm f1.7, flash attachment, \$40. Marrs, 821-5144.

CAR SHOP MANUAL, 5-volume set, Ford 1975-1976, \$15; owner's workshop manual for Ford Mustang II, 1974-1978, \$8. Wyatt, 298-0371.

CHAIR, orange leather and chrome, \$100; area rug, yellow wool, 6x9, \$100; two occasional tables, \$50/ea. Renken, 296-9713.

CRIB, Simmons, w/mattress, like new, \$250; extra crib mattress; push mower, fireplace glass doors and screen. Ballard, 828-2504.

NINTENDO ENTERTAINMENT SYSTEM, w/ten game cartridges, *Mario Brothers*, *Zelda*, *Top Gun*, *Home Alone*, \$150 for the set. Hosking, 823-9512.

DAY BED, white wicker, \$100; girl's canopy bed, full-size, box spring and mattress, \$100. All in good condition. Lanes, 291-0324.

REFRIGERATORS: GE, '93 model, frostless, all white, 22.5 cu. ft., \$700; Whirlpool, 17 cu. ft., almond, frostless, \$300. Wade, 293-6401.

PATIO TABLE, 53-in. diameter, redwood and black iron, w/four matching chairs, \$50. Roberts, 255-9527.

PIANO, dark brown, Currier Spinnet, excellent condition, \$750 OBO. Bouchard, 265-8148.

CRIB, solid oak, hand-carved design, excellent condition, \$200 firm. Pierce, 299-2801 day or evening.

TOOL CABINET, Sears Craftsman, 3 drawers plus bottom compartment, small roll-a-way, \$50. Ottinger, 296-3526.

CHEST OF DRAWERS and nightstand, solid oak, '50s style, by Sleigh; microwave and cart; wok. Dunn, 293-5170.

BEDLINER, fits '88 Dodge Ram 50, \$60; luggage carrier for motorhome, \$40; cradle, \$25; camper shell for '90 Isuzu, \$500. Sanchez, 831-4906.

WATERBED, queen-size, w/9-drawer dresser, solid oak, 6-drawer pedestal, headboard, semi-motionless, excellent condition, \$650. Lunsford, 897-9557.

YAMAHA PIANO, true quality, beautiful walnut, console, full keyboard, includes bench, excellent condition, leaving state, \$1,675. Fjelsest, 857-0240.

TELESCOPE, astronomical, Jason, 450 power, \$100; camera, Rollei B35 compact, 35mm, w/case, mint condition, \$75. Abbott, 298-2039.

MATCHING FURNITURE: 3-cushion sofa, loveseat, chair, ottoman, end table, and coffee table, heavy wood construction, \$400. Bozone, 294-1127.

LIGHTED DISPLAY CASE, glass, 6 shelves, 18", 8", 27" high, \$15; antique branding irons; printer's trays; wall collections. Peterson, 256-7514.

EXERCYCLE, \$30. Miller, 822-0008.

**TRANSPORTATION**

SNOWMOBILES: two Yamaha 340cc, '79 and '81, Model ET340, w/trailer, tuned for NM, always covered, run great, sell separately or all for \$2,700. Roybal, 836-5062.

TOTE BIKES, two, Sears 3-spd., ideal for RVs, \$35/ea. Bear, 881-7128.

VW SINGLE-CAB PICKUPS, two '61 models, one '70 model, no engines, \$450-\$1,650. Roberts, 1-864-3529 after 7 p.m.

'83 CHEV. PICKUP, 350, PB, PS, AT, AC, \$3,800 OBO; '34 Buick, 4-dr., sedan, \$2,500; '68 Camaro, 350, AT, PB, \$2,500 OBO. Cortez, 869-3416.

'90 KAWASAKI VULCAN SE, black, 1,500cc, 15K miles, w/extras, clean, \$4,995. Ask for Gary. Boruff, 298-4365 after 4:30 p.m.

BICYCLE, Schwinn, 10-spd., like new. Crumley, 299-5293.

BICYCLE, 10-spd., 27-in., \$30. Hoskie, 292-5472, leave message.

'85 FORD RANGER, new tires, runs well, needs body work. Archibeque, 256-1356.

'86 MONTE CARLO, 56K miles, V6 AC, tilt, tinted windows, new battery and tires. Laderach, 888-0712.

MOUNTAIN BIKE, girl's 20-in., 5-spd., pearly pink, excellent condition, \$95 OBO. Froehlich, 296-5226.

'79 CADILLAC SEDAN DE VILLE, 4-dr., 97K miles, loaded, creampuff, excellent condition, \$3,000. Montano, 892-0987.

'79 PORSCHE 928, loaded, 5-spd., leather interior, pampered, crown jewel of Porsche's line, \$9,200. Philbin, 828-2413.

'88 FORD MUSTANG GT 5.0, 5-spd., dark blue, AC, PW, PL, \$6,800. Romero, 268-2947.

'81 HONDA 185sXL MOTORCYCLE, 4K original miles, helmet and repair manual included, like new, \$675. Mattingley, 292-0722.

'86 CORVETTE COUPE, 35K miles, red w/tan interior, excellent condition, \$13,800. Lang, 292-3421.

'83 MERCURY MARQUIS BROUGHAM (intermediate), AT overdrive, AC, electric seat adjust, widows, locks, AM/FM cassette, \$1,100. Mendel, 265-3840.

'67 FORD ECONOLINE VAN, 3-spd., manual transmission, 104K miles, wire security mesh in back, white, \$550. Baker, 888-4220.

'88 HONDA CIVIC, 4WD, AM/FM cassette, tan, 49K miles, good condition, \$5,000 OBO. Knox, 255-3214.

BICYCLES, two, \$40/ea. Green, 898-3791.

'82 YAMAHA VIRAGO, 750cc, Fairing and Vetter bags included, approximately 20K miles, needs battery, \$850 firm. Romero, 294-4709.

'74 450 SL, both tops, partial restore, nice; '89 Chrysler LeBaron premium convertible, all options. French, 298-9292.

'92 MAZDA MIATA, red, "A" package, AC, bra, 25K miles, perfect condition, absolutely adorable under a Christmas tree, \$13,800. Damkroger, 897-7627.

'86 CHEV. CELEBRITY STATION-WAGON, 70K miles, V6, AT, AC, tilt, cruise, excellent condition, \$3,400. Walker, 821-4059.

'71 MERCURY COMET, 2-dr., AT, AC, 6-cyl., good mileage, excellent mechanical condition. Stronach, 298-5289.

TOURING BIKES: Man's Centurion, LeMans 18-spd; woman's Nishiki, Custom Sport, 15-spd., \$75/ea. Miller, 822-0008.

'79 SUBURBAN, 4WD, 3/4-ton, 350 V8, manual transmission, new HEI ignition, front and rear AC, PS, PB, dependable. Harstad, 298-6551.

'91 EAGLE TALON, all-wheel drive, turbo, anti-lock brakes, AC, all power, sunroof, leather seats, CD, new tires, \$15,000. Pelock, 292-0379.

'88 PONTIAC FIREBIRD, V6, AT, AM/FM cassette, AC, tinted windows, new tires, very clean, excellent condition, \$5,100. Archuleta, 877-2706.

'88 HYUNDAI EXCEL, white, 4-dr. sedan, 57K miles, AM/FM cassette stereo, excellent condition, reduced to \$2,900. Rochau, 888-1501.

'87 FORD T-BIRD TURBO, low miles, new brakes, AT, AC, power this 'n' that, \$5,000. Geer, 265-2094.

BICYCLE, Schwinn Varsity Sport, blue, 24-in., 10-spd., excellent condition, \$75. Snyder, 298-2923.

'91 FORD EXPLORER XL, 4x4, one owner, AC, tilt, cruise, split bench, cloth interior, tinted windows, very clean, excellent condition. Sanchez, 873-2058.

BICYCLES: boy's 24-in., 12-spd., \$20; girl's 16-in., \$10; boy's 20-in., \$10. Orand, 275-2255.

'86 MERCEDES, 300 SDL, turbo diesel, classic extended body, low mileage, immaculate, \$24,000. Williams, 856-5722.

'82 FORD ESCORT, new tires, good condition, excellent second car, \$1,200. Sanchez, 831-4906.

**REAL ESTATE**

HOUSE, 1,224 sq. ft., good shape, buyer financing in Belen, by owner. Roberts, 1-864-3529 after 7 p.m.

3-ACRES, Bayfield, CO area, between Lemon and Vallecito Lakes, \$25,000. Pierce, 268-6057.

2-BDR. TOWNHOUSE, Central/Tramway area, 2 full baths, 2-car garage w/opener, fireplace, sunlights, more, \$75,500. Romero, 294-4709.

**WANTED**

PROFESSIONAL MESSAGE TABLE. Hymer, 293-6029 evenings.

FRISBEE PLAYERS, all skill levels, to form frisbee or ultimate club for noon or after work. Bailey, 281-4383.

LAND FOR CABIN SITE, in Manzano Mountains, Tajique/Torreon Road area and Jemez Mountains. Davidson, 293-9486.

FREEZER, chest-type, 12 cu. ft. or larger. Farmer, 857-0503.

WHEEL CHAIRS, for our church, donation or reasonably priced. Chadwick, 275-2368.

HOUSESITTING POSITION OR RENTAL, mid-January, for approximately six months, couple, toddler, and cat. Friedrich, (801) 595-6891.

FOUR-WHEEL-DRIVE PICKUP, Nissan or Toyota, '86 or newer, in the \$6,000 price range. Archibeque, 256-1356.

METAL STORAGE LOCKERS; cross-country ski set-up for child, about size 4; electric bass guitar for beginner. Kureczko, 281-8206.

LABRADOR, male, chocolate or yellow, medium size, to breed with my Lab, AKC-registration required. Garcia, 293-3937.

MATTRESSES, twin and/or full-size, for bunk beds. Parr, 837-1719.

RECEIVER HITCH, Class III, for '92 full-size Chev. truck. French, 298-9292.

UNDERUTILIZED TREADMILL. Yaniv, 294-4490.

PROPANE TANK, 500-gallon minimum. Wilde, 281-4511.

LADDER for bunkbed. Orand, 275-2255.

**LOST & FOUND**

FOUND: Bicycle strobe light. Ginn, 844-2726.

FOUND: Chrysler car key, Nov. 16, Tech Area 1, just inside Gate 10. Ask for Holly. French, 844-2367.

FOUND: Konica camera case, black leather, in parking lot west of T-city, Nov. 17. Stop at T-70 to pick up or call 845-9839 or 845-3479 for more information.





**Coronado Club Activities**

**\$11.95 Gets You 14 Ounces, Plus the Poorboys**

LET LOOSE with the Poorboys — The Isleta Poorboys kick off the final month of '93 tonight, Dec. 3, and you know that means a rip-roaring time at the Club. They'll be playing their C&W tunes from 7 to 11 p.m. From 6 to 9 p.m., you can enjoy the best of the Club's culinary artistry: 14 ounces of T-bone steak for \$11.95, eight ounces of grilled halibut for \$10.95, or that old favorite, the all-you-can-eat-buffet, featuring baked ham, roast turkey, and baron of beef for just \$6.95. Call for reservations (265-6791).

BEST SHOT BRUNCH — It's time for a Sunday brunch buffet and tea dance once again on Dec. 12. Remember how much you enjoyed the last one? The cost is still only \$6.95 for adult members, \$7.95 for guests, \$1 for kids 4 to 12, and free for the 3-and-under set. Brunch is served 10 a.m.-2 p.m. The Best Shot Band plays for the

tea dance, 1-4 p.m. Brunch reservations are a must — call 265-6791.

BINGO CONTINUES, and so does the fun each Thursday evening this month, right up through the 23rd. Card sales and the buffet line open at 5:30 p.m., early-bird bingo is at 6:45, and the regular bingo games start at 7 p.m. Come on out — betcha you'll see someone you know!

GIVE SOMETHING NICE, to yourself or someone else. C-Clubbers, remember that the Club offers you discount movie tickets for General Cinema and United Artists theatres for \$4.50 each, tram passes for \$5 each (only six sold a day), the 1994 Entertainment Coupon Book, and a coupon for reduced prices at Disneyland and other Disney destinations.

**Sandia in the News**

This is a periodic column listing a selection of print and broadcast news reports about Sandia. It is provided by Media Relations Dept. 12630 to give Sandians a sense of what is being said about Labs work in national and international media.

Labs researchers are using their supercomputer to help them determine what might happen next July when parts of a comet — currently orbiting Jupiter like a string of pearls — crash into the giant planet, the *Chicago Tribune* reported. Defense Conversion also reported on the work. (See article on page one.)

*Business Week* reported that the Air Force is testing fuels and additives for heat resistance using a Sandia sensor that accurately detects fuel degradation.

Sandia's previously classified 3-D seismic capabilities being used by the oil and gas industry to quickly characterize the subsurface were highlighted in a lengthy *Houston Post* op-ed column.

During a Tonight Show monologue, Jay Leno referred to Sandia's sticky foam, which also was mentioned in the *Washington Post* as an important piece of technology needed to develop "less-than-lethal" weapons.

*Aviation Week & Space Technology* focused on a number of Sandia initiatives and accomplishments in a lengthy piece about technology transfer. It discussed Labs efforts with the US Advanced Battery Consortium, microchip/microexplosive R&D, the glucose sensor, and Martin Marietta's new Technology Ventures Corp. Quotes came from Paul Robinson (4000) and Warren Siemens (4200).

*Aviation Week* also ran an item on Sandia's work with Russia's Dnepropetrovsk Metallurgical Institute to investigate porous metals.

Bill Robinson (8702) was interviewed for *Automotive News'* thorough piece about anticipated contributions the national labs can make in developing a next-generation super-clean, super-efficient passenger car. The piece singled out Sandia work on engine knock, aluminum alloys, and fluid monitors. The piece also is being picked up nationally by dailies such as the *Raleigh (N.C.) News & Observer*.

London-based international wire service Reuters reported that Jeff Sniegowski's (1325) micro steam engine is "mounted on a silicon chip and barely visible to the eye" and that it "could operate microscopic tweezers and knives and prove an invaluable tool for doctors, researchers and communications engineers."

Techniques Sandians have come up with to increase the efficiency of recyclable plastics sorting was covered by *Photonics Spectra*, which added a photo of Suzanne Stanton (2338) and Greg Hebner (1128). The story points out that several companies have expressed interest.

Michael Allen and Martin Pilch (both 6422) are pictured in *Nuclear News*. The caption summarizes some of Sandia's recent nuclear power reactor safety R&D.

*Electronic Design* magazine reports that researchers from Sandia "are huddling with the Massachusetts Institute of Technology . . . and Motorola's Semiconductor Div. . . to develop a new type of multithreaded data-flow parallel computer."

Doug Drumheller's (6111) acoustic telemetry work designed to aid the drilling industry received major play in the *American Oil & Gas Reporter*.

A photo of John Crawford (VP 8000) showed up on page one of the *San Francisco Examiner's* coverage when the new National Information Infrastructure Testbed (NIIT) was unveiled by Vice President Al Gore.

Sam Myers (1112) and colleagues were mentioned in *Semiconductor International's* report on their "very unusual method by which metallic impurities in wafers may be reduced."

*Mechanical Engineering's* cover article on plasma coating leads off with details about metallurgist Mark Smith's (1841) work and includes a variety of quotes from him.

*this month in the past...*



Note: This column covers the month of November. We did not have room to print it in our only issue last month.

**40 years ago...** Five Sandia women with technical degrees and jobs were featured in a November 1953 LAB NEWS article. The article didn't say how many Sandia women worked in technical fields then, but they were certainly a rarity. The featured women were Miriam Ayer, Elzie Greene, Marian Hills, Dorothy Stimpson, and Mary Jo Tawser. Sandia's retiree records list only one of them: Elzie Greene, who retired in 1970. Does anyone know what became of the others? (Some of their last names may have changed because of marriages, etc.)

**20 years ago...** Sandia replaced the traditional one-hour lunch break with a 30-minute lunch period, primarily to encourage energy conservation. The new policy was begun to encourage "brown bagging" for lunch, thereby reducing lunch-time driving.

**Fun & Games**

**Chess** — Ron Kensek (9341) recently won the New Mexico Open Chess Tournament to become the 1993-94 New Mexico State Chess Champion. En route to his championship, Ron defeated two masters and drew a third.

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**Fun Run** — Join the "stampede" on Saturday, Dec. 4, to the Reindeer Roundup benefit fun run for Designs for Learning Differences (DLD) School. Races and competitive walk start at 10 a.m. and a one-mile walk begins at 10:15 at the DLD School at Heights Cumberland Presbyterian Church (8600 Academy NE, corner of Moon and Academy). Entry fee is \$15 and includes a T-shirt and race packet. Packets can be picked up at the school today, Dec. 3, 8 a.m.-6 p.m. Awards include 10K run, 5K run, and 5K race walk. DLD School is a school for children with learning disabilities. For more information, call 822-0476.



MODELING THE MERCHANDISE — Looking for inexpensive holiday gifts? Lisa Chavez, a student employee at the LAB NEWS, shows some Sandia logo items that are on sale inside Building 800 (in hallway, near the badge office) today only. Retired LAB NEWS editor John Shunny and a helper or two will be selling Sandia caps, mugs, T-shirts, and Swiss-Army-style knives there today from 9:30 a.m. to 5 p.m. Prices range from \$7 to \$10. All "profit" from the sale of these items goes to charitable causes. If any merchandise is left after today, employees can buy it at the LAB NEWS office in Mobile Office 172. At Sandia/California, the items are available at the Public Relations offices, Bldg. 911, Room 133. (Photo by Mark Poulsen)