Improving on the 'Rip-It-Apart' Method

Sensor Probes Forces between Surfaces at the Atomic Level

Why materials stick and why they come apart is a crucial issue in many aspects of engineering and design. How do solid surfaces stick together? What forces bind the interface between them?

Better answers to questions such as these may come from a Sandia-developed sensor that can measure the forces between two surfaces as they approach each other at atomic-level distances. It's called an interfacial force sensor.

The new sensor can detect a force as tiny as that required to pull two atoms apart — specifically, a millionth of a newton, enough to pull a sodium atom from its chlorine neighbor in sodium chloride (table salt). It can detect changes in separation of about 0.5 nanometer (one-half of one-billionth of a meter), about the diameter of a sodium atom.

"I wanted to watch the adhesive bond develop as two surfaces are brought together."

But it's not the ability to detect tiny forces that makes the sensor unique, says its developer, Jack Houston of Surface and Interface Science Dept. 1114. "I wanted to watch the adhesive bond develop as two surfaces are brought together, by measuring the force between them as they come into contact. The form of the force-vs.-separation curve is a fingerprint of the kind of bonding that's involved. Instruments already existed that could sense forces this small, but they couldn't measure the force all the way down to a surface."

Preventing the 'Snap'

Conventional sensors operate by gradually deflecting in response to an attractive force. But they suddenly "jump" or "snap" when the rate of change of the force reaches a certain point. It's like trying to bring two kitchen magnets together gradually, explains Jack. At some small separation, the magnetic attraction can't be resisted, and the magnets slap together. At the microscopic level, the same kind of instability makes it impossible for conventional sensors to measure the interfacial forces at separations any closer than where the "snap" occurs.

The Sandia sensor avoids the snapping prob-

(Continued on Page Four)

CLOSE EYE on an interfacial force sensor: The developer of the sensor, Jack Houston (1114), holds an example in forceps to display its relative size. (Photo by Randy Montoya)

LAB NEWS

VOL. 44, NO. 9 SANDIA NATIONAL LABORATORIES MAY 1, 1992

Still a 'Sure Thing'

Savings Bond Drive Starts May 11

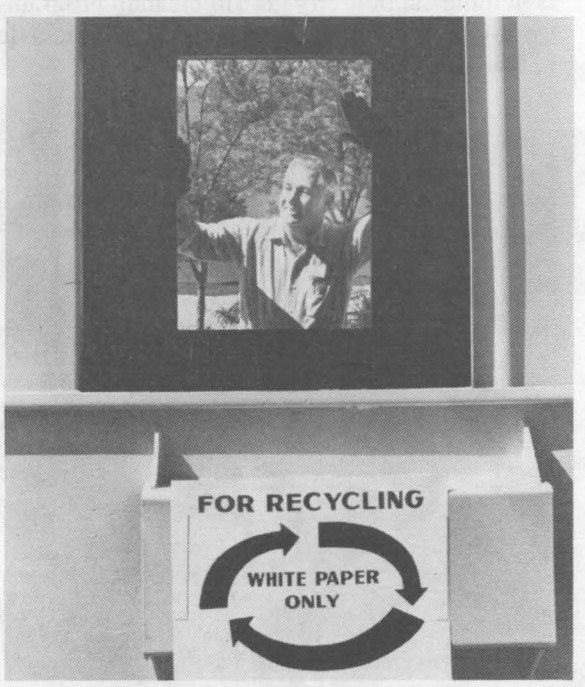
The stock market has been up for a while — think it'll stay there? It has occasionally looked a bit nervous in recent months.

If you don't like the stock market, there's always the old cash-under-the-mattress method. That pays zero interest, though — negative interest, if you count inflation and the possibility of a gnawing rodent.

Or maybe real estate. Lately, though, that's been something less than a sure thing.

And then there are US savings bonds. They pay a guaranteed minimum, and there's no ceiling on how high the market-based yields can go. Even if you like to put some of your investments into riskier places, there's always room in the portfolio

(Continued on Page Eight)



RECYCLING TIMES TWO — Jim Davis (3913), one of the original team members promoting paper recycling at Sandia, looks through a dumpster the group has "recycled" to collect paper. The recycling group recognized Jim, who's retiring soon, by planting a tree in his name, in honor of Earth Day (April 22). The dumpster is the first of several being refurbished. Painted bright green, they will replace the open-cage collection sites.

Hosted by Sandia

Computer Executives, DOE Researchers Meet in Precedent-Setting Conference

It was the first conference of its kind: Executives, chief technologists, and researchers from more than 30 of the largest computer manufacturers in the US gathered in Albuquerque with leaders and researchers from Sandia and four other DOE laboratories in mid-April to initiate and expand labs-industry collaborations.

The meeting opened the way for collaborative research between computer companies and the labs. The participants discussed research needs and opportunities in a range of technologies in high-performance computing, networking, packaging of microelectronics, semiconductor materials, and manufacturing.

"It was a great success," says Sudip Dosanjh of Program Development Office 1402 in Computational and Computer Sciences and Mathematics 1400, who organized the meeting in cooperation with the Computer Systems Policy Project (CSPP).

More than 30 US computer manufacturers gathered in Albuquerque with leaders from DOE labs.

CSPP is an affiliation of the chief executive officers of 12 major US computer companies — Apple, AT&T, Compaq, Control Data, Cray Research, Data General, Digital, Hewlett-Packard, IBM, Sun Microsystems, Tandem, and Unisys. All were represented, but the conference was open to other US companies as well. More than 20 non-CSPP-member companies participated.

Sandia hosted the two-day gathering, with President Al Narath officiating at the jam-packed opening plenary session April 15 at the Albuquerque Marriott. He introduced US Senators Pete Domenici, who gave the luncheon keynote address, and Jeff Bingaman, who spoke in the opening session. Both senators have actively supported legislation to encourage interactions between the DOE labs and US companies.

Catalyst for Interactions

Al called the meeting "a significant step in catalyzing important interactions" between the labs and industry. "We are pleased to be part of this effort."

Al's counterparts from four other DOE labs were there as well: Sig Hecker, Los Alamos; John Nuckolls, Lawrence Livermore; Al Trivelpiece, Oak Ridge; and Argonne Associate Laboratory Director Frank Fradin representing Director Alan Schriesheim.

"The goal of this meeting was to identify partnerships that will increase the economic competitiveness of US computer companies," says Sudip.

Industry representatives were positive. "This unprecedented meeting was a unique opportunity for industry to increase its awareness of research opportunities at the labs," says Sam Fuller, Vice President of Corporate Research and Architecture, Digital Equipment Corporation. "It helped establish relationships among critical personnel, which is essential to successful technology transfer from the labs to industry."

Dan Arvizu, Director of Technology Transfer and Industrial Relations Center 4200, represented DOE's laboratory coordinating board. In an overview talk, he set the stage for how

(Continued on Page Five)

This & That

Anonymous Thanks Anonymous – Every so often, we hear stories of kindness that are worth retelling. Here's one, in the words (edited for sake of brevity) of an Albuquerque Sandian who wishes to remain anonymous: "On March 30, I was on my way home when I had a bicycle accident on base. Two Sandians, one on a bicycle and one in a pickup, stopped to help. The man in the truck put my bike in his truck and took me to a Lovelace Urgent Care Center and waited until my wife arrived. Then he took my bike to my house. He told me his name, but I was in so much pain I forgot it. Emergency surgery that night repaired my shattered left elbow, and I am recovering well. Many thanks to the nameless Sandian who was so helpful."

* * *

Pen Pilferers, Repent! – Are you an inadvertent office pen thief? Do you take 'em home accidentally in your pocket or purse? I confess that I do (in pocket, not purse), and I'll bet many of you do, too. But I recognize my weakness and regularly do something about it. Every month or so, I examine my abode, toss the company pens into the briefcase, and bring 'em back to the office. Now that you know what an honest example I've set, I'll bet you'll want to join other Sandians next week (May 4-8), and participate in Pen Pilferers Penitence Week. I'm offering a prize (hint: you can write with it) to the Sandian at any site who brings in the most company-bought pens from home next week. If you bring in – let's say – 10 pens or more, have another Sandian certify the number and send a note with his/her name and your name to Employee Communications Dept. 3162. If you're the winner, we'll be in touch.

* * *

Fit Setting? – Sandia, Albuquerque's "Fitness Day," sponsored annually by the TLC (Total Life Concept) program, will be held at noon, Wednesday, May 13 at Hardin Field (Kirtland parade ground). See page seven for details. Speaking of Hardin Field, it has become an extremely popular place for noontime walkers and joggers since the Air Force installed the cinder track around the entire field several years ago. With an office just across the street, I frequently take noon walks there myself, but I may have to start wearing a cap when I do. That fierce New Mexico sun is turning my natural brown wavy locks into an unsightly gray.

* * *

No Gender Neutrality Then – While putting together a "This Month in the Past" column recently, I spotted this in a 1962 LAB NEWS story listing new books in the Sandia Tech Library: *The Intelligent Man's Guide to Science*, by the late Isaac Asimov. The title indicates that gender neutrality was perhaps the one area in which the prolific science and science-fiction writer wasn't ahead of his time. (Asimov died last month at age 72.) However, he later saw the light and revised the title of a new edition to *Asimov's Guide to Science*.

His original title reminded me that I had this title in my office bookcase: *Effective Communications for the Technical Man*, issued in 1972. Being a thoroughly modern man (Do I hear snickering?), I took my marking pen and changed the book spine; "Man" is now "Person."

* * *

LAB NEWS Quality Motto – In the current spirit of continuous improvement, I came up with a new LAB NEWS Quality motto (albeit with a bit of a veiled threat for employees in the department) to constantly remind us of the need for accuracy: "Proofreed everthing extreemly carefuly – you're job is at steak!" •LP

'Most Important' Visit

'Big Three' Automakers Visit Sandia Today

In an effort to increase cooperation among Sandia and the "Big Three" US automakers, a group of 12 executives and research engineers from Ford, GM, and Chrysler were scheduled to arrive at Sandia, Albuquerque yesterday, April 30, for a two-day, first-of-a-kind conference.

The visit is focusing on ways the major US automakers can benefit from Labs technical expertise and technologies, as well as ways they can cooperate on common problems. Sandia capabilities being discussed include metallurgy and materials research, massively parallel computing, and computer modeling as applied to design, safety, and manufacturing intelligent machines.

The automakers' primary concerns include finding ways to solve common manufacturing and design problems, including ways to reduce environmental impacts of building and operating automobiles. Dan Arvizu, Director of Technology Transfer and Industrial Relations 4200, says the meeting will give car makers an opportunity to view Labs capabilities first-hand.

"Al Narath calls this meeting one of the most important visits to Sandia this year," says Paul Robinson, VP for Laboratory Development 4000. "The meeting will build on the relationship already begun with GM at the conference in Detroit earlier this year [LAB NEWS, Feb. 7], and we're offering all three automakers opportunities to work with Sandia to help improve US economic competitiveness, both collaboratively and as part of individual proprietary R&D projects." •

The LAB NEWS will have more about this meeting in a future issue.

Take Note

The Keep Albuquerque Beautiful Graffiti Cleanup Program will receive 15 percent of the total amount of grocery receipts collected from now through June (with a limit of $4,500 going to the program). Receipts from any retail grocery store will be accepted. If you wish to participate, send your receipts to recycling coordinator Louise Bland (3917) before June 19. The contributions are from the Glad-Bag Company, which is helping support city graffiti cleanup programs throughout the country. (Glad-Bag products do not have to be purchased.)

LAB NEWS

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REMEMBERING WORKERS — Robert Kaneshiro (7818, ES&H Coordinator for the Metal Trades Council) holds a plaque honoring Americans killed or injured on the job. The plaque will be mounted near the entrance of Bldg. 800 to commemorate Workers Memorial Day, April 28. Others participating in the observance are, from left, Vicki Malone (3828, ES&H Coordinator for the Office and Professional Employees International Union), Ray Duran (3435, representative of the International Guards Union of America), Executive VP Orval Jones (20), Rick Arkin (DOE/Kirtland Area Office), Conrado Otero (2471, President of the Metal Trades Council), and Dick Lynch (Director of ES&H Program Management Center 7200).

Valuable Economic and Environmental Info

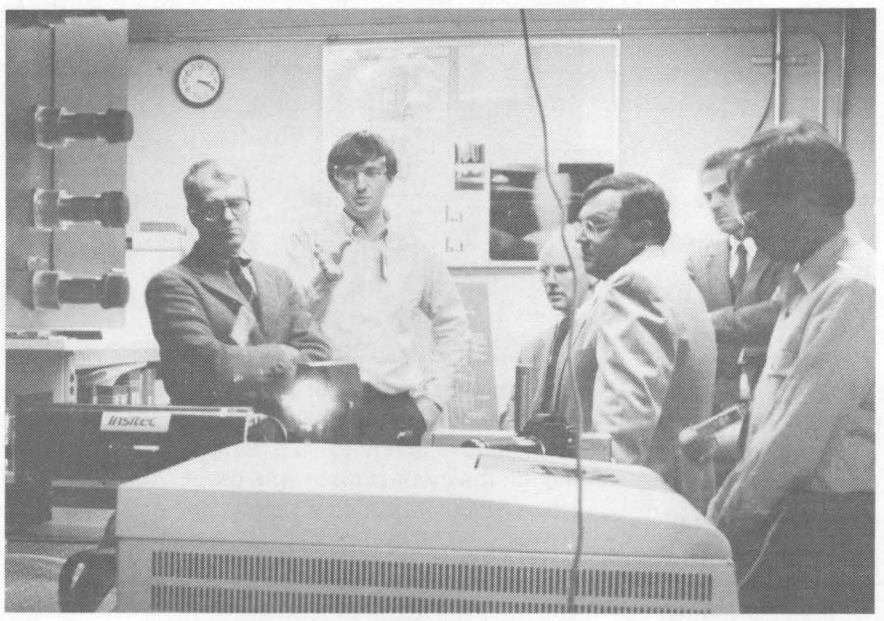
Computer Model Predicts Coal-Ash Formation

A computer model developed at Sandia, Livermore could help electric utilities design and operate more-efficient, cleaner-burning power plants. This capability is particularly valuable in light of federal Clean Air Act amendments lowering the amount of sulfur dioxide and nitrous oxide that power plants are allowed to emit.

The model, developed by Larry Baxter of Combustion Research Dept. 8361, gives a better prediction of the coal ash deposited in utility boilers than past techniques. The name of the model is ADLVIC — for "ash deposit, local viscosity, index of refraction, and composition."

ADLVIC has undergone commercial-scale testing to confirm the accuracy of its predictions. It is already being incorporated into the power cost model of at least one coal company.

"Using the model, power plant designers and operators are able to get a clearer picture of the combustion characteristics of a particular coal and make adjustments for those characteristics," says Larry.



LARRY BAXTER (8361, second from left) shows a multi-fuel combustor to congressional staff members during their recent visit to Sandia, Livermore. With Larry are (from left) Radford Byerly, Jr., chief of staff for the US House of Representatives Committee on Science, Space, and Technology; Peter Didisheim, deputy chief of staff; Francis Murray, staff director of the Energy Subcommittee; Bill McLean (8300); and Fred Tathwell, DOE host. The combustor was used to develop the computer model ADLVIC.

Hard Choices for Power Companies

By giving designers and operators more information about how different types of coal react in combustion, the model can help them decide whether a particular type of coal is economically feasible for a particular boiler. For instance, Larry explains, eastern and western coal each have characteristics that present economic and environmental dilemmas. Coal from the western US contains less sulfur, so it produces less sulfur dioxide when it burns. But the majority of the nation's generating plants are in the east, so eastern coal costs less to transport to the plants.

"The Clean Air Act amendments are likely to increase the cost of burning eastern coal by requiring additional costly air-scrubbing equipment," says Larry. "It's possible that plant operators will find western coal more economically attractive than in the past. They could use ADLVIC to help them make their decision."

However, western coal produces ash deposits that are harder to clean from equipment than eastern coal. Ash deposition is one of the most important factors influencing boiler design and operation. Commercial-scale tests of the new computer model have shown that it can help determine optimum operating conditions that will prevent unmanageable ash deposits from being formed by western coal.

Three-Week Burn Confirmed Predictions

The first commercial-scale test of ADLVIC was performed in a 600-megawatt boiler operated by Central Illinois Public Services (CIPS). A three-week test burn consumed about 72,000 tons of Wyoming coal. By analyzing the ash deposits, Larry and Richard DeSollar of CIPS confirmed the computer model's ability to predict ash deposit accumulation rate, removability, emissivity, and chemical composition.

Consolidation Coal Company (Consol) of Library, Pa., also worked with ADLVIC to predict ash deposit composition conditions corresponding to different regions of a utility boiler. Consol is incorporating ADLVIC into the company's in-house power cost model.

ADLVIC differs from other predictors of ash deposition in its sensitivity to coal type, boiler operating conditions, and location within a boiler. Other ash deposition predictors are based on the elemental properties of ash, but ADLVIC uses a mineralogical description of coal's inorganic matter. The model can predict changes in the mineral properties and the effect of the changes on ash deposition as particles flow through a boiler.

The model can help decide whether a particular type of coal is economically feasible for a particular boiler.

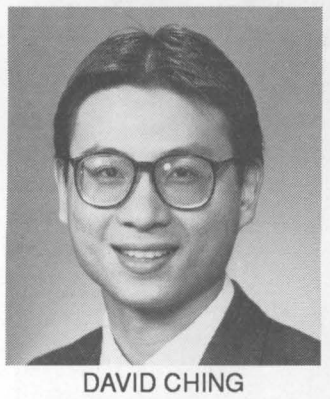
Larry and other Sandians are continuing to work with CIPS, Consol, and other utility and coal companies to demonstrate the uses of this research. They're also working to refine the model through additional utility-scale experiments with other types of coal and combustion facilities. The work on the ADLVIC model was done under the sponsorship of DOE's Office of Fossil Energy through the Pittsburgh Energy Technology Center's Coal Utilization Program. •

SANDIA LIVERMORE NEWS

Supervisory Appointments

DAVID CHING to Supervisor of Computer Operations Team 1951-1.

David joined Sandia at Livermore in 1986 as a senior technical aide in the Advanced Exploratory Systems Division to work on software engineering for the Strategic Defense Initiative program. He then moved to the W89/SRAM II Electrical System Division.



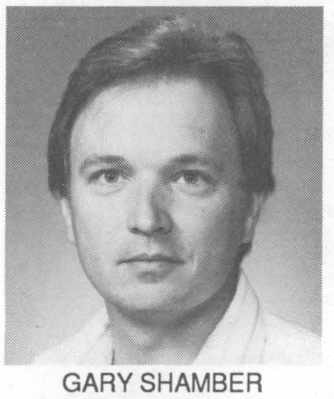
DAVID CHING

He has a BS in electronic engineering from DeVry Institute of Technology in Phoenix and a BS in computer science from California State University at Hayward. He is working toward an MS in computer science at UC Davis.

A native of Hawaii, David immigrated to Australia with his family in 1982. He then moved to Arizona for his schooling before joining Sandia. He is a member of IEEE and the Association for Computing Machinery. He lives in Grayson in Stanislaus County and enjoys tennis and the Asian strategy game "Go."

GARY SHAMBER to Manager of Facilities Operations Dept. 8615.

Gary joined Sandia at Albuquerque in June 1980 as an engineer in the Facilities Engineering organization. He transferred to Livermore in 1981 to the Plant Engineering Department, doing engineering design, construction management, and planning. In June 1987 he left Sandia to join the CIA in Washington as a mechanical engineer. He returned to Sandia, Livermore in 1989, once again working in Plant Engineering, where he has remained up to the present.



GARY SHAMBER

Gary has a BS in environmental engineering from California Polytechnic State University, San Luis Obispo, and an MS in mechanical engineering from UC Davis.

He and his wife Susan have three children and live in Lodi. Gary enjoys music, gardening, and golf.

Take Note

Paul Dominguez, Supervisor of Visitor Control and Administration Team 8531-1, has been named Business Associate of 1992 by the Livermore Valley Charter Chapter of the American Business Women's Association. Paul was honored for his leadership qualities, organizational abilities, and quick wit and personality. He was nominated by chapter president Karen Davis and Renee Haynes (both 8531). Paul received a plaque at the annual Business Associate Night meeting in Livermore.

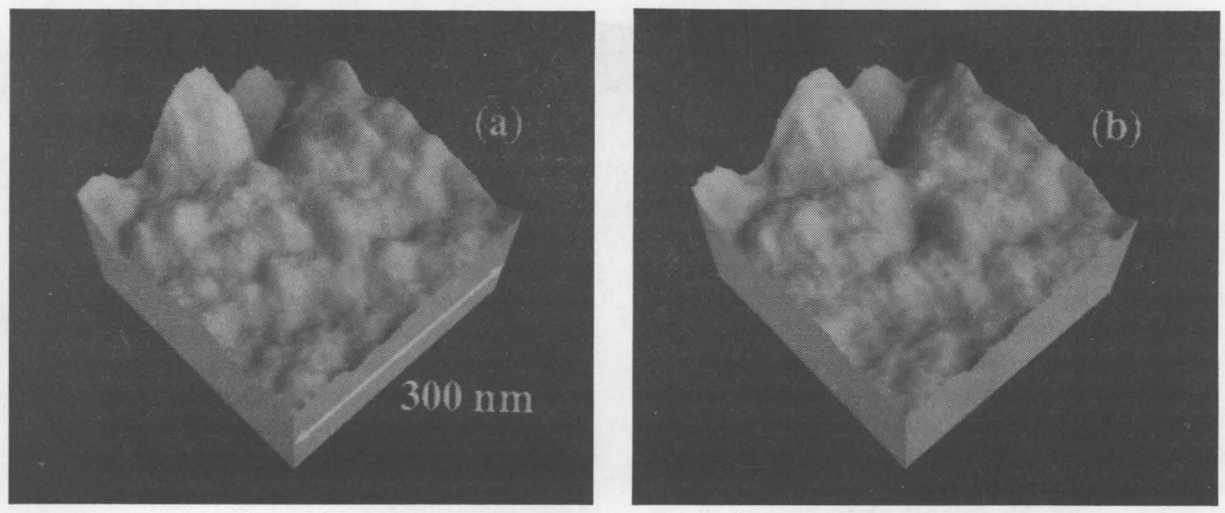
(Continued from Page One)

Force Sensor

lem by a self-balancing technique. The sensor is a capacitor plate supported by torsion bars like a teeter-totter, with a sharp tip on one end. Not only can the capacitor detect a force (the attraction or repulsion between two surfaces coming near each other), it can exert a force. An electronic feedback loop automatically applies a voltage that creates a counter force in the teeter-totter, keeping the capacitor in a fixed position and preventing the snap. Thus it's possible to make a continuous measurement of the interfacial force as the sensor tip and a flat surface come together.

Adhesion has conventionally been studied by forming an adhesive bond and then trying to pull it apart. What can be learned that way is limited, says Jack: "Adhesion is a long-studied field, but it involves interfaces that are still poorly characterized." The interfacial force sensor is the first attempt to study the binding between materials by watching adhesive bonds form as materials come into contact.

"This new capability for measuring interfacial forces will allow us to uncover the detailed mechanisms of adhesion and interfacial bonding," says Terry Michalske, Manager of Dept. 1114 and head of a new program to study interfacial forces. The interfacial force sensor is a key part of the program, which is supported by DOE's Basic Energy Sciences division.



GOLDEN HILLS — These images, made with an interfacial force microscope, are of the same gold surface, 300 nanometers (300 billionths of a meter) wide, on which individual grains of gold look like mountains. In the middle of image (b) is a "dimple" made by pushing on the surface with the interfacial force sensor. Even though the contact force was great enough to indent the surface, a lubricant on the gold (see "Microscope Helps Study of Lubricant") prevented any adhesion between the probe and the gold surface.

Besides studying fundamental properties of adhesion, the interfacial force sensor can also be used to look at microscopic features on a surface. When combined with an imaging system and a movable drive, the sensor becomes the heart of an interfacial force microscope that can be scanned across surfaces. Such a microscope can form three-dimensional images for the full range of interfacial forces — both attractive and repulsive.

In addition to the adhesive process itself, the sensor can be used to study other important phenomena such as fracture, friction, wear, lubrication, and the role of corrosion in attacking an adhesive bond.

Promising for Microcircuits

The sensor also has practical applications in detecting defects in microelectronics circuitry and studying how defects affect adhesion. In fact, says Jack, an AT&T Bell Labs group is already using the Sandia concept to look for microscopic defects in the lithographic masks used in integrated circuits.

Several companies have expressed interest in working with Sandia on projects involving the interfacial force sensor, says Terry. So far, DOE has provided funding to explore possible collaborations with two companies. Those companies have provided materials for Sandia researchers to study with an interfacial force microscope. If the preliminary investigations are promising, cooperative R&D agreements (CRADAs) can be set up for continuing collaboration.

●KFrazier(3161)/CS

Molecules Standing Like Wheat Stalks

Microscope Helps Study of Lubricant

In the first application of an interfacial force microscope using the new Sandia sensor, Labs scientists collaborated with Prof. Richard Crooks and graduate student Ross Thomas of the Department of Chemistry at the University of New Mexico. They studied the adhesive behavior between a tungsten tip, only a few hundred atoms in diameter, interacting with a gold surface covered by a one-molecule-thick layer of lubricant. Each molecule of the lubricant consists of a 16-carbon-atom hydrocarbon chain with a sulfur atom at one end. The sulfur atoms interact strongly with the gold surface, and the hydrocarbon chains stand virtually erect like equally spaced stalks of wheat.

The researchers found that the normally strong interaction between tungsten and gold — causing an unwanted "galling" effect when the two metals are in contact — is completely inactivated by the organic layer. Even if the layer is pushed down, there's no attractive interaction. This is an important insight into the lubricating effect.

They also found that when the lubricant molecules are crunched down — like stepping on wheat — they recover after only a second or so. This is the first such timing of the monolayer "self-assembly" process.

Welcome

Albuquerque — Dennis Henley (7825); *Other New Mexico* — Brenda Forget (7814), Joan Harris (7731), Dominick Vacca (3704).

Elsewhere: *Arizona* — Jonnie Banks (3161); *California* — Hans Papenguth (6344); *Virginia* — Richard Harding (6258).

Card of Thanks

In August 1991 I was diagnosed as having a rare form of bone cancer. A few weeks ago, after radiation and chemotherapy, I was informed by my physician that my cancer was terminal. I told a very special person, Cynthia Williams [152] my prognosis and that my daughter and I were planning a trip to San Antonio. Later she told me to hold off [making my reservations] for a while, because [my co-workers] were working on something. I've always known that I worked with a great group of people, but I was still surprised by the magnitude of their generosity. More than a thousand dollars was donated within a week. There were a lot of people involved, but specifically I'd like to thank the people in Benefits and the people in Department 100 who I am currently working with. Your kindness has meant so much to my daughter and me. Words cannot express my gratitude. Once again, from the bottom of my heart, thank you!

Kathy Mitchell (113)

DEEP-DOWN CLEANING — Members of a Stewart Bros. Drilling Co. crew sink pipe for what will be the evacuation well in a project to clean the chemical waste landfill in Sandia's Area 3. Jim Phelan of Environmental Technologies Dept. 6621 says other shafts drilled in the area will permit the introduction of electrodes that will heat the underground area, changing chemical wastes into gases that will be recovered by vacuuming them up through the evacuation well. Jim says preparation for the procedure will require six months to one year.

(Continued from Page One)

Computer Conference

companies can work with the labs, describing it as "industry-led, market-pull partnering."

The meeting came on the heels of a new DOE/CSPP model cooperative research and development agreement (CRADA). This was signed March 20 and announced by President Bush at the White House the same day. David Nelson, who heads DOE's high-performance computing activities, negotiated the model CRADA on behalf of DOE and took part in the Albuquerque meeting.

Model Is Starting Point

The model CRADA is intended to serve as a starting point for any US-based computer company to use in negotiating joint research projects with any DOE laboratory. It is the most industry-favorable CRADA signed by DOE and is expected to help bolster technology transfer from the labs to industry.

Senators Domenici and Bingaman are both longtime advocates of industry/lab cooperation and technology transfer. Domenici has called the CSPP/DOE model CRADA "a major milestone in our nation's efforts to realize the potential of technology transferred from the DOE laboratories to private industry."

US SENATOR Jeff Bingaman (right) spoke at the opening plenary session of a first-of-its-kind conference, hosted by Sandia, that involved high-level managers and researchers from US companies and five DOE labs. Talking with Sen. Bingaman during a break in the conference are (from left) Sam Fuller, Vice President of Corporate Research and Architecture at Digital Equipment Corporation; David Nelson, head of DOE's high-performance computing activities; and Dan Arvizu, Director of Technology Transfer and Industrial Relations 4200.

'Treasures of Science and Engineering'

In his keynote talk at the Albuquerque meeting, Domenici described the national labs as "treasures of science and engineering — flexible, powerful, intellectually strong" and said the challenge for DOE is to "use the science of the national labs to make our country more productive."

Domenici also praised the DOE labs for initiating new work on the human genome and said he hopes the labs will expand their computational efforts in this field. DOE's Nelson later said that he expects biology to be the fastest growing science of the future.

Bingaman said he saw the conference as an indication that the nation has not lost the flexibility and drive necessary to respond to new needs. He praised Sandia for helping make it happen.

People from many parts of Sandia contributed to the meeting, says Sudip, including organizations 1100, 1300, 1400, 1500, 1800, 1900, 2000, 4200, 6000 and 8000. •KFrazier(3161)

Sandia Researchers in Demand For One-to-One Discussions

Computer company researchers signed up for 66 one-on-one discussions with national labs researchers on the second day of the meeting to talk about specific projects. Twenty-five were about packaging; 22, computing; 10, manufacturing; and nine, materials.

Of those meetings, 32 were with Sandia researchers. "There's tremendous interest in what Sandia is doing, both in high-performance computing and in microelectronics — and specifically in packaging of microelectronics," says Sudip Dosanjh (1402).

Of special interest to the companies, he says, was Sandia's environmentally conscious manufacturing program. "The companies want to work together to satisfy environmental regulations."

Couldn't Have Been Done Without Electronic Mail

Organizing the DOE/CSPP meeting was a challenge in itself. Sudip Dosanjh of Program Development Office 1402 says the first discussions with CSPP weren't until late January. The labs then prepared white papers that were distributed electronically to the computer companies to learn their strongest interests. The meeting and the agenda were then all put together in the last month.

"Everything was done by electronic mail," says Sudip. "The whole meeting was a testimonial to e-mail. I don't think that we could have organized, in such a short time, a meeting involving so many companies and five labs if we hadn't been able to send e-mail back and forth. None of the computer companies mailed anything by traditional mail. All the planning and organizing took place electronically. No one had to play telephone tag, and we got replies back fast. It's a preview of how Sandia will interact with the outside world in the future."

No Pay, Just Experience

German Grad Students Wind Up Two-Month Stay at Sandia

You might wonder about someone who will not only work for no wages, but finance his own lengthy trip to get to the job, then support himself while he's working.

But four graduate engineering students from the Technical University of Munich were so impressed with Sandia's capabilities that they did just that. At the end of their two-month stay, everyone involved in the arrangement agreed it was beneficial to both them and the Labs.

The four students — Erwin Löhnert, Bernd Maile, Herbert Negele, and Jurgen Srnik — wrote last fall, asking for an opportunity to work at the Shock Thermodynamics Applied Research (STAR) Facility in order to gain practical experience in shock physics experimental methods.

Their request went to Experimental Impact Physics Dept. 1433, which, after investigation, agreed to host them. Phil Stanton (1433 Manager) says they were assigned to work under the direction of Jim Ang (1430A).

"It was a distinct pleasure to host these young men," Phil says. "Each made a significant contribution to the projects to which he was assigned. They also learned about our operations, about the physics issues we address, and the experimental techniques used to address them."

He says they helped with development of measurement techniques for hypervelocity impact phenomena. The techniques they used included pulsed laser holography and impact flash spectroscopy, which are still in their infancy, he says.

The four students' assignment began March 2 and ended April 30.

Phil says they provided their own financial support and Sandia provided them with working materials and safety-related materials and training. •

CHECKING RESULTS — Herbert Negele (left) and Jurgen Srnik examine results after fragments from a hypervelocity impact struck a piece of metal. They and two fellow Technical University of Munich graduate engineering students performed experimental work during a two-month stay at Sandia.

Profiles of Sandia's New Center Directors

The LAB NEWS continues profiling Sandia's new directors in this issue. Some were profiled in preceding issues.

MELISSA MURPHY to Director of Laboratory Information Systems Center 3800.

"Information is a corporate asset that should be available to those who need it to effectively perform their jobs," says Melissa. "We intend to work closely with Org. 4400 and the other information systems organizations to provide timely, accurate corporate information to Sandians at their desktops. These computer-based systems will provide information in a form that is defined by the end users."


MELISSA MURPHY

Melissa joined Sandia's Adversary Analysis Division in 1983 and analyzed use control software. She joined the Advanced Electrical Systems Division in 1984 and developed software engineering techniques for command and control product applications. In 1986, she transferred to the Digital Subsystems Software Division, where she was project leader for the development of the Crypto Algorithm Message Processor (CAMP), a command and control subsystem for Pantex.

Melissa was promoted to Supervisor of the Digital Subsystems Software Division in 1988. Her work there included analysis, definition, and development of PAL (permissive action link) ground support equipment.

In 1990, she was promoted to Manager of the Design and Product Support Department, which provides software services to engineering customers in Computer-Aided Engineering, networks, information systems, and advanced manufacturing.

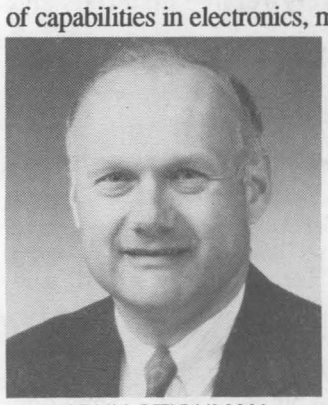
Melissa's degrees, all from NMSU, include a BS in computer science and mathematics and an MS and a PhD in computer science. She's a member of IEEE and the Association for Computing Machinery. In 1991, she was appointed to the IEEE Software Industrial Advisory Board.

She enjoys soccer and fishing. She and her husband Michael (2346) live in the NE Heights. They have three grown daughters.

* * *

JOHN STICHMAN to Director of Surety Components and Instrumentation Center 2600.

"This new center brings together a broad range of capabilities in electronics, mechanical engineering, and software engineering," says John. "In addition to our current programs in surety component and instrumentation development, the staff and I will be seeking new ways to apply these capabilities."


JOHN STICHMAN

John joined the Labs in 1972 as a member of the Fire Set Division, where he designed and analyzed fire sets for nuclear weapons. He worked on developing the Integrated Fire Set for integrating safing and arming functions.

In 1978, he was promoted to Supervisor of the Advanced Firing Subsystems Division. He transferred to the Command and Control Subsystems Division in 1981 and developed field equipment for PAL code management using electronic encryption techniques.

He was promoted in 1987 to Manager of Electronic Subsystems Department II, where he developed electronic subsystems for nuclear weapons, guidance and control subsystems (SANDAC computer and inertial measurement units), and high-speed signal processors for automatic target recognition.

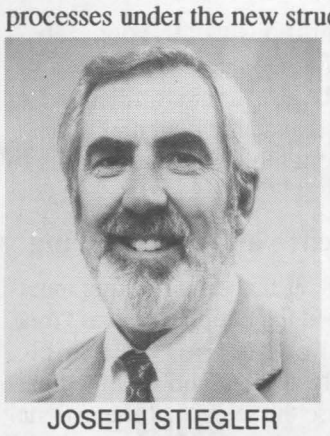
John has a BS, an MS, and a PhD in electrical engineering, all from the University of Wisconsin. He worked for Hughes Aircraft Company before joining Sandia. He is a member of IEEE and is a Registered Professional Engineer in New Mexico.

John enjoys church activities, tennis, wine making, and gardening. He and his wife Kris have three children and live in the NE Heights.

* * *

JOSEPH STIEGLER to Director of ES&H Center 7700.

"I'm looking forward to working with the staff of the ES&H Center as we develop novel work processes under the new structure and strive to improve ES&H services to our customers," says Joe.


JOSEPH STIEGLER

Joe joined Sandia, Livermore's Field Test Division in 1959 and did telemetry design and testing. He was promoted to Supervisor of the Field Test Section in 1963. He participated in Operation Dominic and in the readiness program. He joined the Albuquerque Field Test Division in 1964 and was promoted in 1965 to Supervisor of the Systems Engineering and Coordination Division in the Nuclear Test Department.

In 1969, Joe was promoted to Manager of the Instrumentation Applications Department. His work included Safeguard and Security research and development from 1974 until 1981, when he became Congressional Liaison in the Management Staff Organization. He joined the Facilities Engineering Department in 1983 and transferred to Nuclear Materials Transportation Department in 1985. He's been involved with the ES&H organization since 1990 and helped develop and implement a program to prepare for the 1991 DOE Tiger Team Assessment.

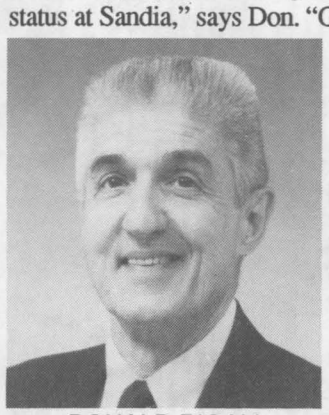
Joe has a BS in electrical engineering from the University of Washington. He is a member of the ANSI-N14 Management Committee. Before joining the Labs, he worked for Pacific Engineers in Seattle. He served with the Coast Guard from 1951 to 1959.

He enjoys photography, reading, and fishing. Joe and his wife Diana have four children and live in NE Albuquerque.

* * *

DONALD RIGALI to Director of Hypersonics and Threat Technology Center 9800.

"I was pleased to see our work on hypersonics and reentry systems recognized as meriting center status at Sandia," says Don. "Our center will continue this type of exciting, high-risk, high-technology flight testing and hopefully expand into other types of space and flight proof-of-principle demonstrations."


DONALD RIGALI

Don joined Sandia in 1957 as a wind tunnel test engineer in the Experimental Aerodynamics Division. He transferred to the Aerospace Projects Division in 1962 and participated in Operation Dominic. His work included high-altitude sounding rocket research and development and high-speed rocket sled testing.

In 1969, he joined the Exploratory Systems Division, where he worked on reentry vehicle systems. In 1972, he was promoted to Supervisor of the Exploratory Systems Division and was responsible for the development and proof-of-principle flight tests of carbon/carbon reentry vehicles and reentry vehicle and high-speed vehicle research and development, including reimbursable programs for the Strategic Defense Initiative Organization, the Air Force Ballistic Missile Organization and Space Division, the Navy, the Army, the Defense Advanced Research Projects Agency, and NASA.

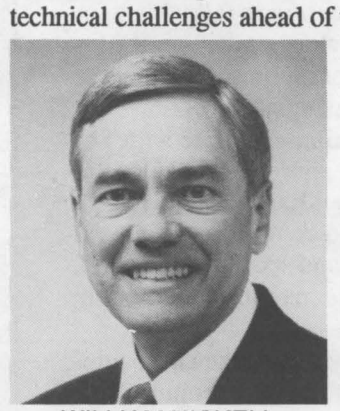
Don has a BA in liberal arts from the College of St. Thomas, a BS in aeronautical engineering from the University of Notre Dame, and an MS in mechanical engineering from UNM. He is a member of the American Institute of Aeronautics and Astronautics.

Don is involved in community activities that include working with his wife Barbara in two marriage support groups, Marriage Encounter and Retrouvaille. He and Barbara also enjoy spending time in the southern Colorado mountains. They have four grown children and live in the NE Heights.

* * *

WILLIAM NICKELL to Director of New Mexico Weapon Development Center 5100.

"I'm looking forward to the very interesting technical challenges ahead of us," says Bill, "developing new ideas and designs for the stockpile of the future — meeting the challenges of longer life, even greater safety, greater use control, greater reliability, and lower cost. Other emphases will include designing for manufacturing with more environmentally sound materials and processes, higher yields, and lower cost; dismantling and disposing of the returning stockpile under more stringent environmental disposal rules than those existing when they were designed or manufactured; developing a broader reimbursable program; supporting the military in development of new targeting strategies and fuzing algorithms; and developing new ways of doing business more efficiently and effectively."


WILLIAM NICKELL

Bill joined the Labs in 1965 as a member of the QEST Tester Development Division, where he developed digital instrumentation systems for stockpile evaluation and underground testing. He worked in the Weapon Systems Phase 1 and 2 Division designing weapon systems for Safeguard ABM programs. He then joined the Nuclear Reactor Safety Division, where he helped establish new missions in nuclear reactor safety.

He was promoted to Supervisor of the W81 Development Division in 1979 and worked on the warhead for the Navy's Standard Missile. Other divisions he's headed include the Peacekeeper Fuze Development Division and the W88/Mk 5 Arming, Fuzing, and Firing Division. In 1989, Bill was promoted to Manager of the Telemetry Development Department and led development of instrumentation systems for nuclear weapons and reimbursable programs. He was a member of the Pre-Tiger Team Self Assessment group and the Line Manager ES&H Action Team that prepared for the DOE Tiger Team visit.

Bill has a BS in electrical engineering from UNM. During an Air Force tour at the National Security Agency, he completed the Catholic University of America's master's study program. Before coming to the Labs, he worked for Philco-Ford Computer Division, Packard Bell

Computer, and Ford Motor Company. He is a member of Sigma Xi.

Bill enjoys golf, computers, and photography. He and his wife Carole have four children and live in SE Albuquerque.

* * *

EDWARD GRAHAM, JR. to Director of Facilities Operations and Maintenance Center 7800.

Ed joined Sandia in 1964 as a member of the Technical Development Program. He worked with an electromagnetic fields group, making field strength measurements. In 1970, he joined the Semiconductor Devices Division and performed radiation effects studies on small signal and microwave transistors. He transferred to the IC Design Division in 1975 and provided development and production support for several major weapon systems.

EDWARD GRAHAM

He was promoted to Supervisor of the Bipolar IC Design and RF Semiconductors Division in 1976 and directed activities in design and development of custom dielectrically isolated, radiation-hardened integrated circuits, gate arrays, and high-speed integrated circuits. From 1980 to 1981, he supervised the Bipolar Circuits and Microwave Semiconductor Devices Division, which included the IC Test Facility and Microelectronics Data Acquisition System. The division was reorganized in 1981. Ed's group worked to develop high reliability semiconductors for MX and Trident II systems. In 1982, he transferred to the CRM Programs Division, where he was liaison officer for Sandia's Center for Radiation-Hardened Microelectronics.

Ed was promoted to Manager of the Customer Interface/Product Engineering Department in 1986 and was responsible for program management and customer development, product engineering of CRM-provided integrated circuits, and development of certain externally procured semiconductors. From 1987 to 1990, he managed the Commercial Products Department, responsible for product engineering for procured semiconductors at Sandia, and supervised the Radiation Effects in Microelectronics Division.

In August 1990, Ed went on Special Assignment to the ES&H Implementation Project and led the effort in the Pre-Tiger Team Self-Assessment of Sandia's compliance with existing ES&H requirements. Beginning in March 1991, he was on special assignment reporting to the Vice President for ES&H Improvement and Compliance. He headed the ES&H Project Management Office and led a team that developed, negotiated, and published an Action Plan in response to the DOE Tiger Team visit.

Ed's degrees are in electrical engineering — a BS from Mississippi State University, an MS from UNM, and a PhD from North Carolina State University. He is a former chairman of the Albuquerque Section of IEEE. He is currently treasurer of the Government Microelectronics Applications Conference Steering Committee.

Ed enjoys skiing, amateur radio, and collecting books about the Civil War. He has one grown child. Ed and his wife Sandra Barnes (3522) live in the NE Heights. •JC

Sandia News Briefs

Sandia, Shell Agree to Pursue Catalyst Research

Sandia and Shell Development Company, a division of Shell Oil, have signed a two-year, $1.2 million cooperative research and development agreement designed to produce a catalyst that would reduce waste generated in certain petrochemical processes. The effort will focus on oxidized hydrocarbons — used in the formulation of plastics and other materials — whose production generates undesired by-products. Both partners will concentrate on hydrous metal oxides, with the goal of improving present reaction rates, creating more product for a given amount of energy, and minimizing waste and other by-products. Bob Dosch, Linda McLaughlin, Steve Lott, and Jim Miller of Process Research Dept. 6212 will lead Sandia's research, and the Labs' portion of the project's funding will come from DOE's Industrial Waste Reduction Program, through Environmentally Conscious Manufacturing Programs Dept. 6611.

Reconfiguration Environmental Impact Statement Plan Available

Sandians interested in examining a copy of the Implementation Plan for the Nuclear Weapons Complex Reconfiguration Programmatic Environmental Impact Statement can do so in any of several DOE Public Reading Rooms. The plan provides guidance for preparing the environmental impact statement. It also describes a range of alternatives for addressing siting and technology issues related to plutonium functions, tritium supply, uranium functions, assembly and disassembly functions, and research, development, and testing functions performed by the weapons complex. The impact statement analyzes weapons complex functions now conducted at Sandia, the other weapon labs, and several test and production facilities.

Additional information is available from these and other DOE field offices: Albuquerque (505) 845-5163; Oakland, (415) 273-4428; Las Vegas, (702) 295-1274.

New Information Line for Businesses Interested in Labs Technology

Immediate information about services offered by Sandia's Technology-Based Regional Economic Development (TRED) program is now available to small and medium-sized businesses. Callers can talk to TRED field agents and request information about technical workshops, partnership agreements, Sandia tours, and other subjects. Agents will answer questions and telefax or mail additional information to callers when needed. The TRED program was created to satisfy specialized technology transfer needs of small businesses, and is part of the Labs' expanded tech transfer initiative provided for under the National Competitiveness Technology Transfer Act of 1989. The number for the TRED automated information line is (505) 845-TRED (845-8733). Callers need a touchtone phone to use the system.

Blackwell Chairs Steering Committee for National Initiative Group

Arlyn Blackwell, Director of Engineering Design 2800, has been elected chairman of the steering committee of the National Initiative for Product Data Exchange. Several leading US industrial firms have joined in this initiative with the Departments of Defense, Commerce, and Energy to establish a group to accelerate the definition and realization of required standards that will encourage "agile manufacturing." The group envisions that monolithic, mass production firms from the past will be replaced by "virtual companies" — ad hoc consortia of industrial firms formed to develop new technology and products quickly and efficiently.

Arlyn says the DOE Nuclear Weapon Complex reconfiguration program and several technical projects at Sandia may fit into the effort well.

Send potential Sandia News Briefs to Editor, Dept. 3162.

Work Out Where You Work

Fitness Day '92 Is Wednesday, May 13

Albuquerque Sandians may find that the road to physical fitness begins at Hardin Field (KAFB parade ground) at noon on Wednesday, May 13. That's the place and time for the 12th annual Fitness Day activities, with the theme "Work Out Where You Work." Sponsored by the Labs' TLC (Total Life Concept) Program, the activities continue until 1 p.m.

It's hard to get fit by just watching, so TLC representative Michaeli Portman (3330) encourages Sandians to participate in one of five mini-classes that will begin at 12:15. The classes, led by TLC instructors, include step aerobics, low-impact aerobics, stretching, walking/jogging, and body sculpting. A second session of each class will be held at 12:40, so particularly energetic folks can participate in two different classes.

Other features and activities include a TLC information booth, several raffles for recreation and fitness items, a catered lunch, music (begins at 11:45), other entertainment, and some health, sports, and fitness vendors demonstrating exercise equipment and clothing.

Get an Early Start

The first raffle, at 12:10, is for Sandians who sign a pledge to exercise for at least 20 minutes on May 13. Employees can get raffle tickets by signing up before work that day, beginning at 7:30 a.m., at one of four locations (Gates 4 and 6, the Bldg. 800 lobby, and the Technology Transfer Center). Employees participating in the mini-classes will receive tickets for raffles that will take place after the classes.

Lunch will be catered by the Marriott at Hardin Field. Chicken sandwiches, two side dishes, and a cold drink cost $4. Substitute a hamburger (with lean meat, of course) for the chicken sandwich and the cost is $3.

Sandia's Fitness Day coincides with National Employee Health and Fitness Day, which promotes regular physical activity as part of the corporate culture in America. In case of rain, the event will be postponed until May 20.

Michaeli says Sandia's TLC Program sponsors Fitness Day as one way of encouraging employees to exercise regularly. "Folks who are able to exercise regularly not only feel and look better, but generally are more productive and satisfied with their jobs and have fewer work absences and lower health care costs," she notes. •

LOOKING FOR A LOST CONTACT LENS? Nope, it's a group of Sandians participating in last year's Fitness Day stretching class. Energetic exercisers will get together at noon on May 13 for this year's Fitness Day festivities (see story).

PICK A BOND — Although Margaret Chu (6622), a division representative for the 1992 Savings Bond Drive, is displaying only one denomination of bonds, Sandians can sign up to receive any of a number of denominations by payroll deduction. The 1992 Bond Drive is May 11 through 29.

(Continued from Page One)

Bond Drive

for a safe investment that provides a good yield.

"Probably no other investment offers the combination of yield, safety, and tax advantages that US savings bonds do," says Chris Olson (4504), chairman of the 1992 Savings Bond Committee.

Coming up soon will be the perfect opportunity to start investing in bonds, or to increase your current investment. This year's US Savings Bond Drive starts May 11 and continues through May 29.

Defer Taxes on Interest

The tax advantage of US Series EE bonds is that the interest income can be federal-tax-deferred until they're cashed, and there's no state tax at all on the interest. Stockpiling bonds for retirement can be an especially smart move. "If you defer the interest and cash the bonds after retirement," says Chris, "you'll probably be paying a lower tax rate on the interest." Many retirees find an advantage in being able to convert Series EE bonds to Series HH bonds and receive semiannual interest checks from the HH bonds. That way, interest on the rolled-over EE bonds is still deferred, though tax is owed on the HH interest.

What about folks just starting a family? Bonds have long been a cornerstone of college funds, and now they're even better for that purpose. Since 1990, it has been possible to avoid paying any income tax on the interest, if a bond purchased after Dec. 31, 1989, is used for educational expenses of the taxpayer, the taxpayer's spouse, or the taxpayer's dependent. Some important terms and conditions, as well as income limits, apply to this tax exemption, and bond-buyers planning to use bonds for an education fund should make sure they understand these.

Interest rates for bonds are set each October and May. Currently, they're guaranteed to provide an annual return of 6 percent, or 85 percent of the average market rates on five-year US Treasury securities, whichever is *greater*. As a result, any bond bought now and held for at least five years will pay a floating interest rate that can't go below the minimum. (Bonds held less than five years pay a rate depending on the length of time since purchase.) The most recent rate is 6.38 percent (an updated rate is to be announced today, May 1).

Challenge from US West

If these attractions aren't quite enough to interest you, Chris has one more inducement for the competitive-minded. "US West has challenged Sandia to see which company has the higher rate of participation this year. Last year, they were just a percentage point or so below us. Their bond committee has let me know that if we're going to come out on top again this time, we'll have to make a real effort."

During the 1991 drive, about 96 percent of Sandians signed up to buy bonds. Chris says that Sandia's participation percentages in the past have put the Labs near the top for companies of similar size.

As in previous years, the 1992 Savings Bond Drive will be conducted by division representatives (formerly called vice-presidency representatives), with the help of coordinators and canvassers in each center. Every employee will receive a payroll deduction card to enroll in the bond program or to change basic allotments, beneficiaries, or denomination amounts. The cards should be returned to the canvassers, even if no changes are requested.

"Naturally the Bond Committee members, division representatives, and other volunteers encourage Sandians who are already buying bonds to continue doing so," says Chris. "And we hope that others will join the program. We also hope that everybody will take a look at his or her level of support and increase the basic allotment. As a bonus, Sandia management has offered to spring for a pizza party for the department that achieves the largest percentage increase in the amount allotted for payroll deduction purchases of bonds." •CS

Allotments and Denominations

Bonds purchased by payroll deduction may be received in face amounts from $100 to $10,000 (bonds are bought at half their face value). Employees who were already purchasing smaller denominations — $50 or $75 — before February 1988 may continue to receive those denominations.

Deductions may be as little as $1 a week for weekly paid employees and $2 each paycheck for semimonthly paid. The deductions accumulate until there's enough to buy a bond at the denomination that the employee signed up for.

Folks who participate in the Bond-a-Year Plan (one annual payment) may purchase any denomination, including the smaller ones.

Presenting the People Who Help You Invest in Bonds

It takes a lot of cooperation to get bond-drive information and payroll deduction cards to and from each employee. At the heart of the process, says 1992 Bond Drive chairman Chris Olson (4504), are the division representatives. They make sure that each center in their division has a representative and that the drive generally goes smoothly.

The 1992 division representatives are Ray Shaum (113), Robert Thomas (1562), Peter Winokur (1332), Sam Martin (2541), Larry McCartney (2722), Joanne Romero (4302), Dick Pettit (4342), Pat Sena (5122), Cathy Hiebert-Dodd (5024), Marion Scott (6258), Margaret Chu (6622), Wayne Burton (7845), Geri Saucier (7700), Don Wright (8541), Carolyn Pura (5356), Bonnie Apodaca (9210), and Frank Crutcher (9216).

Other 1992 Bond Drive Committee members are Rita Shortman (152), Dorothy Rarick (3125), and Charles Shirley (3162).

Organizational Safety Meetings Mandatory

Sandia's Tiger Team Action Plan has been approved by DOE, and safety engineers are reminding everyone that the plan requires each Labs organization to hold a safety meeting at least every six months — more often for those whose operations involve greater-than-common hazards.

These meetings provide an opportunity for presentation of the mandatory ES&H training required for all employees in the areas of employee rights, fire extinguisher use, radiation, and lock-out-tagout awareness, says Al Fine, Manager of Safety Engineering Dept. II 7333.

Other safety meeting topics, he says, could include presentations by ES&H coordinators, discussions of accidents or near-misses within organizations, and discussions of safe operating procedures (SOPs) and preliminary hazards analyses (PHAs).

"Training tapes from the Safety Engineering tape library are available for meetings like these, not only for safety meetings, but for any appropriate purpose," Al says. "Also, Safety Engineering organizational representatives are available for consultation about safety meetings, and can suggest topics of interest for meetings."

Because of changes made during the recent restructuring, an updated list of Safety Engineering organizational representatives is being prepared and can be sent to any organization requesting it, he says.

Reporting of safety meeting minutes and inspections, for both office and lab space, remains a requirement, Al says. Reports must include a list of attendees and plans for makeup for members of the organization not present, and must be sent to Safety Engineering. He says even if an organization has a safety meeting more often, it is still required to report to Safety Engineering only once during each six-month period.

Al says new inspection forms are being designed and will be distributed as soon as they are available.

"The important thing to remember," he says, "is that the Tiger Team Action Plan requires us [7333] to report organizations that are delinquent in holding safety meetings to their appropriate management level, so to avoid being delinquent, schedule meetings on time." •

Earnings Factors January 1992

Long-Term Savings Plan for Management Employees (LTSPME)	Earnings Factors
AT&T Shares	.9523
Government Obligations	.9967
Equity Portfolio	.9917
Guaranteed Interest Fund	1.0068
South Africa Restricted Fund	.9861

Long-Term Savings and Security Plan (LTSSP)	
AT&T Shares	.9525
Guaranteed Interest Fund	1.0069
South Africa Restricted Fund	.9860
Equity Portfolio	.9917
Employer Stock Fund	.9512

Fun & Games

Golf — The Sandia Golf Association (SGA) recently held two tournaments. Winners of the SGA Rail Classic held April 4 at the Tierra del Sol Country Club in Belen were: A Flight — First place: Pres Herrington (9236) and Charles Salazar (2482); second place: David Salas (ret.) and William Lutgen (2853); third place: Daryle Dew and Bob Platt; fourth place: Gary Schuster (2531) and Paul Royer (2531). B Flight — First place: Richard Anderson (2482) and Robert Walsh (2482); second place: Stephen Baca (2833) and Julian Lovato (35); third place: Donald Robbins (2814) and Howard Cilke (2331); fourth place: John Jojola (1242) and Richard Precit (2535) tied with Al Maes (3716) and Manny Chavez.

SGA winners of the Cochiti Classic Tournament held April 11 at the Cochiti Golf Course were: First place — Manny Chavez and Al Maes (3716); second place (three-way tie) — Roy Tucker (6215) and Tom Welch (9242), Tom Bomber (4112) and Dave Keller (DOE), and Gene Marquez (3442) and Ken Ronquillo (4313); fifth place — John Garcia (6423) and Jose Torrez (1277).

* * *

Bowling — SANDOE Bowling Association February Bowlers-of-the-Month include: Scratch — Ron van Theemsche (2851), 714; and Diana Dobias (6301), 527; Handicap — Gary Laughlin (2543), 531 and 675; and Lea Long, 515 and 647.

Winners of the No-Tap/Scotch Doubles Tournament held March 14 and 15 at Kirtland Lanes were Vic (DOE/AL) and Mary Berniklau with a 1,579 combined handicap series. Second place went to Joe Lombardo and Glenn Perkal with a 1,547 combined handicap series.

Take Note

The ISE (Ideas in Science and Electronics) 1992 Symposium will be held May 12 through 14 at the Albuquerque Convention Center. Products and services of more than 1,400 companies will be presented in exhibits, technical seminars, and tutorials. Symposium hours are 9 a.m. to 5 p.m. Tuesday, 9 a.m. to 7 p.m. Wednesday, and 9 a.m. to 4 p.m Thursday. Shuttle bus service will be available from KAFB to the Convention Center; see next Monday's *Weekly Bulletin* for a schedule. For information, call 262-1023.

* * *

Sandia Laboratory Federal Credit Union is offering Wills and Estate Planning seminars in May at the Oddfellows Hall (2613 Texas NE, 1 block north of Menaul): Wills & Estate Planning for Small Estates (less than $600,000) — Monday, May 4, 6:30 to 8:30 p.m. and Saturday, May 16, 10 a.m. to noon; Estate Planning for Senior Citizens (Powers of Attorney, Right-to-Die, Medicaid Planning) — Saturday, May 9, 10 a.m. to noon; and Wills & Estate Planning for Large Estates (more than $600,000) — Monday, May 11, 6:30 to 8:30 p.m. Call 293-0500, ext. 303, for reservations.

Retiree Deaths

Charles Bates (66)	March 7
Sarah Gipson (76)	March 7
Chadwick Miller (76)	March 8
Ruth Batchelor (84)	March 12
Virginia Smeltzer (86)	March 15
William Olheiser (80)	March 16
Walter Suiter (73)	March 18
Norman Mozley (72)	March 22
John Wheeler (67)	March 27
Ruth Way (69)	March 29
Charley Bates (67)	March 28
Frank Norris (73)	March 31

Feedback

Q: There seems to be a big problem getting fluorescent light tubes replaced. On Oct. 25 of last year, a Maintenance Service Request was submitted for repair or replacement of emergency lighting. Three months later, it still has not been done. I can understand an ordinary light fixture taking a lower priority, but if the lights go out in the south end of Bldg. 894, many rooms will be totally in the dark. This seems to be a potential safety problem. Currently, emergency lights are out in rooms 150, 152, 155, 156, 157, 158, and the men's rest room. We have been assured during several phone calls that the lighting would be fixed, but there seems to be a shortage of employees to do it. How is Sandia going to get a quality award when we can't even keep the lights on?

A: Maintenance planning procedures require that all emergency light fixture relamping requests be assigned a high priority. The Maintenance Service Request to repair the emergency lighting in Bldg. 894 was mistakenly entered in the Automated Maintenance Management System as a low priority. This has been corrected, and the Bldg. 894 light fixtures have been relamped. I apologize for the delay and thank you for your concern.

Jim Jacobs (7100)

Q: Why is there not a family planning organization on the list of those receiving money from Sandia's Employee Contribution Plan (ECP)? I have been a faithful contributor to ECP since coming to work here. I know the money is spent on worthy causes, but only in the last year did I take a careful look at the list of receiving organizations. At this year's ECP meeting, we were told that the needs of the community are carefully evaluated by a committee and the money is distributed where the needs are most acute.

In recent years, there have been continued cutbacks in government funding for contraception for low-income individuals. America has the highest rate of unintended teenage pregnancy in the industrialized world; New Mexico's rate is higher than the national average. According to Planned Parenthood's 1991 Special Report, more than 1 million American teenagers become pregnant every year, 80 percent unintentionally. These young parents end up requiring other, more expensive services from government and from organizations funded by United Way.

I am reluctant to exercise my donor option to assign money to an organization because United Way gets a sizable fraction of my donation for administrative purposes.

Some employees may consider family planning to be controversial or birth control to be immoral. But does that mean we should forget the need? If so, Sandia should shut down operations so as not to offend people who are morally opposed to nuclear weapons.

A: Thanks for your support and interest in ECP. The needs of the community are indeed evaluated by United Way committees comprising Sandians and people from the community. We agree with you that family planning is an important issue. Many family counseling organizations are on the list of those receiving money from ECP contributions. While they may not be solely concerned with family planning issues, they provide a variety of related and needed services. Examples are YWCA, Peanut Butter & Jelly Pre-School, Family and Children's Services, the UNM Rape Crisis Center, the Girl Scouts, Hogares Inc., and Youth Development Inc. Also, any agency may refer a client to another agency with expertise.

As you point out, Sandians can direct their dollars through the donor option program. Dozens do so to support Right to Life, Planned Parenthood, and other groups that have positioned themselves to address this problem, despite the fact that 10 percent goes to United Way to defray administrative costs. We speculate that this is because not all of us can afford to write a hefty check to our favorite charity and prefer to donate a little at a time; also, many of us like to show the difference Labs employees make in the community.

Herb Pitts (3100)

Favorite Old Photo

MY FATHER, William Hindi, is seen here in a formal portrait in native garb when he returned to Lebanon in 1923 to wed my mother (his cousin), Rasmiea, in an arranged marriage. He was 39 at the time, and she was 19. Father originally came to New Mexico in 1908 and sold general merchandise out of a covered wagon to ranchers on a route that included Duran, Estancia, Santa Rosa, Carrizozo, Cedarvale, Willard, and Mountainair. He brought two brothers and a nephew over from Lebanon in 1912 to help him. The family started a general merchandise store in Duran and bought many homesteads in the area, eventually accumulating a ranch with more than 50,000 acres. The ranch is intact, and many of my cousins are still there. Dad died in 1964 and is buried in Duran.

— Shawkeet Hindi (3914)

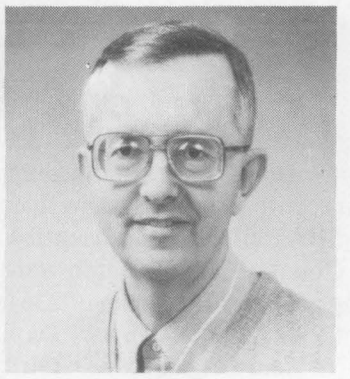
MILEPOSTS

LAB NEWS

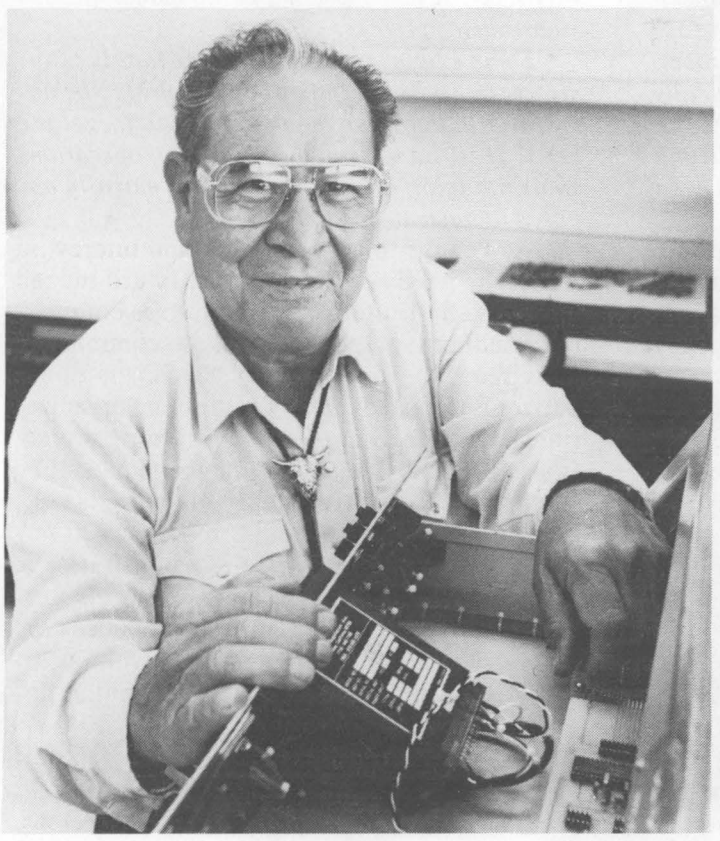
May 1992

Archie Lackey
9215 35

Maryanne Cunningham
9120 15



James Poukey
1241 25



Gilbert Leyba
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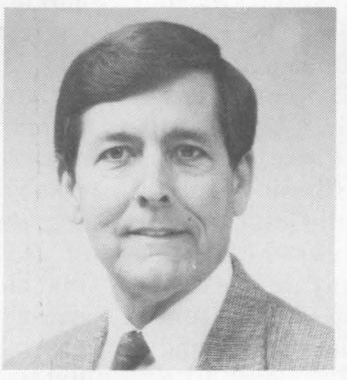
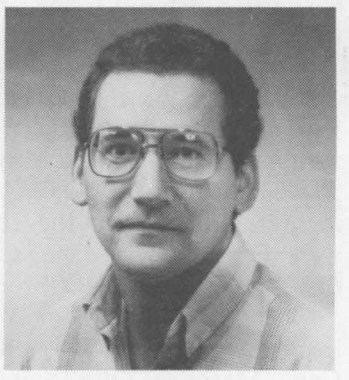
Stephen Winters
9323 25



Dennis Hayes
5600 35



Larry Karkiewicz
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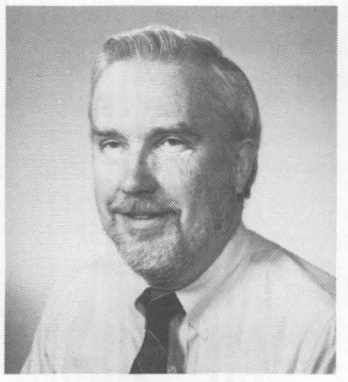

Don Nissen
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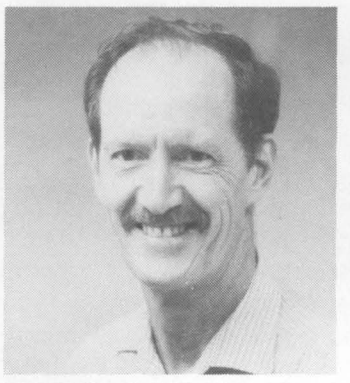

Frank Ezell
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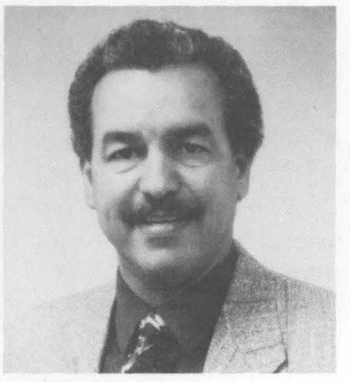

Nestor Ortiz
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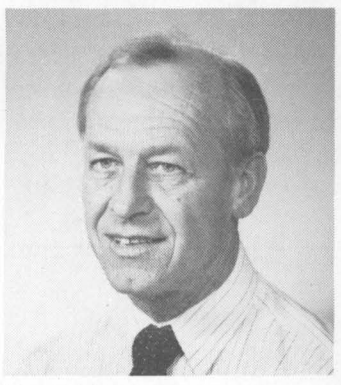

Henry Hanser
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Alice Montoya
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Bob Reed
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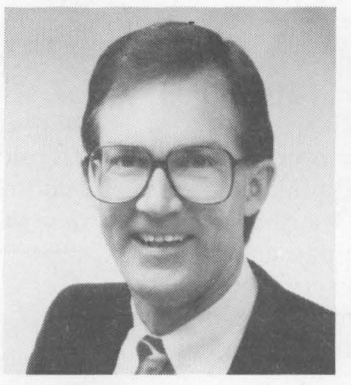

Tom James
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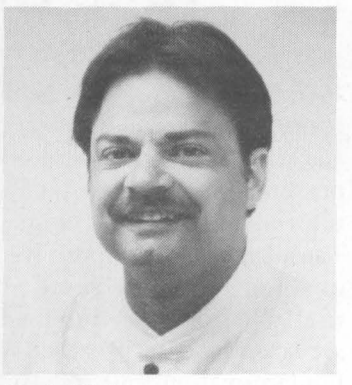

Mark Weber
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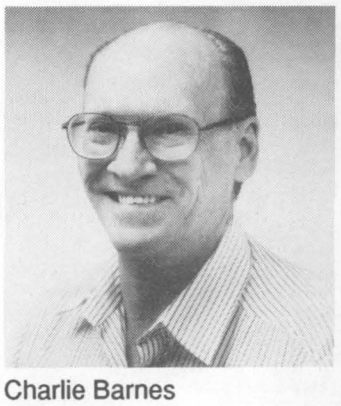

Charlie Barnes
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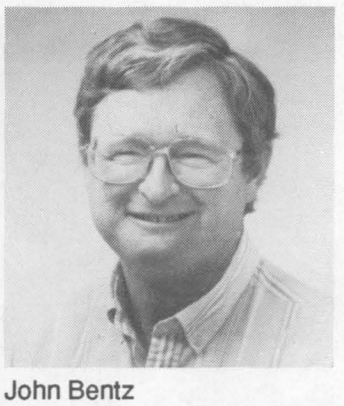

John Bentz
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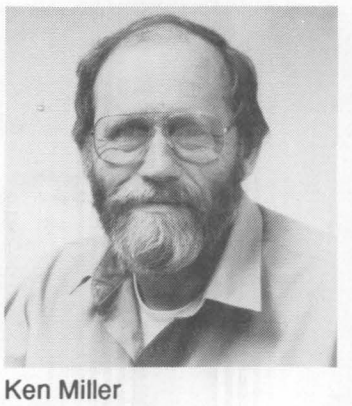

Ken Miller
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Louis Nogales
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Otto Simon
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Marion Apodaca
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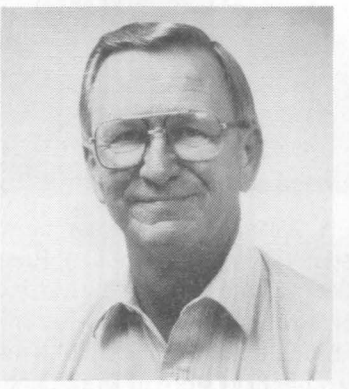


Ed Roberts
9615 25

Food, Folks, & Fun — Retiree Picnic Scheduled for Thursday, May 21

The 29th annual retiree get-together (the 22nd annual picnic) will be Thursday, May 21, at the Coronado Club from 4 to 7 p.m.

The event is for all Sandia retirees and their spouses and for surviving spouses. Food and soft drinks will be provided.

Parking is available at the Coronado Club, the nearby chapel, Que Pasa Recreation Center, Kirtland Hospital, and Sandia Base School east of the Club. Handicapped parking is available in front of the main Coronado Club entrance, and handicapped persons only should use that entrance. All others should use the pool/patio entrance at the rear of the Club. A shuttle bus will operate from the parking lots on "B" Street to and from the pool/patio entrance.

People attending the picnic are asked to please observe the no-parking signs along the streets in the residential areas near the Club.

Music will be provided by the Bob Weiler Band, and members of Sandia's Large Staff will join in the activities.

Retirees are reminded that the picnic is for adults only, so please bring only pictures of those gorgeous grandchildren.

Sympathy

To Judy Geitgey (3144) on the death of her father in Santa Maria, Calif., March 24.

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

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

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8½ 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

SIMMONS HIDE-A-BED SOFA, dark green, $190. Miller, 255-7716.

INFANT CARRIER, Evenflo "Joy Ride," 1 yr. old, $22. Schkade, 292-5126.

SEARS EXERCISE BICYCLE, $75; Delco 6-way power seat unit for Ford pickup, $150; Hoover upright vacuum cleaner, $50. Lindsay, 881-0709.

'78 GREAT DIVIDE TRAILER, 20-ft., dual axle, self-contained, very good condition, $2,950 OBO. Young, 869-3384.

THREE ANSWERING MACHINES, $5/ea.; car alarm, $5; window air conditioner, 18" x 18" , $10; tire, 235/15, $5; crib & mattress, $80. Hayes, 299-1200.

WINDSURFING EQUIPMENT: Windwing 4.0m² 1 cam, 5.02m² race, 5.6m² race; Aerotech 6.3m² monofilm race; aluminum mast, 15'-1", CC, 7.4 DIN. Ritchey, 298-4311.

GE ELECTRIC RANGE, harvest gold, excellent condition, $75. Myers, 294-1648.

SUEDE SHEEPSKIN JACKET, size 38-40 short, paid $300, $150 OBO; 4 chrome rims, 15", 5-hole, fit Ford, $125 OBO. Corona, 294-2811 after 5:30 p.m.

TWO COUCHES, 2 metal desks (30" x 60"), color & B&W TVs, answering machine, waterbed frame, Octagym, office cabinet, stereo console, more. Gutierrez, 247-1076.

TRUCK TIRES: 235/85/R16, usable tread, 4 tires for $60; step bumper, gray, for full-size Ford pickup, $35. Conley, 296-2170.

LABRADOR PUPPIES, purebred, no papers, all black, $80 both male & female. Carson, 899-8399.

RECLINER, dark-gold upholstery, $75. Harrison, 884-4994.

THREE SOFAS, w/matching coffee and end tables, good condition, $75/ea. Hunter, 298-0964.

SONY BETAMAX VCR, Model SL-2710, like new, originally $1,200, will sell for $250. Matthewson, 883-6649.

WALKIE-TALKIES, Realistic 3-watt solid-state, barely used, $50. Anderson, 897-2772.

ROLLTOP DESK, $250; Macintosh computer w/software, $50; keyboard, $50; garage & bake sale, May 2, St. Thomas Episcopal Church. Hughes, 265-1698.

KIMBALL PIANO, 68 yrs. old, ivory keys, good condition, $600. Kelsey, 292-4768.

BALDWIN ACROSONIC PIANO, $900; Drexel furniture, table, 2 armchairs, 6 side chairs, china cabinet, server, $850; crystal chandelier, $100. Kadlec, 299-2034.

DROP-LEAF TABLE, Duncan Phyfe, mahogany, w/1 extra leaf, $130; cedar chest, $125. Vandetti, 299-2318.

FOUR-PERSON INFLATABLE RAFT, w/electric motor, battery & box, motor bracket, pump, oars, canvas bag, $170. Schroll, 299-9142.

OAK DINING TABLE, contemporary, seats 10, excellent condition, 60" x 39" x 29", w/2 20-in. leaves, $300. Reilly, 298-6517.

WEDDING DRESS, size 10, veil & slips, cost $1,200, sell for $500; maple desk, $300; 3 oak veneer desks, $150/ea. Wehrle, 299-2959.

WINDOW AIR CONDITIONER, 2,800 CFM, used 4 mos., cost $155, $50; Ozark Chef barbeque, w/electric rotisserie, $20. Denish, 256-1559.

MAPLE BUTCHER BLOCK TABLE, 2" thick x 42" dia., chrome pedestal, w/4 brewer-style caneback chairs, $225. Kolb, 271-1775.

TRACTOR, old Allis Chalmers orchard size, $400. Simmons, 281-5012.

SOFA, stepladder, freezer, lawn furniture, Mixmaster, space heater, carpet shampooer, large print pillows, table lamp, creeper, Toro lawn mower. Dippold, 821-5750.

MACINTOSH SE FDHD COMPUTER, 20-meg. hard drive, 4 megs RAM, dual disk drive, reads/writes PC-formatted disks, $1,000. Ferrell, 888-3023.

DAIWA EXCELLER DRIVER(S), graphite, $80; 2 MacGregor drivers, Pers. Hd, S & R, $50; Powerbilt H&B Citation Pers. reg., $75; new Ginty, $35. Stang, 256-7793.

SCHWINN EXERCISE BICYCLE, good condition; Chris Evert tennis racket, good condition. Neiswander, 884-7142 after 5:15 p.m.

YAMAHA PIANO, 52-in. ebony "Professional," 1 yr. old, $5,900; Minolta Maxima 7000 camera, AF35-105, also flash & tripod, $400. Brown, 839-4185.

COMMODORE 128 PC, 1571 disk drive, word-processing, spreadsheet, filing, & games 64 software, 1525 printer, $100. Whitehill, 298-2011.

PINE WORKBENCH, w/vise for woodworking, very solid, $75. Ballard, 828-2504.

EPSON LX-800 DOT-MATRIX PRINTER, w/stand & paper, $75; 2-Mb AT memory expansion board, $45. Balk, 281-9083.

KENMORE REFRIGERATOR, 3 yrs. old, like new, $275. Gugliotta, 255-5998.

YAKIMA BIKE & SKI RACKS, 3 Road Warrior bike racks (brand new), family-size ski rack (6 prs.). Gerstle, 821-1112.

RUNNING LIGHTS, wire, connector, for utility trailer, $15; electrical material, switches, plates, fixtures, wire, etc., $15; $25 for all. Freyermuth, 299-2053.

GARAGE DOOR GENIE, w/2 hand controls, $50; 85-gal. aquarium, $75; bamboo chair, couch, & king bed. Rael, 884-4778.

HIDE-A-BED SOFA, 80" wide, w/queen mattress, excellent condition, $150 OBO. Roady, 299-6084.

CRYSTAL from Murano, Italy, service for 8 (32 pieces), pattern w/silver rim, $250. Locher, 266-2021.

ANTIQUE KEROSENE JAR, circa 1916, make offer. Blackburn, 293-5978.

PANASONIC COLOR TV, 19-in., $80; Sony CD player, $75; Technics AM/FM receiver, 50-W/ch, $75. Brady, 292-0487.

'86 T-BIRD ROAD-STYLED WHEELS, w/1 new tire, $100; burgundy dash-mat, $15; V-6 fan belt, $15; floor mats, $10. Palmer, 256-3164.

LADY HAMILTON, 14kt white gold, 40 dia case, dia bracelet, 10.3 dwt., Butterfield appraisal $2,395, sell for $900 OBO. Harrison, 821-9099.

TWO MATCHING MOTORCYCLE HELMETS, Yamaha, maroon, large & med., like new, $40/ea. Adams, 821-9079.

FENDER, left front '64 Chev. Impala or Biscayne, $40; aluminum patio cover, 8 x 20, $200; screens, 3-lite casement, copper/steel frame. VanVickle, 299-1240.

SOFA, ivory/cotton w/feather cushions, 108" long, slightly curved, elegant, $150. Renk, 242-1277.

MULTI-FAMILY YARD SALE, 7001 San Antonio NE, Fri., May 1, & Sat., May 2, 9 a.m.-3 p.m. Mozley, 884-3453.

TWO LAMPS, table size, brass, $45/pr.; gas outdoor grill, $20. Esch, 298-8914.

STUDENT DESK, $30; 6-drawer chest, $30; twin bed w/headboard, frame, & springs, $50; antique vanity w/mirror, $175. Graham, 293-7302.

GARAGE SALE: bar stools, mini-blinds, clothing, misc., Sat., May 2, 8 a.m.-2 p.m., Taylor Ranch, 4816 Galleta Rd. NW. Diltz, 899-0372.

COMPLETE KING-SIZE WATERBED, w/6-drawer pedestal, $200 OBO. Griego, 888-7906 after 3:30 p.m.

AKC-REGISTERED BEAGLES, bring your Snoopy home, 4 wks. old, available May 16, all are cute, $150. Fitzgerald, 884-4607.

QUEEN-SIZE WATERBED, 12-drawer pedestal, bookcase headboard w/mirror, asking only $275. Howard, 839-9203.

REVOLVER, S&W Mod. 36-6, 38 spec., 3-in. full lug barrel, adjustable sights, Hogue grip, excellent condition, $225. Parks, 884-7475.

LAWN MOWER, 3-1/2-hp Briggs & Stratton, 20-in., rear-bagger, recently tuned, $75. Haines, 293-8911.

TRANSPORTATION

'83 OLDS. CUTLASS BROUGHAM, 4-dr., 5.0L V-8, AT, PS, AC, tilt, cruise, new tires & brakes, always garaged, $2,000. Jorgensen, 298-9834.

'81 DELOREAN, 8,500 miles, 5-spd., leather, AC, AM/FM cassette, below book, $18,000 negotiable. Corbin, 296-4121.

'90 YAMAHA FZR600RA-B MOTORCYCLE, like new, ridden 10 mos., 1,900 miles, silver, helmet included, $3,800. Walter, 293-0712.

'80 TOYOTA CELICA, white, excellent condition, 5-spd., runs great, looks great, $1,799 OBO. Wisler, 821-4793.

FIBERGLASS BOAT, 9-ft., w/trailer, best offer. Hughes, 265-1698.

TAKARA RACER BICYCLE, 24-in., 10-spd., excellent condition, for small adult or teenager, $65. Holmes, 292-0898.

'80 SUZUKI GS1000G, fully loaded touring bike, 22K miles, very good condition, $1,500. Potter, 869-4716.

BERTIN TANDEM BIKE, M&F, good condition, $900; Infinity recumbent bike, very good condition, $1,000. Babcock, 299-3121, leave message.

'84 FORD ESCORT, 2-dr., 4-spd., $1,000. Hickox, 299-0772.

SAILBOATS: AMF Sunfish, almost new, $950; AMF Force 5, new, $1,495; AMF Zuma, never used, $1,395. Ahr, 821-6905.

'70 MGB, '72 engine, unleaded gas, runs well, needs tuneup, body good, interior needs work, $1,800 OBO. Wallner, 839-9041.

'74 MAVERICK SEDAN, grandma's car, 48K miles, well maintained, $1,475. Shunny, 265-1620.

'69 FORD CONVERTIBLE, 429 4-bbl., 4-spd., 44K miles, new front end, tires, clutch, battery, driver's door crunched, $3,900 cash. Packwood, 255-6644.

'86 HONDA CRX, one owner, excellent conditon, maintenance records, 50-mpg, 66K miles, 5-spd., AC, $4,000. Bush, 281-3773.

'80 YZ250G DIRT BIKE, new top end, chain, rear tire, & brakes, includes all riding/maintenance items, $800 OBO. Pantuso, 892-3641.

'81 MAZDA RX7, 5-spd., white, AC, new tires & front brakes, runs great, asking $200 below book, $1,975 OBO. Rowland, 281-5795.

TEAM FUJI 12-SPD. ROAD BIKE, 57cm frame, Scott DH handlebars & standard drop bars, Araya 700c rims, $110. Gerwin, 292-5571.

'76 TOYOTA LAND CRUISER STATIONWAGON, 4-WD, 4-spd., 102K miles, Alpine stereo, $1,600. Gerstle, 821-1112.

'74 MERCEDES-BENZ 280C, gas engine, low mileage, new $2,000 paint job, $7,200. Luther, 293-4462.

REPO: '89 Toyota Supra Celica Liftback Turbo, 49,894 miles; bids accepted through May 5; we reserve the right to refuse all bids; subject to prior sale. SLFCU, 293-0500.

SEARS 10-SPD. BIKE, package includes helmet, extra seat, handlebars, basket, pants clips, lock chain, & tire tools, $30. Meikle, 299-4640.

CANNONDALE MOUNTAIN BIKE, 20-in. frame, excellent condition, includes Blackburn rack, odometer, 2 water-bottle cages, pump, $475. Halsey, 299-2023.

BOY'S 5-SPD. BIKE, 26-in., $40; boy's 10-spd. bike, 27-in., $15. Blackburn, 293-5978.

'85 STRATOS FISH/SKI BOAT, 17'8", Black Max Mercury 185-hp, S/S prop, graph, downriggers, windshield, troll motor, depth finder. Shipp, 281-1997.

BICYCLES, 16-in., $25; 12-in., $20. Hudson, 884-7621.

'83 DODGE RAM CHARGER, 4x4, PW, PS, AT, AC, tow package. Cornelison, 898-4382.

'69 VOLVO 145, tan, 4-spd., AC, safe, reliable transportation, shop manual, maintenance records, $995 OBO. Caskey, 294-3218.

'78 GLASTRON BOAT, 15-1/2-ft., 115 O.B., open bow, seats 6, PT/tilt, stereo, fish finder, tilt trailer, nice boat, $4,100 OBO. Cook, 869-6921.

'80 MONARK BASS BOAT, Mariner 60, trolling motor, live wells, pedestal seats, depth finder, $3,000. McNiel, 869-6835.

'78 SUBARU STATIONWAGON, 4-WD, 89K miles, new tires, runs well, $550. Casper, 268-4464.

TWO BICYCLES: man's 10-spd. Raleigh, 27" x 1-1/4" tires, excellent condition, $80; girl's bike, 3-spd., 26-in. wheels, $30; both for $100. Freyermuth, 299-2053.

REAL ESTATE

FOUR-PLEX, 2-bdr. apartments, SE, near Base, brick, sprinklers, 3,300 sq. ft., large owner apartment, 1,500 sq. ft., $80,000. Lusader, 298-3469.

2.7-ACRE LOT, property zoned A-1, located east of Coors Road in the Maplewood Drive area, $66,000. Romero, 884-3263.

1/4-ACRE LOT, custom area, NW Albuquerque. Mazze, 299-4568.

3-BDR. HOME, 1,877 sq. ft., 1-3/4 baths, .26-acre, assumable 8.5%, excellent condition, amenities, Paradise Hills, $128,900. Showalter, 898-1836.

3-BDR. HOME, 1,450 sq. ft., 2 full baths, 2-car carport, located in Sun North Estates in NE Heights, $66,900. Bronkema, 821-2119.

4-BDR. HOME, Taylor Ranch, 3 baths, 2-story, 2,000 sq. ft., landscaped, sprinklers, security system, assumable 10% FHA, $111,900. Frasco, 897-0872.

3-BDR. MOBILE HOME, refrigerator, washer, dryer, garbage disposal, carpeted, 1-3/4 baths, covered sundeck, more, very nice. Rael, 884-4778.

3-BDR. CONCHAS LAKE HOUSE, 1,300 sq. ft., 1-3/4 baths, garage, covered deck, fenced 100' x 100' lot, lake view, $45,000. D'Antonio, 293-4043.

1/4-ACRE LOT, Volcano Cliffs subdivision, Taylor Ranch, fantastic views, $34,000, includes assessments. Randour, 298-5684.

6 ACRES, Los Chavez, 5 miles south of Los Lunas. Silva, 892-3537.

80 ACRES VACANT LAND, 3 miles north of Stanley on NM-41, flexible terms. Doughty, 296-4142.

WANTED

ROLLERBLADES, Lightning model, size 8-1/2; hockey stick; prices negotiable. Malcomb, 294-6975, leave message.

STUDENT DESKS for teenagers, prefer wood construction. Essenmacher, 865-7066.

MIDI KEYBOARD for beginner. McCoy, 292-9114 after 5 p.m. or on weekends.

WORKER(S) to do occasional yardwork, etc., will pay $5 per hour cash. Davie, 296-3950.

MOTORIZED CEMENT MIXER; Enduro-type motorcycle, street/trail use, 175cc to 500cc size, good condition only. Kureczko, 281-8206.

KODAK CAROUSEL, Transvue 35mm trays, up to 30 trays, cheap. Berry, 898-1400.

MAN'S ROAD BIKE, 60cm frame or larger. Harrigan, 266-4143.

SITTER for 7-yr.-old girl, from June to August, must be able to drive. Molina, 292-4117.

MOTORCYCLES, dirt or street; other mechanical things. Pryor, 294-6980

WORK WANTED

COLLEGE STUDENT will house & pet sit this summer, excellent references. Harrigan, 266-4143, ask for John or Erik.

Coronado Club Activities

Cinco de Mayo Celebration Tonight

FIESTA! — Tonight, May 1, the Club is celebrating Cinco de Mayo just a few days early. There's music, of course: Joe Sais & Showcase, who will be on stage from 7 to 11 p.m. As special entertainment, Ballet Folklorico Rio Grande, a Mexican folk dance troupe, will perform from 8 to 8:30 p.m. You'll say olé to the dinner menu: sizzling fajitas ($7.95), combination plate (enchilada, taco, and tamale for $6.95), or an all-you-can-eat buffet, with red snapper Vera Cruz and baron of beef ($6.95). Call 265-6791 for reservations.

BINGO FOR A BIKE — Kids' Bingo and Family Night are the attractions next Friday evening, May 8. Top prizes will be two bikes, one girl's and one boy's. A buffet will be served from 5 to 7 p.m., featuring a hot dog, fries, and soft drink for 99¢ (kids 12 and under) or salad, pizza slice, spaghetti with meat sauce, and garlic bread for $3.50. Bingo starts at 6 p.m.

SPEAKING OF BINGO — Regular Thursday bingo is one of the C-Club's most popular activities. Fun is a sure thing those evenings, and winning a prize is always a possibility. The early-bird session starts at 6:45, and regular bingo right afterward. Come on out and take your chances on May 7 and 14, but note that there's no bingo May 21 or 28 because of pre-empting events.

BRUNCH FOR MOM — Better make reservations now if you want to take Mom to the Club's fabulous Mother's Day brunch on Sunday, May 10. There's a menu just like she would want it, available from 10 a.m. to 2 p.m. Then, to top off a perfect occasion, Bob Weiler and Los Gatos will provide the music until 5 p.m. The cost is $8.95 for adults, $4.95 for kids 4-12, and free for toddlers 3 and under. Adult guests are $9.95. The only catch: Reservations are filling up fast. Call 265-6791 right now!

Take Note

The "KNME-TV 5 Discoverland for Children" will be held on Saturday and Sunday, May 2 and 3, at the New Mexico State Fairgrounds (Manuel Lujan Building, Exhibit Hall A) in Albuquerque. The event will feature carnival booths with Public Broadcasting System children's programming themes, *Sesame Street's* Cookie Monster, educational booths, an auction of unique children's items (Sunday), and entertainment by several New Mexico children's groups. Hours are 10 a.m. to 6 p.m. Admission is $1, with proceeds to benefit KNME-TV. More information is available from KNME-TV's Anita Livingston on 277-1227.

* * *

The 1992 New Mexico Arts & Crafts Fair is looking for volunteers. Fair dates are June 26 to 28. If you are interested in helping put together one of the oldest and largest arts and crafts fairs in New Mexico, please call 884-9043.

* * *

Retiring and not shown in LAB NEWS photos: George Baldonado (151).

Events Calendar

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

May 1 — Concert, the Chamber Orchestra of Albuquerque with soprano Sandra Neel performs Stravinsky, Bach, and Warlock; 8:15 p.m., St. John's United Methodist Church (2626 Arizona NE), 881-0844.

May 1 — May Day Ball, the New Mexico Jazz Workshop presents the Cap/Pierce Juggernaut Big Band in a charity ball to benefit the All Faiths Receiving Home and the New Mexico Jazz Workshop; 8 p.m., Albuquerque Convention Center, 255-9798.

May 1-2 — Spring Dance Concert, "Together Again," UNM dance ensembles, featuring ballet, flamenco, and contemporary styles; 8 p.m., Rodey Theatre, 277-4402.

May 1-3 — "The Country Girl," drama by Clifford Odets about faded, boozing Broadway star who gets a last chance to play a lead role; 8 p.m. Fri.-Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

May 1-3 — Spring Arts and Crafts Expo '92, arts & crafts, food; 10 a.m.-6 p.m. Fri-Sun.; Exhibit Halls B & C, State Fairgrounds, 884-8476.

May 1-15 — "Architectural Photography: The First Hundred Years," exhibition charts the development of a distinctive aesthetic of architectural photography; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

May 1-15 — "Ed Garman — Ideal-Modern," exhibit of paintings showing influence of modernism on contemporary art; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

May 1-17 — Annual Art Graduate Student Exhibition, recent and experimental studio work by graduate students in UNM's Art and Art History Department; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

May 1-24 — Exhibit, "Natural Natives: New Mexico Wildflowers," photographs by Betty and Roy Stradford; 9 a.m.-5 p.m., East Gallery, New Mexico Museum of Natural History, 841-8837.

May 2 — Third Annual Maxwell Museum Benefit Auction, Southwestern crafts, ethnographic materials from around the world, Native American crafts, exhibits, foods, and music; 11 a.m.-4 p.m. (11 a.m. preview, 1 p.m. auction), Maxwell Museum of Anthropology, 277-4405.

May 2 — 18th Annual Strawberry Festival, Serendipity Day School children's fair, live entertainment, food, silent auction; 2 p.m.-7 p.m., Serendipity Day School (801 Girard NE), 255-7336.

May 2 — Svirka Women's Balkan Chorus, with special guests Sandanski; 8 p.m., St. Andrew Presbyterian Church (5301 Ponderosa NE).

May 2-3 — Children's Fair, carnival booths, Cookie Monster, more, presented by KNME-TV; 10 a.m.-6 p.m., Lujan Bldg., State Fairgrounds, 277-2121.

May 3 — Cinco de Mayo Celebration, Spanish music, food, games, international stars; 10 a.m.-8 p.m., Civic Plaza, free, 265-8331.

May 5 — "Real Women Have Curves," as they toil to fill an order for 100 prom dresses, "real women" discuss everything from men to the "migra," sponsored by the South Broadway Cultural Center; 8 p.m., UNM Continuing Education Center (1634 University NE), 848-1320.

May 5 — Special Concert, violinist Midori performs with the New Mexico Symphony Orchestra; 8:15 p.m., Popejoy Hall, 843-7657.

May 5 — Tuesday Night Garden Class: Bugs, Slugs, and Other Garden Things; instructed by urban entomologist Charles Ward (NMSU Cooperative Extension Service); 7-9 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.

May 8 — "Romeo and Juliet: A Collage," Opera Southwest presentation of the concert version of Bellini's & Gounod's operas; 8 p.m., KiMo Theatre, 764-1700.

May 9 — Inca, songs and dances performed in their original formats illustrate the variety of music and rhythms found in Peru's mountains; 8 p.m., South Broadway Cultural Center, 848-1320.

May 9 — "Ticket to Travel '92," Living Through Cancer's annual fund-raiser, extravagant vacation prizes; noon-5 p.m., State Fairgrounds, 242-3263.

May 9 — "Hopi Spirits: Contemporary Kachina Doll Carvers," exhibit opening, Indian dancing, carving demonstrations, food; 10 a.m.-4 p.m., Maxwell Museum of Anthropology, free, 277-4405.

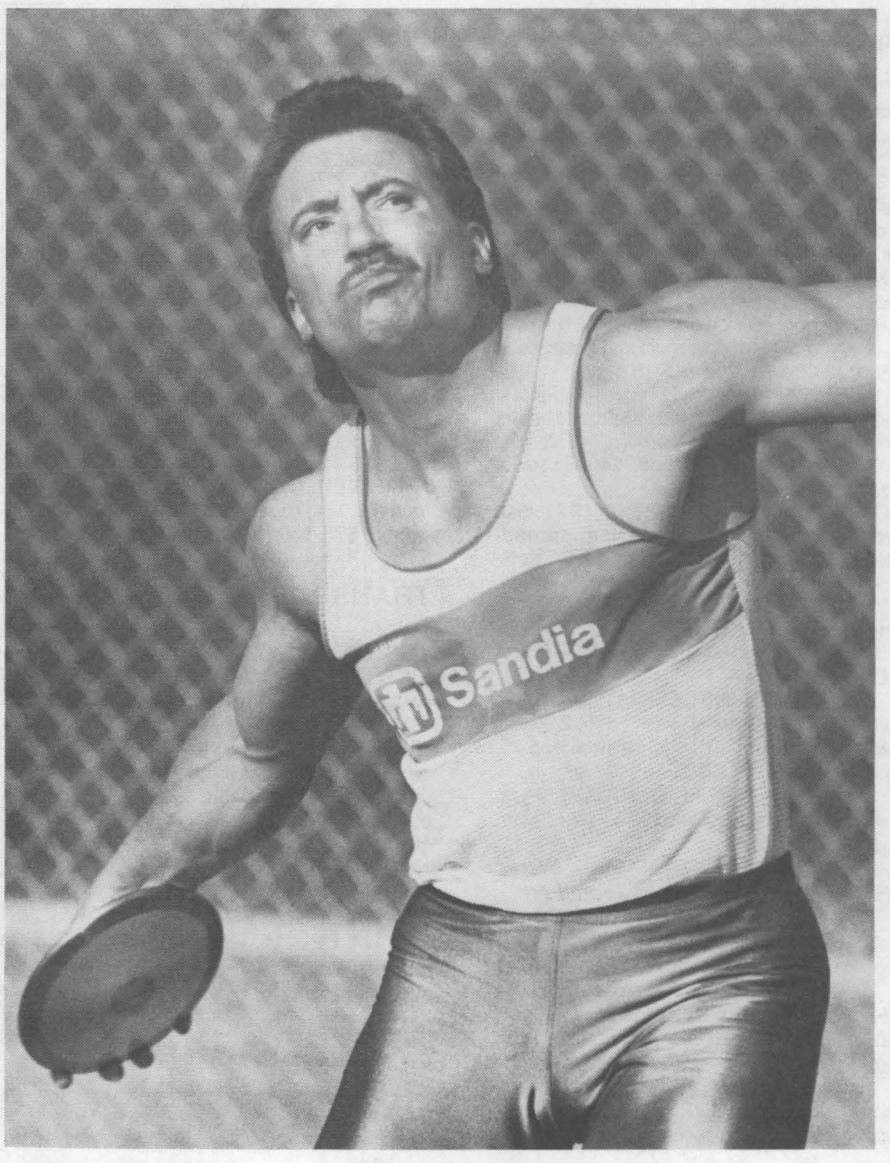
May 9-10 — "Countdown to Glory," 35th Annual Iris Show, presented by the New Mexico Iris Society; 4-7 p.m. Sat., noon-6 p.m. Sun.; Albuquerque Garden Center (10120 Lomas NE), 881-3859.

May 10 — Mother's Day Concert, New Mexico Symphony Orchestra performance in honor of mothers everywhere; 2 p.m., Rio Grande Zoo, 843-7413.

May 10 — Mother's Day Celebration, special activities for moms; call for details, Indian Pueblo Cultural Center, 843-7270.

May 10 — Mother's Day Concert, sponsored by the South Broadway Cultural Center, featuring Joey Gonzales & La Gavilla, Al Hurricane, Santiago Jiminez, Jr. (from San Antonio), plus food booths, games, and arts & crafts; noon-6 p.m., South Broadway Cultural Community Park (1025 Broadway SE, behind the Cultural Center), 848-1320.

May 12 — Tuesday Night Garden Class: Water Gardens, instructed by Nancy Griego (Corrales Water Lily Gardens); 7-9 p.m., Albuquerque Garden Center (10120 Lomas NE), 296-6020.



LAUNCHING IT — Richard Cernosek (1315) practices the discus in preparation for the Southwest Regional Corporate Cup Challenge in Albuquerque (Milne Stadium) May 29 through 31. Richard is an 11-year veteran of the Sandia Track and Field Club and participates in several events. Club members compete as a team at the regional meet, and members can be selected to participate at the annual US Corporate Athletic Association national meet as part of the AT&T team (Richard was on the 1990 AT&T team). Another event coming up for Sandia club members is a May 17 cross-country run for men and women and a 3K race-walk. The emphasis of the Sandia club is not on competition, but on participation and fun, says club president Peter Green (1845). New members of all ages are welcome. For information about upcoming events (sign-up deadline is May 5) and about club membership, contact Peter on 823-4486.