

Compound Semiconductor R&D Expands in New Clean Room

Inside Sandia's newest clean room resides some of the most precise equipment ever devised. It is being used to fabricate new materials and semiconductor structures that will be the building blocks of future optoelectronics and microelectronics.

This equipment can lay down layers of semiconducting materials as thin as a single atom, making it possible to construct high-performance transistors, high-power semiconductor lasers, and detectors with tailored spectral responses.

Completed recently in Bldg. 893, the clean room contains about 3700 square feet of better than class-1000 cleanliness. (In any given cubic foot of air, there will be fewer than 1000 particles larger than 0.5 micron.)

"The new clean room considerably enhances our capabilities for developing new compound semiconductor devices," says Paul Percy, manager of Compound Semiconductor and Device Research Dept. 1140 and director of Sandia's Center for Compound Semiconductor Technology (CCST).

Not Mother Nature's Own

Compound semiconductor materials — compounds of Group III and Group V elements, such as gallium arsenide — have been under development for some time, but much of Sandia's work, Paul says, is focused on exploiting the unique optical and electrical properties of a relatively new class of materi-

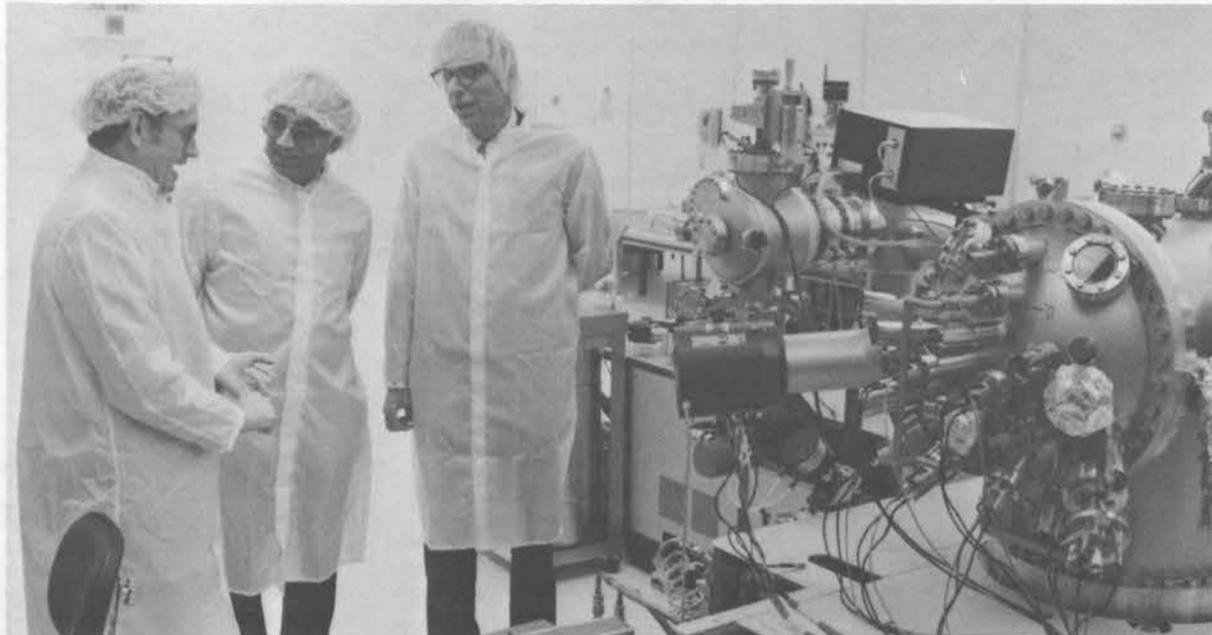
"... our work in strained-layer superlattices and strained-layer systems has been widely recognized."

als known as strained-layer superlattices. These are constructed of extremely thin layers of different semiconductor materials that are combined to form an entirely new material that does not exist in nature. Common structures use aluminum gallium arsenide and indium gallium arsenide, or indium antimonide and indium arsenide antimonide.

These materials were pioneered in Solid State Sciences Directorate 1100 and have opened up a whole new field in compound semiconductor and device research.

"Over the past few years, our work in strained-layer superlattices and strained-layer systems has been widely recognized," says Director Fred Vook. "Early on, our work demonstrated that these materials are extremely well suited for new and improved devices such as optical detectors, light-emitting diodes, semiconductor lasers, and high-speed transistors."

Strained-layer superlattices are now being studied in research labs worldwide. Compared to silicon, these new materials have faster switching speeds, are more adaptable to a wider range of operating



AT THE FORMAL OPENING of the new clean room last month, Research VP Venky Narayanamurti (center) chats with Paul Percy (1140, left) and Fred Vook (1100). Complex equipment, such as the molecular-beam epitaxy system shown here, combined with the clean environment and independent control of the individual beam sources, allows precise fabrication of atomic-scale compound semiconductor structures.

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conditions, and have greater resistance to ionizing radiation.

"We've shown that the variety of band structures available in these compounds can be exploited to create optical devices that have exceptional properties, including radiation hardness," notes Fred. "They will undoubtedly play an increasingly larger role in future weapon systems — both for improved safety and for new capabilities."

New Physics . . . New Devices

Production of compound semiconductor devices is definitely not part of the plan, according to Paul Percy.

"The new clean room will play an important role in Sandia's basic R&D on generic compound semiconductor and optoelectronics device technology," he says. "Our *modus operandi* is to do new kinds of physics and develop new kinds of materials — and then combine the two to create new devices with new capabilities."

The recently developed p-channel, strained quantum well, field-effect transistor is a good example, he says. "This transistor was the direct result of our attempts to understand how to use strain to produce high-speed positive charge carriers in com-

"... these compounds can be exploited to create optical devices that have exceptional properties, including radiation hardness."

compound semiconductors. It's a new species of semiconductor device that opens the way to new kinds of extremely fast p-channel transistors."

The new transistor — known by the acronym SQWFET (pronounced "squiffet") — is the first step in developing a complementary logic for compound semiconductors, says Paul.

(Continued on Page Six)

Outside Research Collaborations

The new clean room, Fred Vook says, will attract leading scientists and engineers from universities and industry, allowing co-development of new technologies and facilitating tech transfer. "The clean room is outside the restricted area for just that purpose."

Sandia already collaborates with UNM, the University of California at Santa Barbara, the University of Illinois, Cornell, and Stanford, among others. Fred expects such interactions to increase.

Procedures are also in place, he notes, to expand Sandia's interaction with industry. In addition to the conventional methods of information exchange — presentations at technical meetings and publications in professional journals — seminars, workshops, and person-to-person exchanges are being stepped up.



GUS SIMMONS (200, right) regales now-retired Labs President Irwin Welber and Mrs. Welber with one of his famous stories at Irwin's farewell open house March 30. (See also inside photo of DOE award presentation to Irwin.)

This & That

Love a Librarian -- Many are out of sight but shouldn't be out of mind. I'm talking about Jennie Negin's crew in Technical Library Dept. 3140. Many of us meet the folks at the information and checkout desks, but there are lots more hard at work behind the scenes. National Library Week begins Sunday, so we're taking the opportunity to publish a story this week about the Tech Library and the services available there, including some that may surprise even veteran library users.

A behind-the-scenes tour next week and an April 14 open house (see story for details), will permit you to meet those behind-the-scenes folks. They probably won't even mind if you tell them how much you appreciate their help.

* * *

How's the Fishing, Mike? -- At least they got his name right, says Michael Quintana (6215). He recently got mail addressed to him at San Diego National Lakes in Albuquerque. And it was from . . . the Quality Control Corp. Oops! Last year, Michael got mail addressed to San Dia Natural Lab.

Other recent goodies . . . Bill Caskey (DMTS, 5267) got mail addressed to Sandy A National Lab, Don Hente (contractor) to Sandia International Labs, and Alicia Gamberale (3741) with Sandia correct but to P. O. Box 5800 the Interior. Irene Dubicka (7212) thinks the "Sandia influence" may have surfaced in a letter sent to her in Labuquerque. And somehow, Dan Brewer's (3531) hotel reservation in New Jersey listed him as an employee of Nat. Labs Dandio.

Keep 'em coming, Dandions. It's clean, cheap entertainment -- hard to find these days.

* * *

News from The Hill -- Received a news release last week from our sister lab. The heading: "Los Alamos Names Theoretical Division Leader." Makes me wonder . . . When are they gonna name the real one?

* * *

Bolt Down Your Idols -- I love a good typographical error (as long as it wasn't printed in the LAB NEWS). In a recent, locally published article about burglary in the US: "One burglary attempt takes place every 10 seconds. On average, \$475 worth of gods are taken from each burglarized home." And I thought they went for jewelry and stereos.

* * *

Radio Revisited -- Barry Schwartz (3202) says he heard a car dealership advertise it's "open seven days a week, including Sunday."

* * *

Congratulations -- Phyllis Wilson, a Labs employee since 1960 and LAB NEWS writer since 1985, has been appointed our assistant editor. Phyl does lots of good work around here, including -- at least so far -- keeping a new editor out of major trouble. Congratulations Phyl, and keep up the good work, mainly that last part.

* * *

Gotta Be Honest -- I promised to name the winner today of the rename-the-column contest, announced last issue. Unfortunately, there is no winner. We got several entries, but none with that "magic ring." So, we'll continue to use "This & That." There's no truth to the rumor that we didn't pick a winner because I'm too cheap to buy the promised lunch; we'll have a drawing for those who entered. I'll be in touch.

(My department manager says I oughta name the column "Live & Learn" after this experience.)

●LP

Welcome

Albuquerque

Russell Bonn (7555)
Brett Coningham (7824)
Patrick Sanchez (3426)

Arizona

Jay Vinson (2174)

Georgia

Dawn Bishop (1112)

Illinois

Yong Hwang (1411)

Nebraska

Steven Rezac (2315)

New Jersey

Stephen Wheat (5219)

New York

Stephen Crowder (7223)

Pennsylvania

Shawn Leslie (5111)

Congratulations

To Gayle and Tim (7476) Gardner, a daughter, Alyssa Mae, March 7.

To Barbara (7484) and Steven Botsford, a son, Colin William, March 8.

To Elizabeth and Eric (3426) Chavez, a daughter, Tiana, March 12.

To Jeanne (2341) and Stan Lewis, a son, Garrett, March 20.

Sympathy

To Martin Gonzales (7818) on the death of his mother in Las Vegas, N.M., March 16.

To David Foral (7526) on the death of his father in Lincoln, Nebr., March 20.

To Jimmy White (7213) on the death of his father-in-law in Albuquerque, March 28.

To Carl Bailey (2644) on the death of his mother in Albuquerque, March 29.

Death



George Wladika of Engineering Procedures, Specifications, and Support Div. 2833 died March 23 after a long illness. He was 66 years old.

George had been a member of the Labs staff since 1954.

He is survived by his wife, son, and daughter.

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Medical Corner

Mental Health Roundtable: Interpersonal Communications

The quality of your interpersonal relationships can have a strong impact on your health — especially your *mental* health.

"Unfortunately, conflicts between people often deteriorate into quarreling or engaging in a battle of wills," says Sandia clinical psychologist Arlene Price (3330). "Sometimes, people simply don't say anything and keep their feelings to themselves. Or they back themselves into corners from which they can't get out without losing face.

"The result: a great deal of frustration, resentment, and hurt."

Early in 1988, Albuquerque clinical psychologist Bill Fishburn talked to Sandians about interpersonal relationships. His suggestions prompted many employees to request a repeat appearance.

"Springtime means renewal — a new lease on life," says Arlene. "So it's timely that Bill join us to answer questions and address concerns about interpersonal-communication skills at the next Mental Health Roundtable."

The discussion is set for Wednesday, April 12, at 12:15 p.m. in the Technology Transfer Center. You may bring your spouse or a friend.



Exploring Careers in Math and Science



Ever wondered why your nose is your nose — and not your elbow? Or how gorillas “speak”?

Some 300 junior and senior high school girls from the Livermore area learned the answers to these questions (and many others) when they participated in the recent “Expanding Your Horizons in Math and Science” conference at Las Positas College.

Sandia Livermore and Lawrence Livermore National Laboratory, along with several other firms, co-sponsored the day-long meeting. The conference, designed to increase young women’s interest in math and science careers, was the 11th annual such confab.

Large Turnout

“This year’s turnout was the largest since 1980, when astronaut Sally Ride was the keynote speaker,” reports conference co-chair Lois Johnston (8317). “Sandia support was considerable: 47 Sandians were involved in one way or another — and we also provided equipment and facility support.

“It was well worth the effort. If the success of a conference like this can be measured by participants’ interest and how much they seemed to learn, this one was highly successful.”

One of the featured speakers at the conference was Mitzi Phillips of The Gorilla Foundation; she described how Koko, a Foundation gorilla, is learning to “speak” through sign language. “Why Your Nose Becomes Your Nose and Not Your Elbow” was the topic of the other speaker, Mina Bissell, director of the Cell and Molecular Biology Division at Lawrence Berkeley Laboratory.

Sandia workshop leaders were Lynda Hadley (8285) — photography; Beth Fuchs (8243), Ellen Meeks (8245), and Jeanne Yu (8245) — mechanical engineering; Terry Porter (8235), Karen Sheaffer (8235), Celeste Rohlfing (8341), and Bernie Marx (contractor) — computer graphics; Karen Siegfried (8514) — chemistry; Tory Bobo (8452) — electrical circuitry; and Juan Meza (8233) and his wife Julia Olkin (Stanford Research Institute) — mathematics.

Hands-on Experience

“The students really enjoyed the hands-on electronics experience in my workshop,” says Tory. “In fact, some of them stayed late at the end of the day to find out more.” Tory’s workshop activities included designing a simple lie detector, an electronic reflex tester, and a light-sensitive burglar alarm. Participants also learned how to build small electronic circuits.

Juan and Julia demonstrated how mathematics



HEATHER CHRISTOPHERSON, East Avenue Junior High student, learned the ins and outs of computer graphics at the recent “Expanding Your Horizons” conference at Las Positas College. Looking on are (standing, from left) Bernie Marx (contractor), Terry Porter (8235), Celeste Rohlfing (8341), and (seated) Karen Sheaffer (8245).

can be used as a modeling tool in engineering and science projects. “Workshop participants obviously regarded Julia as a great role model,” says Juan. “They asked her things such as ‘What’s it like to be a female mathematician in private industry?’ and ‘What courses prepared you for your work?’ ”

Thirty-six representatives from colleges and universities, industry, government agencies, and professional societies were on hand to answer questions from the students and their parents and teachers (who attended adult-oriented workshops during the day).

Sympathy

To Mary Johnson (8343) on the death of her mother in Brookfield, Conn., Jan. 23.

To Curt Specht (8445) on the death of his grandmother in Lodi, Calif., Feb. 14.

To Annette Newman (8284) on the death of her mother in Livermore, Feb. 24.

To Mike Daniels (8454) on the death of his grandmother in Klamath Falls, Oreg., March 10.

Take Note

High-school students are invited to attend the Sixth Project Uplift: Space/Technology Career Expo April 14-15 at UNM’s Johnson Gym. Activities include guided tours through several UNM facilities, and information booths on high-tech careers in New Mexico. For information, call 265-4464.

Cultural Diversity Colloquium

Georgia State University Urban Education Prof. Asa Hilliard will present “Free Your Mind, Return to the Source: African Origins” (slides and lecture) April 14 at 10 a.m. in Bldg. 815. Contact host Patricia Salisbury (3510) on 4-9396 for information.

The Albuquerque YWCA will present a “Surviving As an Employed Parent” seminar April 27, 7-9 p.m., at 7201 Paseo del Norte NE. California State University Prof. Gayle Kimball will discuss coping techniques for working parents, support systems, and the importance of sharing family responsibilities. Admission is \$3 at the door. Proceeds benefit YWCA summer “camperships” at Pinon Canyon. Call 822-9922 for information.

* * *

Retiring and not shown in LAB NEWS photos: Alfred Bouton (5145), Reynaldo Gonzales (3425), Donald Mattox (1834), John Willems (7222), William Andrews (7135), Howard Durham (DMTS, 9241), James Stark (1554), Harold Widdows (1552), Don Papineau (3154), James Coughlin (7212), Richard Coughenour (7800), Theodore Krein (DMTS, 7174), and Richard Howell (5111).



FIVE STUDENTS from Las Positas College (formerly Chabot Valley Campus) visited Sandia Livermore March 8 to get the lowdown on careers in engineering and science. Resume-writing and interviewing techniques were the topics when four of the visitors — (from right) Peter Danao, Chris Pirosko, Chris Dolan, and Eric Harwood — stopped in to see David Rosenzweig (8522). During the day, the students also spent time with other Sandia staff people — Mike Hall (8432), Martin Hinckley (8431), and Karen Siegfried (8514) — to learn more about their future careers.

The Goal: A First-Class Library For a First-Class Lab

There's a revolution going on out there. An information technology revolution, that is.

No organization at Sandia is more aware of that fact than Technical Library Dept. 3140, headed by Jennie Negin. "We have some 400 external data bases available," says Jennie, "and they're an essential tool for us."

"During the course of a year, the Reference Division [3144] is asked to do hundreds of searches for information on all kinds of subjects — sometimes very *unusual* subjects: Soviet traffic standards, "blob analysis" (whatever *that* is!), and door construction are some examples. Data bases, classified and unclassified, let us tap the right sources for information in the shortest possible time.

"Service is the name of the game at the library," Jennie continues (see "Library Services Are Many"). "It's our reason for being, and it's what has impressed me most since I moved to the library a little more than a year ago."

'Technical': Not Just Science

The library's for the use of *all* Sandia employees, Jennie emphasizes. "It's called the Technical Library, but 'Technical' in this case doesn't just mean 'science.' It means that we can provide special — and practical — information on a variety of subjects, the basic data Sandians often need to do their jobs.

"We believe a top-notch library at a lab like Sandia is essential. R&D work and many other projects often begin with a trip to the library. That's why we've chosen the theme 'A First-Class Library for a First-Class Lab' for National Library Week, which starts Sunday [April 9]." (See "A Chance to Learn.")

Among Dept. 3140's first-class-library goals is providing complete accessibility to all — including "at-your-desk" service for far-flung types who don't find it convenient to visit the library in person.

Easy accessibility also means unusual hours: The library's open 24 hours a day, seven days a week. "If a patron finds the doors locked, a call to Security will take care of the problem," says Jennie. At times other than official weekday working hours,



REQUESTS FOR REPORTS — classified or unclassified, hard copy or microfiche — are handled by people in Reports Section 3141-1. Dorothy Martin (center) locates a microfiche report from the library's extensive collection in response to one of the library request forms held by Jessica Shaffer (left). Lucille Velardez rounds the corner with a stack of hard-copy reports for requesters.

facilities are available for do-it-yourself copying and book checkout, and there's also limited computer-terminal access.

'Renaissance Users'

Another goal, according to Jennie, is to satisfy the expectations of all kinds of patrons: "We serve not only 'renaissance users' — traditionalists who are used to touching, feeling, and sifting through the literature on their own — but automation-oriented users as well. In the latter case, the library plays an information-broker role by identifying the full range of sources available."

The library also tracks changes at the Labs and sets up special collections when a need arises. A current project is defining — with the help of the recently formed Environment, Safety, and Health Directorate (3200) — a useful collection of literature and resources that can be used by Sandia staff who need ES&H information to do their work.

"The ability to deal with change — to anticipate it, if possible — is important to an operation like ours," says Jennie.

"We invite all Sandians to drop in — next week or any other time — to learn more about the library."

●PW

Library Services Are Many

Which one of the Technical Library's many services benefits the greatest number of Sandians? A leading candidate would have to be the library's extensive collection of books, reports (classified and unclassified), and periodicals. "We have some 50,000 books and circulate about 50,000 a year," reports supervisor Sally Landenberger of Processes Div. 3141. "That's heavy circulation, considering the size of the collection."

Reports, Reference Searches

Sally's division also circulates between 32 and 33 thousand reports — classified and unclassified, internal and external — each year. And obtains about 7000 interlibrary-loan items during a one-year period. And copies, on request, some 12,000 articles each year.

About 10,000 quick-reference searches (involving 30 minutes or less) and 2000 more-extensive, on-line literature searches are run annually by Susan Stinchcomb's Technical Library Reference Div. 3144.

Systems Design Div. 3142, headed by Dennis Rowley, taps into the library's internal data base some 15,000 times per day for both the library staff and library patrons.

Some 275 library customers are also enrolled in what's called SDI ("Selective Dissemination of Information"). This service involves storing current-awareness profiles (determined



STACKS AND STACKS of books are all in a day's work for members of Processes Div. 3141. Here, Janet Padilla (left) and Theresa Garley look over the morning mail delivery and match the books with purchase orders from employees. Meantime, Margaret Reyos catalogs new books for the library collection.

by the user's interests) in a computer that scans a relevant data base for literature citations that would be useful. Some 5700 items were ordered for people enrolled in SDI last year.

Among the library's more unusual services: support of international projects through the translation service. Translator Patricia Newman's (3144) skills include the special knack of speaking in the vernacular of the foreigners with whom she's working, as well as the ability to clarify technical terms as required.

A book on Sandia's first 10 years — produced by the library's History Project — will be published in time for the Labs' 40th anniversary in November. And an effort is also under

way to establish a "real" company archive that includes management-decided policy and procedure changes, as well as weapon program information.

The library also handles records management for the Labs. Each year, some 17,000 boxes of records are stored in — and some 14,000 items retrieved from — what may be the world's largest closet.

Library people responsible for document accountability are also stationed in the mail room. Annually, they process an estimated 52,000 pieces of incoming classified mail (including reports) and distribute 150,000 copies of some 1000 internal reports.

They Make It All Work

Jennie Negin (3140) gives much of the credit for the Technical Library's successes to the folks behind the scenes. "Our backstage people make it possible for us to say 'Yes' when we're asked to help. Without their support, we couldn't get the job done.

"For example, they're the ones who make sure all issues of all journal subscriptions — some 1700 of them — make it to the shelf on time. And they take care of renewals when the time comes.

"They're the ones who process book orders from the line organizations (about 7000 last year) and for the library's collection (another 3000). And the ones who ordered 5000 technical reports for the line and 7500 for the library during that same period.

"If you've ever wondered what happens to those 1075 request forms you send to the library, they're the people who handle them."

Events Calendar

April 7 — Wine Tasting, 8th Annual Wine Makers Conference-Opener; 14 New Mexico wineries represented plus food prepared with local wines, sponsored by the NM Vine & Wine Society; 5:30-8:30 p.m., Ramada Hotel Classic, 294-6217 or 867-2100.

April 7-8 — Classical Concert Series: "First Lady of the Flute," New Mexico Symphony Orchestra with guest flutist Carol Wincenc and guest conductor Louis Lane (Cleveland Pops), 8:15 p.m., Popejoy Hall, 842-8565.

April 7-8 — Antique show and sale; noon-9 p.m. Fri., noon-8 p.m. Sat.; Albuquerque Convention Center, 268-5122 or 768-4575.

April 7-9 — "Sea Stars," Smithsonian Institution traveling exhibit of star fish, organized by the Monterey Bay Aquarium; 9 a.m.-5 p.m., New Mexico Museum of Natural History, 841-8837.

April 7-15 — "Family Folklore," Smithsonian Institution traveling exhibit; 9 a.m.-9 p.m. Mon.-Thurs., 9 a.m.-5 p.m. Fri.-Sat.; Albuquerque Public Library, 768-5154.

April 7-16 — "A Flea in Her Ear," by Georges Feydeau, New Mexico Repertory Theatre production; mistaken identities, mysterious perfumed letters, and slamming doors send the characters flying about in this turn-of-the-century French farce; 8 p.m. Tues.-Sat., 2 p.m. Sat. & Sun.; KiMo Theatre, 243-4500.

April 7-22 — "Visions of Excellence III," Albuquerque United Artists; noon-6 p.m. daily (except Mon.); Fine Arts Gallery, NM State Fairgrounds, free, 842-8305 or 265-1791.

April 7-May 7 — "Spanish Fly," La Compania de Teatro de Albuquerque interpretation of Machiavelli's romantic comedy "Mandragola"; 8 p.m., Menaul Theatre (301 Menaul NE), 242-7929.

April 7-May 14 — "Centennial Exhibition of Polaroid 20" x 24" Photographs," experimental works by UNM art faculty and invited artists created with the 20" x 24" format Polaroid camera; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues. (gallery talk by Patrick Nagatani April 18, 5:30 p.m.); Van Deren Coke Gallery, UNM Art Museum, 277-4001.

April 7-May 14 — Annual MA/MFA Exhibition: The Centennial Class, UNM Centennial event, annual exhibit of works by graduate studio candidates of MA and MFA degrees in UNM's Dept. of Art and Art History; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues.; upper level galleries, UNM Art Museum, 277-4001.

April 8 — New Mexico Jazz Festival at UNM; 7:30 p.m., Keller Hall, 277-4402.

April 8 — Orchid Show and Sale, 11 a.m.-2 p.m., Albuquerque Garden Center (10120 Lomas NE), free, 296-6020.

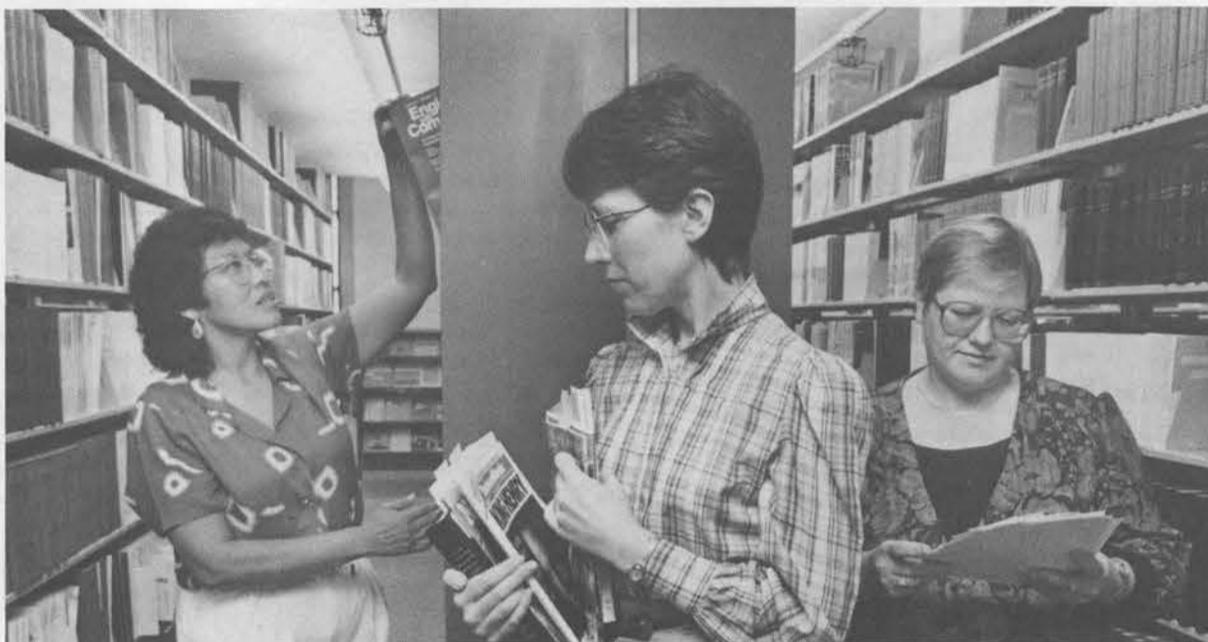
Pitts' Parking — Up for Grabs

A Chance to Learn Some Library Lingo

Among the special events and services planned during National Library Week (April 9-15) to help employees learn more about library operations — and how they can get help from the library — are:

- Behind-the-scenes tours — call 4-6547 if you'd like to join one;
- "What's New" bulletin board in the south corridor, featuring the latest in information technology;
- Information sheet about the library — available at information desk in periodicals wing (southeast corner);

- Open house from 2 to 4 p.m. on Friday, April 14, in periodicals wing: refreshments, demonstration of an optical disk of computer journals, Labs-wide drawing for one month's use of Herb Pitts' (3100) reserved parking space, south of Bldg. 800 near Gate 1. (Sign up for the drawing during the week when you visit the library or at the open house; the winner need not be present at the drawing.)



KEEPING TRACK OF PERIODICALS — all 1700 of them — is no small task, but these three members of Processes Div. 3141 help get the job done. From left, they're Rita Shortman, Dianne Gropper, and Eunice Becker.

April 9 — Jazz Heritage Series: Modern Jazz Quartet; 8 p.m., Popejoy Hall, 277-2131.

April 9 — UNM Chamber Singers, John Clark conducting; 3 p.m., Keller Hall, 277-4402.

April 9 — Canterbury Concert Series: tenor Ross Sutter; 4 p.m., St. Thomas of Canterbury Episcopal Church (425 University NE), 247-2515.

April 10 — Keller Hall Series: faculty chamber music; 8:15 p.m., Keller Hall, 277-4402.

April 12 — UNM Clarinet and Saxophone Ensembles, 8:15 p.m., Keller Hall, free, 277-4402.

April 14 — "Cello & Piano," concert by Anthony Ross, bronze medalist in the 1982 International Tchaikovsky Competition in Moscow; 8:15 p.m., Keller Hall, 277-4402.

April 14-15 — 6th Annual Gathering of Nations Pow Wow: dance competition, arts & crafts market, fun runs and walks, Miss Indian World contest; call for times; University Arena (University & Stadium SE), 836-2810.

April 14-16 — "Ballets de France," Southwest Ballet Company presentation of tale of country mischief and merry maypoles; 8:15 p.m. Fri.-Sat., 2:15 p.m. Sun.; Popejoy Hall, 294-1423.

April 15 — Children's Pillow Concert: Chamber Orchestra of Albuquerque concert-in-the-round featuring music, visuals, movement, and an opportunity to talk with the musicians, designed especially for pre-school through elementary-age children; music by Tchaikovsky, Boyce, Haydn, and Johann Strauss, Jr.; special appearance by Prof. Flora — the Magic Man; 2 p.m., Ramada Hotel Classic ballroom (Louisiana & Menaul NE), bring pillows, 881-0844.

April 16 — Sinfonietta/Choral Series: Choral Fest, New Mexico Symphony Orchestra and Chorus with guest choirs, featuring Thompson's "Americana," Bading's "Trois Chansons Bretonnes," Walton's "Set Me As A Seal Upon Thine Heart," and Hanson's "How Excellent Thy Name"; 3 p.m., First United Methodist Church (4th & Lead SW), 842-8565.

April 16 — UNM Concert Band, Gregory Clemmons

conducting; 3 p.m., Keller Hall, 277-4402.

April 16-17 — UNM Centennial Speakers Series: historian Arthur Schlesinger, Jr., April 16; environmentalist Paul Erlich, April 17; 7:30 p.m., Popejoy Hall, 277-2131.

April 16-30 — "Carthage, A Mosaic of Ancient Tunisia," culture, history, and art from 1st century B.C. to 7th century A.D., more than 300 pieces including large picture mosaics, organized by the American Museum of Natural History in New York; 9 a.m.-5 p.m. Tues.-Fri., 1-5 p.m. Sat.-Sun.; Albuquerque Museum, 242-4600.

April 17 — UNM Concert Chorale, David Poole conducting; 8:15 p.m., Keller Hall, 277-4402.

April 17 — Chamber Music Series #2: New Mexico Symphony Orchestra; 8:15 p.m., First United Methodist Church (4th & Lead SW), 842-8565.

April 21-22 — Laura Dean Dancers and Musicians, 8 p.m., KiMo Theatre, 848-1370.

April 22 — Keller Hall Series: piano concert by Leonard Felberg and Arlette Felberg; 8:15 p.m., Keller Hall, 277-4402.

April 22 — Pops! #4: New Mexico Symphony Orchestra with Michael Martin Murphy; 8:15 p.m., Kiva Auditorium, 843-7657.

April 22-23 — Second Annual Albuquerque Founder's Day: traditional/cultural Hispanic celebration, includes re-enactment of ceremonial proclamation of Albuquerque as a Spanish villa, storytelling, entertainment; call for times, Old Town area, free, 243-3696.

April 22-23 — Cactus & Succulent Society show and sale; 1:30-4 p.m. Sat., 10 a.m.-4 p.m. Sun.; Albuquerque Garden Center (10120 Lomas NE), 296-6020.

April 23 — UNM Opera Studio: one-act operas, scenes, and duets; 4 p.m., Keller Hall, 277-4402.

April 23 — Seattle Mime Theatre, traditional mime plus music, dialogue, and choreography; 2 p.m., KiMo Theatre, 848-1370.

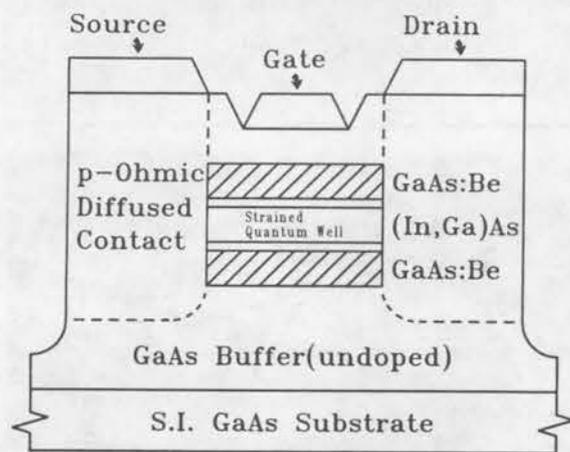
April 23 — Concert, Albuquerque Youth Symphony; 3 p.m., Popejoy Hall, 277-2131.

(Continued from Page One)

Compound Semiconductors

The SQWFET contains a specially tailored quantum well composed of a thin, strained layer of indium gallium arsenide between cladding layers of doped gallium arsenide. Strain is used to tailor the energy band in which the charge carriers move, shaping it in a greater curvature, and giving the carriers

Strained Quantum Well Field-Effect Transistor



a much smaller effective mass. With decreased mass, the carriers are able to move through the material at greater velocity. Speedier movement of charge carriers leads ultimately to faster devices.

Involved in the studies and development of p-channel transistors are Tom Zipperian (1141), Ian Fritz (1143), Jim Schirber (1090), Tom Plut (1141), and former Sandian Tim Drummond (now at the Univ. of Michigan).

Paul also points to Gordon Osbourn's (1145) prediction a few years ago that strain could be used to increase the wavelength at which indium arsenide antimonide/indium antimonide absorbs light: "That was the starting point for the development of infrared detectors that work in the militarily important far-infrared spectral region."

Strained-layer superlattices grown by Ralph Dawson (DMTS) and Bob Biefeld (both 1144) led to the demonstration of detector devices having high sensitivity at wavelengths beyond 10 micrometers. These materials are much more robust than their competitor, mercury cadmium telluride, and much less sensitive to variations in composition, making them attractive for fabricating low-cost IR detector arrays. Tom Zipperian and Steve Kurtz (1163) are processing and characterizing these detectors.

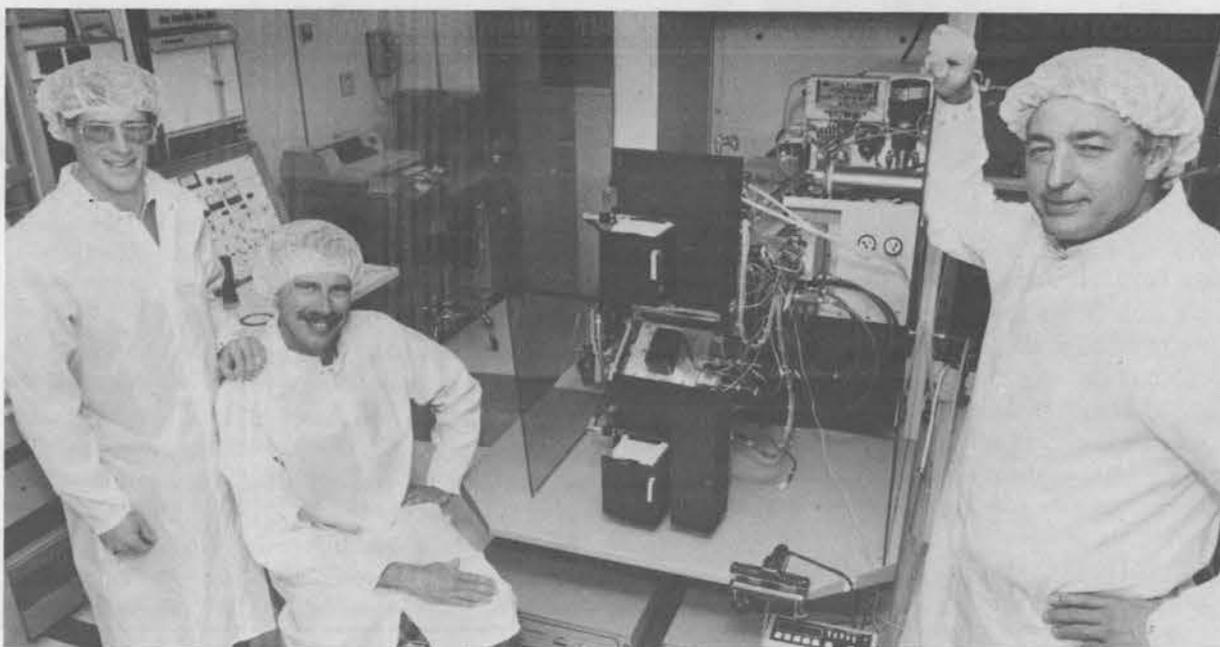
"The clean room — and our collaboration with Solid State Component Dept. 2530 — provide the capabilities we need to grow the materials, fabricate the devices, and optimize them to the point that the technology can be transferred to a manufacturer," says Paul.

Collaborative Development

"Several staff members in 2530 are working with us to develop several devices already demonstrated by research as feasible," notes Paul. "One is a radiation-tolerant, light-activated, high-current switch. It will eventually replace Sandia's radiation-hard photodiode — and a large number of discrete elements that must be used with the photodiode — in optically enhanced firing sets."

Other devices being fabricated: laser arrays with beams that can be electrically steered, strained-layer lasers, surface emitting lasers, optoelectronically tunable mirrors and windows, bistable optical structures, and a variety of high-performance, strained-layer field effect transistors.

"One of our big pushes for the near future," Paul says, "is development of a single optoelectronic integrated circuit that combines many of these devices — lasers, photodetectors, and active electronic devices — on a single compound semiconductor chip. The fabrication difficulties involved will necessarily lead us into what is called 'integrated' processing."



SANDIA'S NEW CLEAN ROOM, recently completed in Bldg. 893, is staffed by Device Research Div. 1141, headed by Harry Weaver (right). Tom Zipperian (left) coordinated its design, and Jay Snelling (seated) is charged with keeping it operational. A high-purity piping system designed and installed by Facilities Directorate 7800 provides a safe, well-monitored environment for clean-room occupants. The room was designed specifically for research. "We wanted to keep the room unencumbered enough to permit flexibility and access for many researchers who might be working on a variety of projects," says Harry. The 400-kilovolt ion implanter (shown) and rapid thermal-annealing systems provide techniques for processing a variety of novel devices. In addition to equipment for epitaxial growth, the room includes a collection of electron-beam evaporators, sputter deposition systems, and plasma units for depositing metal and insulator films. "We're developing dry etching and ion-beam-assisted etching techniques to support the fabrication of integrated circuits," notes Harry. "Our optical contact aligners currently allow lithographic printing of one-micron features — but we'll be extending this to below a tenth of a micron with a new electron-beam exposure system."

In integrated processing, several sequential processing steps, such as electrical doping, patterning, and contact formation, are carried out without removing the wafer from the controlled environment of the growth and processing chamber.

Strange New World

Another future direction, Paul says, involves "quantum" structures. This is a realm of microelectronics where researchers dream of a computer-on-a-chip that has transistors only a few atoms across, where billions — compared to today's several millions — of transistors could be packed onto one chip,

and where electrons flit back and forth between being a dot of solid matter and an incorporeal field of energy.

"This is a very exciting future prospect for artificially structured materials — we already frequently use the quantum-well aspects of structures, where the electrons are confined in layers only a few atoms thick," says Paul.

"Our current structures confine electrons in only one dimension, but structures are being built that confine electrons in two — or even three — dimensions. These quantum 'wires' and 'boxes' are expected to have very interesting effects on the electrical and

(Continued on Next Page)

State of US Optoelectronics Industry

Optoelectronics is a branch of "photonics" concerned with the use of light (photons) to work with or to replace electrons in certain applications traditionally carried out by electrons. It's a well-established key technology in long-distance fiber-optic telecommunications, for example, and is growing rapidly in other important fields: information processing, computer data storage, and various classes of sensors.

Optoelectronic devices emit, modulate, transmit, or sense light. This emerging technology relies on compound semiconductors because these materials absorb and emit light efficiently. Japanese laboratories are reportedly far ahead of US laboratories in the development of processing and manufacturing capabilities for these materials.

One of the goals in this new technology is to create a new class of devices in which optical and electrical components are integrated onto a single chip. A single optoelectronic integrated circuit, for example, might combine lasers, photodetectors, and active electronic devices such as amplifiers and modulators onto a single gallium arsenide chip.

For these devices, which will require extremely complex compound semiconductors, the difficult processing problems can be solved only by the most sophisticated techniques. Again, the US has been surpassed by Japan. The Japanese are already developing innovative approaches of integrating sequential processing steps into one ultrahigh vacuum processing system to fabricate

complete structures. There is no comparable experimental effort in the US.

A 1987 National Research Council workshop, "Photonics: Maintaining Competitiveness in the Information Era," co-chaired by VP Venky Narayanamurti (1000), assessed the science and technology base for photonics in the US. Noting that the US pioneered most photonic technologies, the workshop panel pointed out that the US has been soundly beaten by the Japanese in the race to commercialize them. The US, said the panel's report, has been "a leader in research and invention but is already a follower — or worse, an observer — in developing many of the commercial products of the field."

"Photonics," says Venky, "is generally viewed as one of the key technologies of the information age. Because fields such as optical signal processing, storage, and communications also have considerable potential for military application, photonics must be viewed as strategically important both commercially and militarily. The National Research Council panel has strongly recommended the formation of national centers involving the collaboration of industry, national laboratories, and universities to emphasize the manufacturing problems of photonic devices and systems.

"Sandia's role in the formation of the Center for Compound Semiconductor Technology could evolve naturally into a national photonics center or project," he notes.

Sandia Helping US "Chip Away" at Japan's Semiconductor Processing Lead

US leadership in semiconductor production has been lost to Japan.

That's the theme that runs through reports issued in the last few years by the National Research Council (established by the National Academy of Sciences) and the Defense Science Board (a Pentagon study group).

Figures bear it out. In 1980, the US had a 64-percent share of the world semiconductor market. In 1988, a preliminary survey shows that the US share had slipped to 37 percent.

What's more, according to these reports, Japan has also taken an early lead in developing key emerging technologies essential to the fabrication of the next generation of microelectronics — compound semiconductors and optoelectronics.

The concern is that, in addition to losing its once-dominant position in the production of traditional

In 1980, the US had a 64-percent share of the world semiconductor market. It's now about 37 percent. Japan's share is about 50 percent.

silicon semiconductors, the US will fail to even gain a competitive position in these leading-edge electronics and, consequently, in other rapidly evolving areas of science and technology crucial to the country's economic well-being and national defense.

Recognizing that "the countries that develop and use high technology in their industries will control the world economy" and that the US "has seen its lead in high technology slip in many fields," the National Research Council has urged the formation of industry/university/national laboratory ventures that would focus on the manufacturing problems of compound semiconductor and optoelectronic devices and systems.

Sandia's CCST Will Help

Sandia's Center for Compound Semiconductor Technology (CCST), which is partially funded by a \$10 million grant administered through DARPA (Defense Advanced Research Project Agency), will help maintain a strong US effort in compound semiconductor and optoelectronics technology, says Paul Percy (1140), who directs the Center.

"Compound semiconductor devices will underlie next-generation microelectronics and optoelectronics," he says. "Devices of this kind are already being installed in weapon systems that Sandia develops and will become increasingly important. It's vital to the nation's defense that the US maintain a strong

capability in compound semiconductor technology and that Sandia have access to that capability."

The DoD recently included compound semiconductors, optoelectronics, and fiber optics on the list of 22 technologies considered critically important to defense.

"The new clean room, which we've just completed as part of the CCST," Paul continues, "is a state-of-the-art facility that will allow us to increase our already strong interactions with scientists and engineers in universities and industry." (See "Compound Semiconductor R&D . . .")

Slide Began in Early 80s

The US's loss of leadership in semiconductor technology didn't happen overnight.

In a 1985 report, *Advanced Processing of Electronic Materials in the United States and Japan*, the National Research Council warned that the overall competitiveness of the US in electronics had worsened dramatically in the five years since 1980. "We are losing the leadership to Japan," said the report.

Walter Bauer, manager of Physical Research Dept. 8340, chaired the National Research Council panel that produced the report. Tom Picraux, manager of Ion Implantation and Radiation Physics Research Dept. 1110, was a panel member.

The panel cautioned that the loss of leadership would have significant consequences for the economic well-being of the US:

Semiconductors are key to competitive production in many large industries such as computers, telecommunications, transportation, and medical equipment. Dependence on foreign sources for low-cost, high-quality chips can have pervasive downstream economic effects in terms of lost jobs, lost opportunities, and a worsening quality of life for Americans.

The panel noted that many factors — technical, managerial, organizational, and economic — were contributing to the decline of the US semiconductor industry. But the primary cause, it said, was the decrease in long-range research and development on the part of US companies, especially in advanced processing techniques essential for fabricating current and next generation electronic materials and structures.

In the panel's assessment, the US must either aggressively pursue these advanced processing technologies — or become "dependent on others for the advanced electronic devices that fuel computer technology, the communications industry, and advanced defense systems."

The National Research Council panel's ominous assessment was echoed by a task force set up in 1986 by the Defense Science Board:

US military forces depend heavily on technological superiority. . . . The DoD's ability to procure advanced semiconductors depends on the continued ability of the domestic commercial sector to produce leading-edge devices. . . . Reliance on second-rate or foreign products is unacceptable.

Going, Going . . .

Between 1980 and 1985, the US share of the \$28 billion world market for semiconductors dropped from 64 to 53 percent (National Research Council report). The decline has continued — at an accelerated pace.

The Defense Science Board also declared in 1986 that, out of 25 semiconductor products or processes, Japan was leading in 12 while the US was leading in five, with parity in the other eight. It also indicated that the US position relative to Japan was continuing to decline in 19 of the 25 categories, including four of the five in which the US had led — the US was not gaining in any category.

Predictably, in 1988, Japanese semiconductor

manufacturers laid claim to a full 50 percent of the worldwide market, and the US share slipped to 37 percent (preliminary 1988 market-share survey by Dataquest, a research firm).

Solutions Sought

The precipitous decline and loss of leadership prompted the National Research Council to sponsor several workshops to explore the problem.

The first workshop, "The Semiconductor Industry and the National Laboratories" (February 1987), included high-level representatives from the semiconductor industry, national laboratories, federal agencies, and Congress. They agreed that the semiconductor industry problems represented a national

The US has been "a leader in research and invention, but is already a follower — or worse, an observer — in developing . . . commercial products . . ."

crisis that required a coherent national action program, one that would combine and coordinate the resources of the semiconductor industry and the national laboratories in a cooperative effort to restore competitiveness.

(Former Sandia Research VP Bill Brinkman, now Executive Director of Research at AT&T Bell Labs, was a member of the steering group for the National Research Council panel; Fred Vook, Director of Solid State Sciences 1100, former VP Larry Anderson, and Bob Gregory (ret.) participated in the workshop.)

A second workshop, "The Semiconductor Industry and the National Laboratories: Continuing the Joint Planning," was hosted by Sandia in May 1987. It identified specific areas of research needed by the semiconductor industry and relevant research capabilities within the national laboratories that could address those needs. This restricted-attendance meeting was the first in which the technical capabilities of the national labs and the technological "road maps" of the US semiconductor industry were shared.

(The workshop was organized by Fred Vook, Bob Gregory, and Paul Percy. One of its important results: Sandia became a key participant in the strategic-planning workshops held later by SEMATECH, establishing a closer relationship between the Labs and semiconductor industry leaders.)

National Action Program

During this period, two major initiatives to help restore competitiveness to the US's traditional silicon semiconductor industry were launched — one by the Defense Science Board, which issued a report calling for the establishment of a Semiconductor Manufacturing Technology Institute, the other by the Semiconductor Industries Association, which independently — but almost simultaneously — launched the initiative known as SEMATECH (SEmiconductor MANufacturing TECHnology).

An industry consortium funded by its members and matched by a \$100 million appropriation from Congress for the first year, SEMATECH's purpose is to develop the manufacturing technologies that individual companies can no longer afford to develop. It will also demonstrate those technologies by limited manufacture of advanced silicon chips.

Minor differences between these two initiatives have been worked out sufficiently so that SEMATECH — now gearing up in Austin, Tex. — forms the core of the national effort to regain US competitiveness in silicon semiconductors.

Several government/industry initiatives are under way to establish similar consortia in optoelectronics. ●DR

(Continued from Preceding Page)

Compound Semiconductors

optical properties. They'll certainly be the *ultimate* in miniaturization — when we learn to process and control them."

In the realm of quantum electronics, element sizes begin below 0.01 micrometer. Distances then get so infinitesimal that researchers measure them in angstrom units — 0.1 billionth of a meter — units so small most of us can't even visualize them. (*Business Week* recently offered this help: If a grain of salt were as tall as Chicago's Sears Tower, one angstrom would be about as thick as a sheet of paper.)

This is an area, says Paul, "that offers exciting possibilities for devices that function in a fundamentally different manner from conventional electronic and optoelectronic devices." ●DR

Supervisory Appointments



MELODIE OWEN to manager of Accounting Dept. 150, effective Feb. 16.

Melodie joined Sandia's General Accounting Division in June 1979. She's worked in the Financial Policies and Procedures, Gross Receipts Tax, and Management Information and Results divisions. She was promoted to supervisor of the Payment Processing Section in 1984, and then to the Financial Division in 1985. In February 1987, she became Assistant to Vice-President 1000.

She has a BBA and an MBA in accounting from Eastern New Mexico University and holds a CPA certificate. She worked for an Albuquerque CPA firm before joining the Labs. She's a member and past president of the New Mexico Chapter of the American Society of Women Accountants.

Melodie's spare-time activities include tennis, ballroom dancing, and aerobics. She lives in the NE Heights.

* * *

DEL OWYOUNG to manager of Optoelectronics and Microsensor Research Dept. 1160, effective March 1.

Del joined Sandia's Advanced Laser and Optoelectronic Technologies Division in January 1972, and was appointed supervisor of that division in August 1981. His early work was on nonlinear effects in laser materials and nonlinear spectroscopic techniques. Recent work includes research on laser arrays, miniature solid-state lasers, and optical spectroscopy of semiconductor superlattices.

He has a BS in electrical engineering from the University of California at Berkeley and an MS and PhD in EE and physics from the California Institute of Technology. He's a member of the Optical Society of America.

Del's leisure-time interests include tennis, bicycling, reading, and church activities. He and his wife Helen have four children and live in NE Albuquerque.

RONALD LOEHMAN to manager of Chemistry and Ceramics Dept. 1840, effective Dec. 16.

Ron joined the Labs in February 1982 as a member of the Ceramics Development Division, where he performed basic research on glass ceramic-to-metal seals and glass crystallization. He first worked at Sandia in 1977-78, on sabbatical leave from his job as associate professor of ceramics at the University of Florida. Ron was named supervisor of the Electronic Ceramics Division in March 1986.

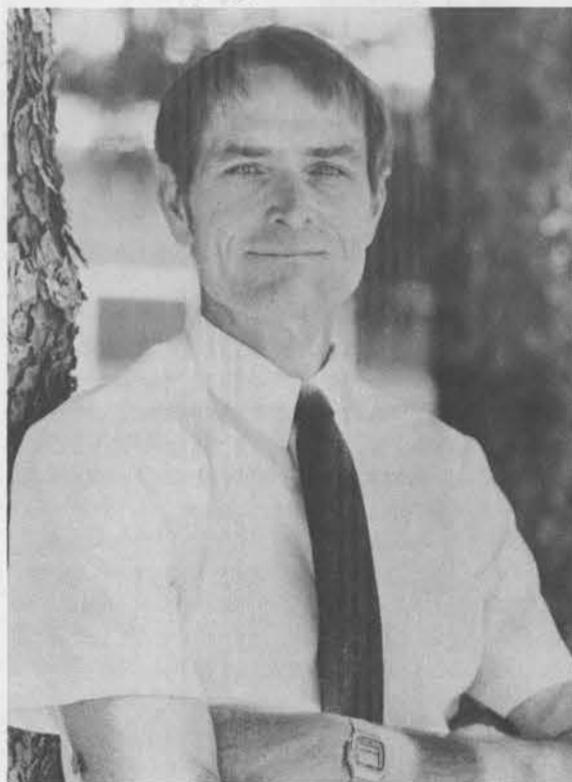
He has a BA in chemistry from Rice University and a PhD in solid-state chemistry from Purdue. He's a fellow of the American Ceramic Society and an associate editor of the society's journal. In 1988, he was awarded the ACS Fulrath award for his research on ceramic-metal joining.

Ron's spare-time activities include racquetball, bicycling, and native-plant gardening. He and his wife Ellen have three children and live in the NE Heights.

* * *

GERALD QUINLAN to supervisor of Systems Development Div. 2821, effective Dec. 16.

Gerry joined the Labs in June 1969 as a member of the Administrative Systems Division, where he did computing applications and provided tech-



nical support. He was a systems programmer for the IBM-360 and Univac-1108 and was project leader for technical support on the Univac-1108, Unisys 1100/82, and ADNET. He transferred to the design engineering organization's Systems Development Division in 1987.

He has a BA in math and an MS in computer science, both from Texas A&M. He's a member of the National Systems Programmers Association.

Gerry's spare-time activities include golf, running, and judging entries at state and regional science fairs. He and his wife Beverly have two children and live in the NE Heights.



JEFFREY PHILBIN to supervisor of Nuclear Facility Safety and Development Div. 6453, effective Feb. 16.

Jeff joined the Labs in December 1970 as a member of the Reactor Applications Division, where he performed reactor safety analyses and characterized kinetics and output characteristics of Sandia's pulse reactors.

He transferred to the Experimental Systems Design Division in 1975, where he designed upgrades to research reactors and developed advanced reactor design concepts. Jeff joined the Waste Management Systems Division in 1985, performing research on storage casks for spent nuclear fuel and on economic risk of nuclear material operations.

He has a BS in mechanical engineering from Notre Dame, an MS in nuclear engineering from Northwestern, where he was a National Science Foundation Fellow, and a PhD in the same field from the University of Illinois, where he was an Atomic Energy Commission Fellow.

He is a member of the American Nuclear Society and is past-president of the local section.

In his spare time, Jeff enjoys golf, reading, PC applications for business and investments, and playing the piano.

He and his wife Marge have two children and live in the NE Heights.



DORIS JACKSON to supervisor of Computer Art and Graphic Design Section 3155-2, effective March 1.

Doris joined the Labs in November 1966 as a secretary in the Aerospace Material Science Division. She left Sandia in 1969 and returned in February 1976 as secretary in the Light Water Reactor Safety Division. She was promoted to department secretary in September 1977. She transferred to the Future Options Group in December 1982, then to the Technical Art Department in April 1984 as a computer illustrator.

She attended the University of California, Berkeley, and has taken art courses since 1980. She was a legal secretary before coming to Sandia.

In her spare time, Doris enjoys Lobo basketball and painting in oils, water color, and pastels. She has two grown children and lives in the NE Heights.

DEL OWYOUNG (1160) and
RON LOEHMAN (1840)



Supervisory Appointments

JOSEPH KERR to supervisor of Accelerated Procurement Systems Div. 3741, effective Feb. 16.

Joe joined Sandia's Purchasing organization in February 1979 as a buyer of microelectronic components and telemetry systems. He was a buyer in various Purchasing divisions until March 1984, when he was promoted to supervisor of the Machining and Fabrication Purchasing Section. He served as the Purchasing Functional Representative for the Simulation Technology Lab project. From April 1988 until his promotion, Joe was a contracting representative in Purchasing Div. 3716, which provides project procurement support for Nuclear Security Systems Org. 5200.

He has a BS in business administration from the University of Albuquerque, an MA in business from New Mexico Highlands University, and is a National Assn. of Purchasing Management Certified Purchasing Manager.

Joe worked for General Electric's Aircraft Engine Group before joining the Labs. He's a member of the Purchasing Management Assn. of New Mexico and the National Contract Management Assn.

His spare-time activities include fishing, camping, and boating. He and his wife Cleo (4000) have one son and live in the NE Heights.



JOE KERR (3741)

ROD GEER to supervisor of Community Relations Div. 3163, effective April 1.

Rod worked in the Public Information Division as an information specialist from 1976 to 1987, when he became administrative assistant to Director of Solid State Sciences 1100. Rod returned to Public Information in August 1988, where he helped prepare Sandia's Technology Transfer State Fair exhibit and coordinated the recent LAB NEWS energy series.

Before joining the Labs, Rod was manager of UNM's News Bureau and a reporter for the *Albuquerque Tribune*. He has a BA in journalism/radio/television from UNM. He's a member of the Public Relations Society of America.

Rod enjoys family activities and assisting with youth soccer in his spare time. He and his wife Maria have two daughters and live in NE Albuquerque.

* * *

LARRY PERRINE to supervisor of Employee Communications Div. 3162, effective March 1.

The new editor of the LAB NEWS joined Sandia's Technical Writing Division in January 1983 and was assigned to the Nuclear Waste Repository Technology Department. In January 1986, he transferred to the Public Information Division, where he did science writing, handled media relations, and edited *Sandia Science News*. Larry joined the Div. 3162 staff as a writer in September 1988.

He earned a BS in advertising and journalistic management from Oklahoma State University and an MS in journalism from Kansas State University. Before coming to the Labs, Larry worked for an energy consulting firm in Bartlesville, Okla., and before that for Texas A&M University.

In his spare time, Larry enjoys skiing, fishing, and nature and scenic photography. He and his wife Deanna have two children and live in the NE Heights.



BILL HENDRICK (7843) and TONY CHAVEZ (7814)

WILLIAM HENDRICK to supervisor of Engineering Div. III 7843, effective Jan. 1.

Bill has been a member of Sandia's Facilities organization since joining Facilities Design Division II in April 1977. He worked in architectural and structural engineering design and, besides working on building additions and renovations, helped design Bldgs. 855, 857, 858, 890, and 891.

He has a BS and MS in civil engineering, both from the University of Oklahoma. He is a New Mexico registered professional engineer.

Bill's spare-time activities include woodworking, softball, and skiing. He and his wife Cindy have three children and live in the NE Heights.

* * *

MICHAEL NIELSEN to manager of Facilities Operations and Maintenance Dept. 7810, effective Feb. 16.

Mike has been with Sandia's Facilities Management Department since he joined the Labs in July 1969 as a design engineer. His work has included design, operations, and planning work for construction programs and facilities modifications. He worked for two years on the Waste Isolation Pilot Project.

In January 1982, he was appointed supervisor of the Facilities Planning Division, which helped develop Sandia's Master Site Development Plan.

Mike has a BS in electrical engineering from California Polytechnic State University and has done graduate work in nuclear engineering at UNM.

His spare-time activities include camping, fishing, and skiing. Mike and his wife Susan Gaye have two children and live in NE Albuquerque.

* * *

LELAND BYERS to supervisor of Micrographics and Reprographics Div. 2832, effective Jan. 1.

Lee has been in the Design Definition organization since he joined the Labs in July 1967 as a designer. His work has been with computer-aided design (CAD) and applications, solid model evaluation, project analysis on the Access, Control, and Release System, and in information systems.

He has an AS in drafting and design from Pennsylvania State. He has attended UNM, and Sandia's

CAD training and Out-of-Hours classes.

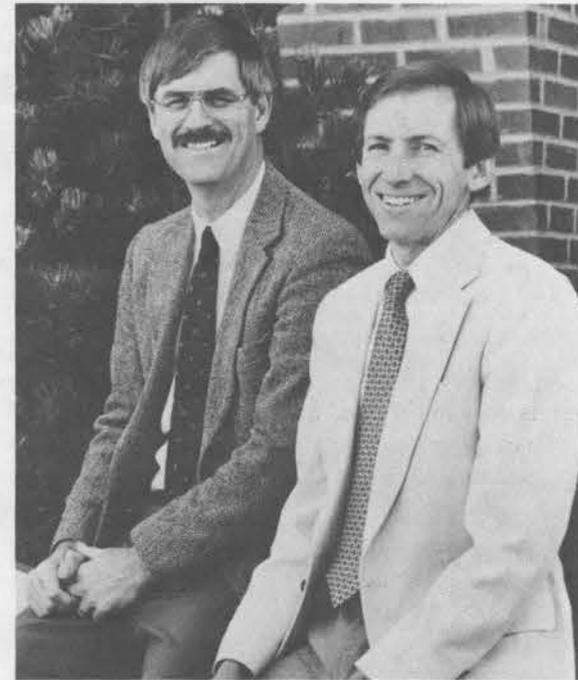
Lee's spare-time activities include tennis, running, basketball, soccer, and reading. He and his wife Viola have four children and live in the NE Heights.

* * *

ANTONIO CHAVEZ to supervisor of Facilities Operations Div. II 7814, effective Jan. 1.

Tony joined Sandia as a mechanical apprentice in November 1970. When he completed the apprentice program in 1975, he was assigned to the Facilities Operations Division, where he worked as a refrigeration mechanic. He became a standards analyst in the Maintenance Operations Planning Division in 1978. In 1979, he was named supervisor of the Zone D Operations Section.

Tony is active in Little League baseball and the Young American Football League. He's a member of Disabled American Veterans (DAV). In his spare time, he enjoys hunting, fishing, and other outdoor activities. He and his wife Lolly have two sons and live on the West Mesa.



MIKE NIELSEN (7810) and LEE BYERS 2832



ROD GEER (3163) and LARRY PERRINE (3162)

VanDevender and Schaefer Named American Physical Society Fellows

Two more Sandians have been elected Fellows of the American Physical Society (APS). Pace VanDevender, Director of Pulsed Power Sciences (1200), and Dale Schaefer, manager of Organic and Electronic Materials Dept. 1810, are the second and third Sandians elected this year. Jim Gerardo, manager of Laser and Chemical Physics Research Dept. 1120 was named an APS Fellow earlier (LAB NEWS, Jan. 27, 1989).

The American Physical Society designates as Fellows only APS members who have "contributed to the advancement of physics by independent, orig-



NEW AMERICAN PHYSICAL SOCIETY FELLOW Dale Schaefer (1810).

inal research, or who have rendered some other special service to the cause of the sciences."

Dale was cited by the APS for "experiments on the structures and dynamics of complex fluids and for studies of fractal structures in varied condensed matter systems."

His recent work centers on applying the concept of fractal geometry to understanding the structure and properties of disordered materials, including polymers, glasses, composites, aerosols, surfactants, and colloids.

Dale received his PhD in physical chemistry from the Massachusetts Institute of Technology in 1968. After doing post-doctoral work at MIT and at IBM, he joined Sandia as a technical staff member in 1972 and used light-scattering techniques to probe the dynamics of dense colloid and polymer solutions.

He supervised the Corrosion Division from 1980 to 1982 and the Chemical Physics Division from 1982 until this year, when he became a department manager.

Pace was cited for "technical leadership in inertial confinement fusion with light ion beams, pulsed power accelerator design and research, magnetically insulated electron flow, vacuum interface flashover, and beam-plasma heating."

He has been Sandia's Pulsed Power Sciences Director since 1984. Work under his direction covers pulsed power R&D, inertial confinement fusion, nuclear weapon effects simulation, and directed-



NEW AMERICAN PHYSICAL SOCIETY FELLOW Pace VanDevender (1200) in high bay at Sandia's Particle Beam Fusion Accelerator II.

energy weapon R&D. He is Sandia's designated spokesman for Strategic Defense Initiative projects.

Pace has worked in pulsed power and fusion research since joining Sandia in 1974 after receiving his PhD in physics from the Imperial College of Science & Technology at the University of London. Before assuming his current position, Pace served in two other Sandia administrative positions — supervisor of Pulsed Power Research and manager of Fusion Research.

Retiring



Donn Stewart (7471) 24



Jim Bear (7535) 30



Vester Harker (5219) 24



Walter Hyde (5249) 37



John Hall (7816) 26



Jose Romero (7818) 19



Dorothy Hall (3500) 25



Mac Weaver (9145) 32



Silviano Chacon (2541) 26



Howard Austin (7126) 43



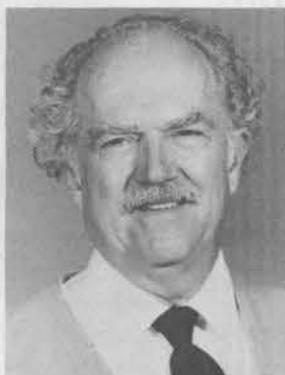
HEY, SAILORS! — Bill's going again, and he's looking for folks who want to sail along. Bill Horton (DOE ret.) plans to sail the Caribbean again this fall, something he and his mate have done for the past seven years. He offers a series of one-week, hands-on sailing adventures for novice and experienced sailors. He cruises the Virgin Islands or the waters from St. Lucia to Grenada. Bill can take four passengers each week on the 45-ft. yacht that he charts in the islands. It's not a money-making venture, Bill says — he just loves sailing and charges enough to meet expenses. Many of his fellow sailors over the years have been Sandians and their mates. For details, call Bill on 883-7504.



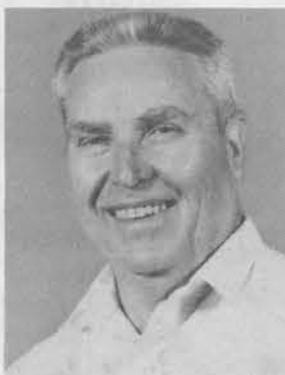
John Williams (3734) 30



Keith Mead (5128) 38



Roy Williams (1264) 34



Lyle Hake (7132) 40

Take Note

A call for papers has been made for the 7th Symposium on Space Nuclear-Power Systems, Jan. 7-11, 1990, in Albuquerque. Papers are invited on all engineering, research, and utilization aspects of space nuclear-power systems. Four-to-six-page summaries, submitted for review by the Technical Program Committee by June 13, should explain significant results that will be presented. Address summaries to Prof. Mohamed El-Genk, 7th Symposium Summaries, Institute for Space Nuclear-Power Studies, UNM, Albuquerque, NM 87131.



BRUCE TWINING (right), manager of DOE/AL, presented DOE's Distinguished Associate Award to retiring Sandia President Irwin Welber at his farewell open house March 30. The award recognized Irwin's "outstanding contributions to the Department of Energy's national security and energy objectives."

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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.

MISCELLANEOUS

SPRINGER SPANIEL, AKC-registered, 17 months old, obedience-trained, \$150. Buttz, 822-1448.

WHEELS, for Chev. pickup, 8-hole, 9.50/16.5, \$20/ea., or 3 for \$50; Chinook camper, 11', slide-in, \$1495. Dorsch, 884-1405.

SPINET PIANO, Winter, \$600. Jones, 881-6006.

SLINGERLAND SNARE DRUM, metallic blue, w/stand, \$75 OBO. Misak, 892-3033.

LAWN MOWER, 3-hp, 20" side grass-catcher, \$50 OBO; lawn spreader, \$10. Russell, 281-1289.

SANDIA T-SHIRTS, \$7; Sandia caps, \$7. South 14 Village Project, LAB NEWS, Bldg. 814.

PICKET FENCING, 50', 3" x 5', needs painting, \$25. Wright, 256-9210.

DOUBLE DRESSER, \$75; expandable buffet table, \$200; solid walnut coffee table, \$150; glider, \$60; console sewing machine, \$95. Gaitner, 298-1043.

UPRIGHT FREEZER, 16 cu. ft., Whirlpool, \$125. Bentz, 292-2544.

CUSTOM TOPPER CAMPER SHELL, for SWB Chev., blue w/white trim, \$350. May, 836-3842.

PAMPAS GRASS, free, you dig. Chorley, 296-1454.

DROP-LEAF TABLE, solid walnut, extends to 44" x 100" w/2 leaves, four cane-back chairs w/black Naugahyde seats, \$350. Caffey, 296-1942.

KIRBY HERITAGE VACUUM CLEANER, w/attachments, make offer. Sorrell, 292-0874.

OLIVETTI PR2300 PRINTER, IBM-compatible, parallel interface, non-impact bi-directional dot matrix, 50 lines/minute w/graphics, \$100. Chavez, 275-0490.

OVATION CLASSICAL ACOUSTIC ELECTRIC GUITAR, 6-string, w/hard-shell case, \$600; Lyle acoustic guitar, 6-string, rosewood sides and back, \$400. Gilbert, 294-3772.

DOUBLE CRYPTS, slide-over, Sunset Mausoleum, chapel addition. Carnohan, 1-894-7260.

AT&T 6300 PC, mono/color monitors, 640K RAM, 20MB hard disk, 360K floppy, keyboard, cover, manuals, \$1400. Thomas, 293-0681.

LAWN MOWER, 3-hp, 22" electric, rear bag, used one season, \$75. Wayland, 299-2587.

TRUNDLE BED, mattresses, lower bunk, \$175; electric typewriter, Sears Graduate w/correction key, \$75. Hernandez, 266-5395.

BROYHILL LOVE SEAT, cotton velvet, light green, 64", \$100. Hunter, 293-8707.

CRAFTSMAN LAWN MOWER, electric; bra for '85 Subaru XT coupe. Gonzales, 266-2302.

SEWING-MACHINE CABINET, wood w/medium-brown stain. Ginn, 296-6548.

ONE ROUND-TRIP TICKET TO AUSTIN, leave Albuquerque April 14 (evening), return April 16, \$60 OBO. Chao, 268-3661.

ROCKING CHAIR, Carolina white oak, spindle-style, medium-dark finish, \$50; wicker love seat, white, \$15. Hollister, 296-8055.

EXERCISE BIKE, 25 miles, \$40 firm. Meirans, 298-4738.

'83 KIT ROAD RANGER TRAVEL TRAILER, 19-1/2 ft., self-contained, extras, \$5000. Yingst, 884-3812.

IBANEZ GUITAR, George Benson model w/flight case. Foty, 268-0412.

TWO BALL PYTHONS, \$75/ea. OBO; Browning .22-cal. pistol, semi-automatic, stainless Challenger III, 2 clips, case, \$150 OBO. DiMarzio, 291-9225.

TREADMILL, manual, heavy-duty, stainless-steel rollers, w/odometer, \$100. Johnson, 299-5459.

WASHER AND DRYER, Montgomery Ward, 4 months old, \$400/set; microwave, \$150. Brandt, 275-1059 leave message.

FENDER AMP, 150-watt w/two 6" column speakers, \$450; trumpet w/case, \$80. Trujillo, 865-0253.

APPLE II+ COMPUTER, 64K, CPM, Grappler+, 80-column, monitor, 2 drives w/software and documentation, \$500. Blend, 892-2496.

SIX-PIECE LIVING-ROOM FURNITURE SET, German-made, \$1000 OBO; cat and dog, free. Keith, 897-1976 after 5.

FOUR TICKETS, for April 21 Neil Diamond concert in Phoenix, \$20.65/ea. Moya, 296-8824.

WHITE'S LAWN AND GARDEN TRACTOR, 10-hp, electric start, mower, plow, and disk, \$2000 OBO. Greving, 831-6015.

BATHTUB SURROUND, almond, 54" tall, new in box, \$20. Morris, 292-5112.

BROWNING 12-GA. BPS, new in box, \$350. Zownir, 256-3753.

GARAGE DOOR, 7' x 8'. Coulter, 275-2183.

ELECTRIC FUEL PUMP, new, fits VW Rabbit, Dasher, Fox from '77 thru '81, cost \$90, sell for \$30 OBO. Garcia, 293-3937.

STROLLER BED. Liguori, 256-3613.

LA-Z-BOY RECLINER ROCKER, gold fabric, vinyl arms, \$75; Everlast training bag, canvas, 70-lb. chains, swivels, \$30. Dunlap, 884-0232.

ANTIQUE OAK TABLE, 44" square, fluted legs, w/2 leaves, \$600. Stublefield, 296-7733.

LAWN MOWER, Briggs & Stratton 3-hp, 19", no catcher; push mower, \$20. Meyer-Hagen, 293-7339.

DOG TRAVEL KENNEL, 25" x 35" x 24", \$30. Underhill, 294-5774 after 5.

SHAG RUG, w/pad, 12' x 26', brown/beige/white/yellow mix, \$100. Hernandez, 268-5000.

SEARS LIFESTYLER ROWING MACHINE, \$85; projector screen, \$20 OBO; Rocket aluminum wheels, 14", 4-hole, w/used tires, \$100 firm. Golightly, 293-5987.

OAK MICROWAVE STAND, w/storage & butcher-block counter, cost \$270,

sell for \$135. Clark, 292-1495.

WOMAN'S TIMEX WRISTWATCH, new, quartz-operated, goldtone bracelet, \$22.50. Burstein, 821-6688 after 5:30.

CROWN GRAPHIC CAMERA, 4 x 5; 13.5-cu.-ft. refrigerator; kitchen cabinets; 20" electric range; countertop, double sink, wall deco. Burke, 299-2793.

KITCHEN TABLE, yellow formica top, chrome legs, 4 cushion chairs; lawn furniture, green, 2 chairs, 2 loungers. Kindschi, 256-0531.

PROM DRESSES: 6 floor-length formals, sizes 9 to 13, \$15 to \$25/ea. Keltner, 298-7888.

COACHMAN 10' TRAILER, front kitchen, sleeps 5, self-contained, furnace, shower, hot water, refrig., built-in jacks, \$2900 OBO. Cook, 869-6921.

TAILGATE, for '76 Chev. pickup, fits '77 to '80, \$60. Zamora, 865-6280.

GENERATOR, Honda EX-1000, 1-kW, 115 VAC and 12 VDC outputs, used one season, \$450. Tucker, 869-3469.

'67 MERCURY FUEL PUMP, trans. kit and F fluid; '81 Ford manuals (8); trans. kit C4 B-31, negotiable. Roberts, 255-9527 p.m.

COMMODORE 64 COMPUTER, w/disk drive, cassette drive, joy stick and misc. software, \$250 OBO. Howard, 839-9203.

TRANSPORTATION

BMX BICYCLES, need work, w/parts and accessories, \$30 to \$50 OBO. Holmes, 897-0916.

ALUMINUM JOHN BOAT, 14', \$225; '67 Mustang, 289 engine, \$2200 firm. Rhoden, 293-5301.

'83 DATSUN PICKUP, std. bed, liner, 4-spd., radials, snow tires, recently tuned, \$2300. Tebo, 897-0403 leave message.

TWO PANWORLD MEN'S 10-SPD. BIKES: Olympian and Mark IIA models, lightweight frames, \$80 each. French, 865-3686.

'73 GLASTON BOAT, open hull, '84 Mercury 115, E-Z Rider trailer. Ross, 821-6366.

'78 FIAT X/19 CONVERTIBLE, gold, needs clutch, \$1050 OBO; '73 Opel Manta parts. Garcia, 888-4735.

'84 CADILLAC SEDAN De VILLE, 49.3K miles, \$9000. Kerby, 823-9211.

'81 SUZUKI 450T, 11K miles, windscreen, mag wheels, rack, \$450 OBO. Hueter, 299-7263.

'86 FORD SUPERCAB PICKUP, F-250, 4x4, AC, cap, storage compartments, extras. Gasser, 299-2199.

'86 BMW R80, matched fairing, factory bags, progressive fork springs, braided-steel brake lines. Rasmussen, 836-5513.

BICYCLE, BMX Ironman dirt bike, silver, pads, \$70. Snyder, 296-5771.

'68 CHEV. C-10 PICKUP, \$600. Gilbert, 294-3772.

'84 SHASTA 3000 MOTORHOME, 32K miles, power everything, 2 roof ACs, extras. Carnohan, 1-894-7260.

'84 YAMAHA FJ1100, 5K miles, Vance & Hines, Dynojet, custom parts, \$2750. Baca, 298-7748.

'77 CRUISE MASTER MOTORHOME, roof and dash ACs, plus evaporative cooler, rear bath, 45K miles, \$9500. Patterson, 299-1062.

SEA RAY BOAT, 19', w/trailer, loaded, \$10,000. Crowley, 898-7646.

'82 HONDA CIVIC, 4-dr., AC, 5-spd., AM/FM, 48.5K miles, one owner, \$2300. Norris, 299-4717.

GIRL'S SCHWINN BICYCLE, 20", Stingray, pink w/banana seat. Wagner,

823-9323.

'71 TRIUMPH SPITFIRE, \$2700 OBO. Keith, 897-1976 after 5.

'75 FORD MAVERICK, 62K miles, 4-dr., AT, air shocks, trailer hitch, AM/FM radio. Adkins, 294-8735.

'78 HONDA CX-500, fairing, \$750. Babicz, 299-5938.

'87 MAZDA RX7, red w/black bra, 12.5K miles, \$12,500. Hovorka, 296-0340.

'80 YAMAHA 650, 20K miles, new seat and battery, \$900. Blend, 892-2496.

'82 SUZUKI GS850GZ, 14K miles, black & gold w/matching fairing and bags, new tires & battery, \$2100 OBO. Greving, 831-6015.

GIRL'S SCHWINN BIKE, \$60; boy's bike, \$30. Lyo, 299-6470.

'61 ALFA ROMEO SPYDER CLASSIC, completely rebuilt engine, new top, \$5500. Zownir, 256-3753.

'85 SOUTHWIND CLASS A MOTORHOME, 30', generator, 2 roof ACs, awning, extras, \$32,500. Ward, 884-9266.

WOMAN'S BICYCLE, Schwinn World Sport, 10-spd, touring handlebars, saddle, \$60. Owyong, 294-1884.

'82 PLYMOUTH RELIANT, 2-dr., manual, AC, cruise, \$2,200 OBO. Perea, 891-0018.

'86 FORD BRONCO II XLT, loaded, \$11,000 OBO. Bennett, 821-7415.

'71 MUSTANG, metallic red, V-8, AT, AC, PS, \$2000 OBO. Hilton, 898-6711.

10-SPD. BICYCLE, Raleigh Gran Sport, 23" frame, 26" wheels, rear carrier, mirror, spares, \$170 OBO. Shurtleff, 296-7870.

'75 VOLVO 244DL, light blue, 4-dr., AM/FM, AC, AT, new upholstery. Lujan, 836-3447.

WOMAN'S 10-SPD. BIKE, Murray, (Baja mountain-style), new, \$90. Andersen, 294-8624.

'83 TOYOTA TERCEL SR-5 SW, 4-WD, silver, stereo tape player. Douglas, 281-9843.

'77 LINCOLN MARK V CARTIER, 69K miles; '76 Peugeot 504, 56K miles. Montoya, 884-5174.

'85 PORSCHE 944, 11K miles, leather seats, Blaupunkt stereo, power sunroof, custom roof rack, best offer above \$15,500. Lagasse, 293-0385.

'72 FORD CONVERSION VAN, 3/4 ton, 80K miles, AC, AT, propane cook top, AC/DC refrigerator, \$1600. Kaye, 293-0499.

'73 EXECUTIVE CLASS A MOTORHOME, 26', Dodge 440, sleeps 7, self-contained, new brakes and tires, extras. Palmer, 292-6443.

'81 KAWASAKI KZ750E, 14K miles, 1/4 faring, tank bag, \$1000 OBO. Brusseau, 891-2841.

'78 ALPHA ROMEO SPYDER, convertible, red w/black interior, 20K miles, \$7500. Norwood, 292-0072 after 5.

'83 SEDAN DeVILLE, 56K miles, \$1600 below blue book, \$5400 OBO. Monty, 821-3758.

'85 HONDA ACCORD, 4-dr., AC, AM/FM tape, 5-spd., PS, PB, cruise, \$6200 OBO. Garcia, 293-3937.

'82 BUICK Le SABRE SW, 8-passenger, extras, 73K miles, \$3600. Bornhoff, 821-7182.

ALUMICRAFT CANOE, 17', \$295. Gregory, 344-1436.

'82 HONDA GOLDWING, \$10,000 invested, garaged and covered, \$3500 OBO. Gilbert, 898-2605.

'79 FORD THUNDERBIRD, loaded, new tires, brakes, shocks, mufflers, w/some transferrable warranties, \$1700 OBO. Hoselton, 294-6109.

FISH/SKI BOAT, open bow, new 140-hp I/O, alternate battery, travel cover, depth finder, troll brake, trailer, \$3950. Bland, 243-1003.

REAL ESTATE

2-BDR. TOWNHOME, 1 bath, 1060 sq. ft., FP, appliances, garage, landscaped, mountain views, near Tanoan, \$70,000. MacCosbe, 255-5084 or 293-3492.

TWO ACRES MOUNTAIN PROPERTY, 25 miles from Albuquerque, no utilities, \$150 month, plus equity, negotiable terms, solar exposure. Lynch, 292-8523.

3-BDR. HOUSE, 1-3/4 baths, double garage, pitched roof, FP, 10% 15-yr. FHA assumable, near Montgomery and Moon, \$87,500. Chiu, 294-4634.

3-BDR. TOWNHOUSE, Four Hills area, 1-3/4 baths, carpeting, ceramic tile entry, country kitchen, new stucco, landscaped, \$59,900. Burstein, 821-6688.

3-BDR. ALL-BRICK HOME, 2 baths, den w/beam ceiling, new carpeting, hardwood floors, fruit trees, garden, \$119,500. Anthes, 884-3644.

2-BDR. CONDOMINIUM, Hillcrest Park, den, assume 8% mortgage. Alpaugh, 884-3966.

2-BDR. TOWNHOUSE, 1 bath, skylights, FP, garage, solar, no association fee, 1072 sq. ft., assumable 9.5%, \$63,500. Williams, 265-7960.

4-BDR. HOME, 2 MBR suites, 3 baths, den, FP, 2750 sq. ft., plus 410 sq. ft. sun room, \$144,500. Caffey, 296-1942.

2-BDR. MOBILE HOME, '78 Bendex II, 2 baths, \$8,000 cash. Guffey, 828-2713 after 5.

ONE OR TWO ACRES, in Peralta subdivision, view of mountains, \$24,000/acre. Barnaby, 865-3733.

4-BDR. HOME, 2000 sq. ft., Tramway/Indian School area, Eldorado High, \$98,000. Sleaf, 281-4103.

3-BDR. HOME, Tramway/Indian School area, 1900 sq. ft., 1-3/4 baths, landscaped, flexible financing, July occupancy. Nimick, 296-0196.

2-BDR. MOBILE HOME, 65' x 14', all appliances, 2 storage sheds, patio and driveway covering, landscaped. McCall, 266-4483.

WANTED

TWO-DRAWER FILING CABINET, must be sturdy, prefer legal size. Underhill, 294-5774 after 5:30.

CROSS-COUNTRY SKI EQUIPMENT: man's boots, size 44; skis, 205-210; poles. Allan, 299-4163.

MUSICIANS, for Sandia brass ensemble: French horn, baritone, trombone; must sight-read at reasonable level. Guthrie, 299-7182.

RESPONSIBLE "BUDDY" SCUBA DIVER, to dive lakes. Meirans, 298-4738.

NORDICTRACK CROSS-COUNTRY SKI MACHINE. DiMarzio, 291-9225.

"LAND BEFORE TIME" hand-puppets from Pizza Hut, especially Cera. Smith, 243-5481.

HOUSE OR TOWNHOUSE TO RENT, w/garage and fenced yard, have dog and cat. Surma, 293-2420.

BOAT TRAILER, for 14' aluminum boat. Grasser, 292-3799 or 291-0947.

MOUNTAIN BIKE, 21" to 22", high-performance frame (E.G. Ritchey, Ibis), prefer Shimano components. Lagasse, 293-0385.

PERSONS FOR TRIP TO PERU, May 27-June 10 (Cuzco, Machu Picchu, Nazca Lines, Lake Titicaca, Lima, etc.). Schubeck, 821-3133.

MAINTENANCE MANUAL, for '69-'70 Ford Mustang. Smith, 823-5481.

Western Whoop-De-Do Tonight at the Club

IF YOUR BOOTS ARE MADE FOR DANCIN' — your cowboy boots, that is — tonight's your lucky night. Those good old Poor Boys from Isleta are strummin' the stomp music this evening from 8 p.m. to midnight. Beforehand, enjoy some very reasonable (\$5.95) chow — a BBQ combination plate (beef/chicken/ribs), accompanied by baked beans, a baked potato, corn bread, and a choice of dinner salad or cole slaw. Lots of cowpokes (and cowpokesses) always turn out for Western Night, so you'd best call in that reservation right away (265-6791).

APRIL'S ONE-AND-ONLY SUNDAY BRUNCH happens this weekend (April 9) from 10 a.m. to 1 p.m. Tantalizing taste-bud treats include baked ham, roast beef, mashed potatoes, corn on the cob, green chile stew, western omelets, French toast, and more. Top it off with dessert from the sundae bar (soft ice cream and a choice of three toppings). Cost is \$6.95/adults and \$3.50/children. And remember, the membership discount applies (up to \$2/family) on Sunday brunches and Friday-night dinners. Reservations requested.

WE HEARD IT THROUGH THE GRAPEVINE: Bingo nights this month are likely to produce some big-jackpot winners. Your chance to get in on

the action happens every Thursday night (April 13, 20, 27). Card sales start at 5:30 p.m., and you can kiss the kitchen chores goodbye; an inexpensive buffet (available from 5:30 on) takes care of the hunger pangs. Playtime starts at 6:45 with the early-bird game. Check out future prizes in the lobby display case.

SPEAKING OF PLAYTIME, the T-Bird card sharks are back at it next Thursday, April 13, starting at 10 a.m. There's nothing over-the-hill about *this* gang; they may be retired, but they surely aren't retiring! Come on out for all kinds of card games, free refreshments and door prizes, and sparkling repartee that's second to none.

DON'T WORRY, BE HAPPY: Here's a sure cure for your tax trauma and that soon-to-be-empty pocketbook. Chase away those 1040 blues at the Hobo Dance next Friday night (April 14). Start with the blue-plate special: beef stew and bread for just \$3.50 (a stand-out bargain, even if you have to ante up some tax money on April 17). Enjoy some rollicking entertainment from a song-and-dance group, the Carlow Performers, from 7:30 to 8 p.m. By that time, you've tossed away your troubles, and are ready to dance the night away to the mellow music of the

Roland DeRose Orchestra (8-11). P.S. If you're counting on a tax refund this year, forget the blue-plate special and go for the two-for-one dinner: your choice of T-bone steak or shrimp, \$18.95/two.

Take Note

The New Mexico Section of American Society of Mechanical Engineers and UNM's College of Engineering will present the 27th ASME Symposium, "Hazardous Waste — Impact Mitigation through Innovative Processing Technology," May 24-25 at UNM's Woodward Hall. Dick Lynch (6300) is symposium program chairman. Other Sandia participants include John Holmes, Craig Tyner, Jim Fish (all 6216), Don Schueler (6220), Dick Traeger (6250), Bill Luth (6230), and Sheridan Johnston (8364). Call 881-6800 for registration forms; deadline is May 15.

* * *

Tim Rumsey, UNM employee trainer and educator, will talk about "Hoopla — Injecting Fun and Humor Into Work" at the Professional Secretaries Week Seminar April 22 at the Holiday Inn Midtown. The seminar, sponsored by Professional Secretaries International, is from 9 a.m. to 3:45 p.m.; registration is \$60 (\$25 for full-time students and retirees) and includes lunch. Call Barbara Saya (6512) on 4-1469 for information.

Easier Than Ever to Use

Design Centers Offer Quick Access To Engineering Information

Handbooks and manuals, and government standards, Theories and methods, techniques and procedures, Complete catalogs of commercial suppliers . . .

Parts information and test systems data, Standards and specs — military and federal, Reports on mathematics and parts and components. . .

While these things may not equal the appeal of the "warm woolen mittens" and "whiskers on kittens" touted in Rogers and Hammerstein's *Sound of Music* (the rhythm's a bit off too), they are a few of the "favorite" things kept on file by Sandia's two Design Information Centers.

The Centers were established almost 20 years ago to provide up-to-the-minute data on products and suppliers, materials, processes, and components so that Sandia's engineers, designers, and drafters wouldn't have to waste time searching out this kind of information.

"The Design Information Centers feature easy access and quick results," says Jerry Hastings (2833), who heads the Center in Bldg. 892, Rm. 118. "We have two-way indexing — by supplier and by product. It takes only a few minutes to locate, for example, the design specifications for a particular commercial part.

"If we don't have the information you need, we'll find out where it is and direct you to it. Our primary goal is to help our customers make the best — most efficient — use of their time."

In either of the Centers — Joan Keith (2833) heads the one in Bldg. 836, Rm. 214 — Sandians have immediate access to more than 25,000 supplier catalogs, military and federal standards and specifications — and more.

"The Centers are set up to be do-it-yourself operations," says Joan. "An average of 450 people use them every month. Our new reader-printers are a snap to use after only a few minutes of instruction. But we're here to help — if you have a problem finding the information you need, we can usually help you find it right away."

Strategically located to serve all Sandians, the Bldgs. 836 and 892 Design Information Centers maintain duplicate files.

Another service of the 836 Center is GIDEP,

the Government-Industry Data Exchange Program. Pat DeTevis (2833) coordinates its extensive files of engineering data, test data on products, materials and processes, and metrology data. He maintains four different GIDEP files and channels Sandia contributions into the national efforts of 1,000 participating agencies.

"Sandia has been one of the top 20 data submitters for the past two years," Pat says. "By pooling and coordinating efforts, GIDEP saves government and industry significant time and money."

GIDEP files are not available in the Bldg. 892 Center. ●DR

Sandia Colloquium

Richard Muller, director of the University of California Berkeley's Integrated Sensor Center, will talk about "Micromechanics" at the Technology Transfer Center (Bldg. 825) April 14, 9 a.m. Call host Gary Ferguson (2530) on 4-7144 for information.

The next meeting of the New Mexico Network for Women in Science and Engineering is April 19 at 6 p.m. at the home of member Jeanne Vreeke. The evening includes dinner (\$6) and a program about computer viruses presented by Dave Bailey (LANL computer-security consultant). Meetings are open to nonmembers. Call Donese Mayfield (9224) on 4-8811 or Beth Sellers (DOE) on 6-2102 for information.

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Johnson Space Center Assistant Director Joseph Loftus will talk about "The US Space Program: Status and Future Prognosis" at a dinner meeting of the Rio Grande Chapter of the American Society for the Advancement of Material and Process Engineering April 12 (7 p.m. dinner, 8 p.m. program) at the Los Alamos Inn, Kiva Peace Pipe Rm. Cost is \$12. For information and reservations (deadline April 10), call Joel Katz on 1-665-1424.



SANDIA'S TWO DESIGN INFORMATION CENTERS are strategically located to serve all Sandians. Both are managed by Engineering Procedures, Specifications, and Support Div. 2833. This one in Bldg. 892, Rm. 118, is overseen by Jerry Hastings (left); Joan Keith oversees the one in Bldg. 836, Rm. 214. Pat DeTevis (seated) coordinates the Government Industry Data Exchange Program, a service of the Bldg. 836 Center.