

# Output: Electricity



A DECK of four solar cells (left), for direct conversion of solar energy to electricity, is mounted upon a thermal collector pipe which converts solar energy to heat. Right, samples of thin films which may supersede silicon as the working material of solar cells. Don Schueler (5113) heads the Photovoltaic Working Group.

If all the sun's energy falling on three square meters (about 30 square feet) could be converted to electricity, a day's sunlight would produce the daily electrical needs for the average home (15-20 KWH). Direct conversion of sunlight to electricity by photovoltaic cells is possible now. Making the conversion economically competitive is the next step.

The Sandia photovoltaic (light-to-voltage) energy conversion program was initiated last summer by George Samara (5130). The program focuses on solving some of the pressing technical and economic problems associated with photovoltaic conversion and emphasizes the feasibility and economic tradeoffs of integrating this conversion scheme into the total energy economy. "Although many other laboratories are currently investigating photovoltaic devices," says George, "we at Sandia possess some unique in-house capabilities and broad expertise directly applicable to all aspects of photovoltaic conversion. This should allow us to make significant contributions in this area."

A newly formed Photovoltaic Working Group, headed by Don Schueler (5113), is exploring several possibilities of photovoltaic energy conversion. The part time efforts of Jim Borders (5111), Will Smith (5113), Ed Burgess and Bob Nasby (5155), Jerry Fossum and Victor Wells (2113), Ray Berg (5834) and Gail Barton (4736) are involved.

"What we're aiming to do," says Don, "is to apply solar cells to terrestrial use to reduce the consumption of fossil fuels. After all, solar energy is pollution-free and virtually undepletable."

Arrays of silicon solar cells have been used routinely to supply electrical power for spacecraft on the Skylab and Apollo missions. In space it's a question of lightest weight and highest possible reliability — the success of the missions and the lives of the astronauts depend on the solar power supply. Cost is a secondary consideration.

Back on earth, costs become paramount. If electricity from the sun is to become economically attractive, the conversion process must at least approach the costs associated with converting fossil fuels (coal, oil, and natural gas) to electrical power.

The heart of a photovoltaic energy conversion system is the solar cell. The ones used in the space program are small (2 cm by 2 cm) single crystal silicon wafers. Each cell has two layers; one with a deficiency of electrons (positive) and one with an excess of electrons (negative). The resulting electrical imbalance at the interface between the layers (called a P-N junction) creates a "built-in" electrical field in the cell. When light rays from the sun strike the cell, the sun's energy (which is absorbed in discrete amounts called photons) dislodges electrons from the atoms which make up the crystal. These "free" electrons then move under the influence of the electric field to produce a current across the P-N junction. By affixing leads to each layer, the current in the cell can be drawn off to produce electrical power in an external load.

In a sense, the energy in the sun's ray is imparted to electrons in the solar cell. These "excited" electrons then carry the energy in the form of electrical power to do useful work. Present day silicon solar cells are able

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## LAB NEWS

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APRIL 26, 1974

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA



SENATOR PETE DOMENICI strides with President Sparks toward the Labs auditorium where he delivered an address to employees. The Senator's talk was followed by a discussion period with Sandians.

### Take Stock in America

Chairman for this year's Savings Bond drive is Luke Heilman, director of Org. 9500. He will be assisted by these representatives from each vice presidency: Howard Viney, 1000; Ted Church, 2000; Ted Sherwin, 3000; Jack Wiesen, 4000; Mark Davis, 5000; Bob Tockey, 8000; and Joe Stiegler, 9000.

The Bond drive is scheduled to run from May 13 through May 24. Each employee will be contacted in an effort to raise the present level of participation from 83% to 90%.

Announcing the drive, Mr. Heilman noted that the interest rate on Bonds has increased. Series E Bonds now on sale return 6 percent interest, compounded semiannually, when held to maturity of five years. They earn 4½ percent the first year; thereafter, interest will increase on a graduated scale, raising the yield to 6 percent from issue date to maturity.

After maturity, Bonds continue to gain interest at 6% per annum, compounded semiannually.



# Credit Union Reporter

By Earl Simonson (4122)  
President



Good News for Credit Union Members:

The Board has raised the limits for savings, effective immediately. The limit for regular members has been increased from \$6000 to \$10,000 and the limit for custodial accounts has been increased from \$2500 to \$3500.

In addition, the Board approved a new "add-on" loan policy. Starting June 1, it will be possible for a member to establish a loan limit in advance, borrow as much as he needs at any time he chooses. This may be done by phone, and the check will be mailed to his work organization, home or bank. Interest rates will remain the same, and almost any collateral, including signature, will be accepted. Complete details will be mailed to members shortly.

## AVS Symposium To Be Held In Santa Fe Next Week

The 10th Annual Symposium of the New Mexico Chapter of the American Vacuum Society will be held April 30-May 2 at the Hilton Inn in Santa Fe. A three-day comprehensive course on basic vacuum technology will again be offered, and, for the first time, advanced courses in specialized areas of vacuum science will also be offered. The symposium and all courses are conducted concurrently.

This year the advanced study is in surface science technology and three one-day courses are scheduled: "Surface Analysis by Electron and X-Ray Activation Methods," by Jack Houston (5114) and Paul Holloway (5825); "Surface Analysis by Mass Spectrometric Techniques," by John Panitz (5114); and "Sputter Deposition and Ion Plating Technology," by Don Mattox (5834). Warren Taylor (9531) is handling registration for all courses.

The symposium program includes a number of Sandians who will present papers in all areas of vacuum science and technology. Symposium chairman is Walt Ellis of LASL.

The Credit Union will add about 2500 sq. ft. of new floor space to the building, and construction should be complete next December. Much of the new space will be used for safe deposit boxes, including larger sizes than now available. If you wish to rent a new box, add your name to the list now.

Your Credit Union is considered a leader among credit unions. We get this word from several sources. Federal Credit Union Auditors consider our supervisory committee and audit staff as the best in this district. Their procedures are commended to other credit unions as models.

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Our credit union staff has been assisting the Bell Telephone and KAFB credit unions with their conversion to an on-line computer system.

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The Board recently declared a first quarter dividend at the annual percentage rate of six percent. This rate has been paid continuously since 1970.

## Don Longcope Earns PhD



On Jan. 10, Don Longcope (1541) was awarded a PhD in aeronautics and astronautics from Stanford University. He attended Stanford under Sandia's Doctoral Study Program. His dissertation was entitled

"Pulse Propagation in an Inhomogeneous Medium." His dissertation advisor was Prof. C.R. Steele.

Don earned a BA in 1964 and a BS in ME in 1965 from Rice University. In April 1967, following his graduation from Stanford with an MS in mechanical engineering design, he joined the Labs as a staff member in the advanced systems development organization. Don remained with this group, working primarily in the area of reentry vehicle structural mechanics, until September 1970 when he was selected for DSP.

Since returning to Sandia, Don has been assigned to Applied Mechanics Division 1541 and currently is working on wave propagation problems in solid mechanics.



QUIN SAN HAMEL joined Sandia's 6000 organization last week as an attorney. He is on leave of absence from Teletype Corporation in Skokie, Ill. Quin's home is in Chicago, and until this assignment he had never visited Albuquerque. His interests include sailing, skiing, and playing tennis. "People keep apologizing for the recent windy weather," Quin says, "—please don't — I think it's beautiful!"

## Sandia Colloquia

- |          |  |
|----------|--|
| April 29 | <b>Materials Science Seminar.</b> Dr. Dieter Gruen, Argonne National Laboratory, Subject: "Chemical Effects of Thermonuclear Plasma Interactions with Solids", Bldg. 806, Rm. 201, 8:30 a.m. (inside). |
| May 2    | <b>Sandia Research Colloquium.</b> Professor Mischa Schwartz, Columbia University, Subject: "Computer Communications Networks," Bldg. 815, 10:15 a.m. (outside area).                                  |
| May 6    | <b>Sandia Research Colloquium.</b> Dr. Donald D. Clayton, Rice University, Subject: "The Astronomy of Radioactivity," Bldg. 815, 10:15 a.m. (outside area).  |
| May 8    | <b>Technology Colloquium.</b> Ken Cole: "Rain Erosion," Bldg. 815, 10:15 a.m. (inside).  |

## LAB NEWS

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### SANDIA LABORATORIES

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as does norma taylor while  
bill laskar takes/makes pictures  
&

in livermore lorena schneider does all

## Events Calendar

- April 26** — Rodey Theater, UNM, "Zapatera" — through May 4, 8:15 p.m., 247-4402.
- April 26** — Albuquerque Little Theater, "Best of Friends" with June Lockhart, through May 2, 242-4750.
- April 26-28** — Antique Show, Convention Center.
- April 26-27** — Charity Bazaar, Winrock Shopping Center.
- April 27** — Moving Pictures, Ltd., "The White Sheik," 10 a.m. & 12 noon, Guild Theater.
- April 27-28** — NM Mt. Club, How To Hike, Backpack & Car Camp, exhibits, demonstrations, Tijeras Ranger Station on South 10/14, both days.

- April 28** — Annual Track & Field Meet, PAL, Wilson Stadium, 9 a.m.
- May 1** — UNM Jazz Band, 8:15 p.m., Keller Hall, UNM.
- May 1** — Green Corn Dance — Annual Fiesta, San Felipe Pueblo.
- May 2-4** — Classics Theatre Company's, "A Man for All Seasons," 8:15 p.m., May 5 matinee 2:15 p.m., Popejoy Hall.
- May 3-5** — NM Quarter Horse Show, Horse Arena, State Fairgrounds.
- May 4-5** — Cactus Club Flower Show, Flower Bldg., State Fairgrounds.
- May 5** — Carson & Barnes Circus (Kiwanis), 2 and 4:30 p.m., Rio Ranchos.
- May 8-11** — Sanado Art Show, Winrock Shopping Center.



# EAST AVENUE SCHOOL



## Career Day



SANDIANS joined with people from 65 other organizations to make Career Day at Livermore's East Avenue School a tremendous success. Shirley Carson (8442), upper right, discussed the job of keypunch operator, while Norm Wagner, left, and Hal Short, lower right (both 8442) explained what a computer programmer does. The Labs provided the keypunch machine and remote computer terminal for demonstration purposes.

## Take Note

John Daniel (8265) has been awarded a bachelor of fine arts degree in graphic arts from the California College of Arts and Crafts in Oakland. His course work was completed under Sandia's Educational Aids Program over a five-year-period. John joined Sandia/Livermore in June 1958 after receiving his AA degree in civil engineering from Stockton College. He has since worked in the Technical Art Section, first as a staff assistant and, since 1969, as a staff associate.

\* \* \* \*

Six Sandia teams — two women's and four men's — competed at Granada Bowl in Livermore recently as part of the third annual Mail-O-Graphic Bowling Tournament sponsored by the National Industrial Recreational Association. Coordinators for the event were Paul Dominguez (8161) and Mary O'Shea (8266). National winners will be announced and trophies presented on May 20.

### Sympathy

To Don Gregson (8150) on the death of his mother in Des Moines, Iowa, April 3.

To Dick Ballard (8212) on the death of his father in Selma, Ala., April 7.

To Frank Maestas (8433) on the death of his mother in Livermore, April 8.

To Jim Swisher (8313) on the death of his father-in-law in Warren, Ohio, recently.

To Hank Lucas (8252) on the death of his father-in-law in Chicago, April 1.

To Cliff Potthoff (8155) on the death of his father in Burke, S.D., March 31.

# LIVERMORE NEWS

VOL. 26, NO. 9

LIVERMORE LABORATORIES

APRIL 26, 1974

### Authors

Jack Dini, Rudy Johnson and John Helms (all 8312), "Nickel-Plated Uranium: Bond Strength," *PLATING*, Jan. 1974.

Taz Bramlette (8111) and R.R. Smith and N.J. Sliski (Wright-Patterson AFB), "Fin-Induced Laminar Interactions of Sharp and Spherically Blunted Cones," *JOURNAL OF SPACECRAFT AND ROCKETS*, Nov. 1973.

Al Jones (8114) and Joe Grant (8040), "Generation and Properties of Banded Viscous Damping Matrices," *COMPUTERS AND STRUCTURES*, Vol. 3, pp. 1037-1051, Nov. 1973.

Hugh Coleman and Clark Lemmon (both 8111), "Turbulent Interference Heating on Several Small Fin Configurations," *JOURNAL OF SPACECRAFT AND ROCKETS*, Dec. 1973.

Jack Dini and Rudy Johnson (both 8312), "Joining by Electroplating," *PROGRESS IN MODERN TECHNOLOGIES*, Feb. 1974.

Ron Wishart (8252), "Pressure Gages — How Safe Are They?" *DESIGN NEWS*, Feb. 18, 1974.

Jack Wilson (8413), "Metric System — Regaining a Positive Balance of Trade," *PACIFIC BUSINESS*, Jan./Feb., 1974.

### Congratulations

Mr. and Mrs. Steve Guthrie (8334), a daughter, Heather Katherine, Feb. 28.

Mr. and Mrs. Al Reichmuth (8434), a son, Neil Louis, March 20.

Mr. and Mrs. Dick Houser (8412), a son, James Alexander, April 14.

### Speakers

Bob Schmieder (8342), "Atomic Spectroscopy Using the Electron Ring Accelerator," invited presentation to the Physics Department, University of California at Berkeley, Feb. 13.

George Perkins (8213), "Budgeting: Key to Planning and Control," Freshman Introduction to Business Class, Livermore High School, March 14.

### Retiring



Marie Brenton (8433)





INSTRUMENTATION PACKAGE for the balloon flight May 15 is readied in Bldg. 892 High Bay area. Here, project leader Al Watts (1255), and BTL engineer Gardner Burkhardt work on the 5000-lb. payload.

## Stratosphere Balloon Launch Set for May 15

A seven million cu. ft. balloon carrying a 5000 lb. payload of scientific instruments will lift off from Holloman AFB before dawn on May 15. Part of Sandia's continuing environmental research program, the event will be the third in a series of balloon-borne experiments to make simultaneous and comprehensive measurements of the upper atmosphere.

Twenty instruments in the gondola of the balloon will measure the composition, chemistry and dynamics of the atmosphere at altitudes from 15 to 30 kilometers. Planned total flight time is 30 hours. The instruments will gather data continuously during sunrise and sunset, periodically between these times.

Frank Hudson (1722), scientific coordinator, reports that this experiment will be one of the most comprehensive efforts yet made to analyze the stratosphere. Sandia pioneered this type of study with balloon flights in September 1972 and October 1973. Seven other agencies, including Bell Telephone Laboratories and the Atmospheric Sciences Laboratory, WSMR, will have experiments and instruments on board. Sandia is providing direction of the project, command systems, power supplies, telemetry and two scientific experiments.

The balloon is expected to remain within 200 miles of Holloman. If winds cause the balloon to drift out of range of the telemetry, a specially instrumented C-54 will take off from Holloman and follow the balloon. The ground station instrumentation, telemetry receivers and command transmitters will be on board the aircraft.

Instruments and Sensors Division 1255 under Keith Smith is responsible for the operation. Al Watts is project engineer. Bob Woods is responsible for the transport studies, Ralph Schellenbaum for ultra violet experiments.

### Deaths

Orville Furrow of Plant Modification division 7513 died April 5 after a brief illness. He was 38.

He had worked at the Labs since August 1966.

Survivors include his widow, two daughters and a son.



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Paul Taylor of Stockpile Systems Test Laboratory/Amarillo died suddenly April 10. He was 51.

He had worked at Sandia since March 1946.

Survivors include his widow, two sons and a daughter.



**Continued from Page One**

## Output: Electricity

to convert from 10 to 15 percent of the incident solar energy into electrical power.

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The photovoltaic research program at Sandia includes three major projects. The one most likely to have immediate payoff is labeled Photovoltaic-Solar Thermal Integration. This project complements the current Solar Community program by offering a direct method to go from solar to electrical energy, as well as allowing a single residence, not necessarily a community of homes, to use the sun as its primary energy source. As visualized, by Don and Fred Vook (5110), the solar collectors would include silicon solar cells so they produce not only thermal (heat) energy but electrical energy as well. The thermal energy would serve to heat and cool the residence; the direct current (DC) electrical energy would be converted to alternating current (AC) to supply electrical needs or be stored in batteries for use when the sun isn't shining.

The electrical and thermal conversion would work well together — the solar cells need only the visible and ultraviolet portions of the sun's spectrum so the thermal collectors could absorb and use the rest of the solar energy that would otherwise damage the cells by overheating. Such protection is especially necessary if a focused tracking collector is used. Used in such a system, the solar cells could receive a concentration of sunlight 15 to 30 times the unfocused level, thus making each cell many times more productive and therefore more cost effective.

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The second photovoltaic research project concentrates on the potential advantage of cadmium sulfide (CdS) copper sulfide (Cu<sub>2</sub>S) thin film solar cells. These cells, which are

also being investigated by other laboratories, can be fabricated much more cheaply than can the silicon cells used in the space program, but currently they are less efficient, less consistent (in terms of power output), and shorter-lived when exposed to a normal environment.

"We have the in-house expertise to make improvements in all of these problem areas," says Will Smith (5113). "Our initial effort will concentrate on the properties of copper sulfide which is a very complex compound with seven known chemical forms ranging from CuS to Cu<sub>2</sub>S. The latter form is the best one for photovoltaic devices, but it is not a very stable compound. In this research program we will have to involve people with diverse backgrounds. We hope to make cadmium sulfide-copper sulfide solar cells with better reliability and durability, keep their costs low, and develop methods for making large area cells."

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The major reason that present day silicon cells are expensive is that each is made from a single crystal cut and polished to size. The third project, polycrystalline silicon film cells, will explore means of making thin film silicon cells which may achieve performance levels approaching those of single crystal cells without the associated costs. One method of forming the polycrystalline films is by chemical vapor deposition which also makes possible cells which cover a larger area. •bh







## Bldg. 802 Exhibit Work of Dave Tafoya

Current exhibit of large color photographs on display in the foyer of Bldg. 802 is the recent leisure-time work of Dave Tafoya of Still Photographic Services Section 3148-2.

The exhibit includes a wide range of subjects, from closeups of cactus blooms to monumental scenes of the New Mexico landscape. Also included are many recreational pictures of children fishing and families picnicking.

Dave has worked at Sandia almost 26 years, 20 of them as a technical photographer. He enjoys a change of pace during weekends in his photography of scenes of his native state.

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## Vista New Mexico

# Why Do Some New Mexicans Celebrate the Fifth of May?

It's not a misplaced Fourth of July celebration — rather it commemorates the May 5, 1862 battle at Puebla, Mexico, between crack French troops and outnumbered Mexican soldiers.

Unlike the Alamo, where the smaller force finally fell, Cinco de Mayo (Fifth of May) celebrates the victory (albeit temporary) of the underdog Mexicans.

Seen in historical perspective, the French had no business in Mexico in the first place. But Napoleon III saw the unrest in Mexico as

a good opportunity to make Franco-American a household word. He wanted to reestablish France's hold on the New World — after all, France had lost all of Canada and most of the US, and it didn't seem proper for France not to have something going in North America.

It was as good a time as any to invade Mexico. In fact, the religious hierarchy and the wealthy landowners cheered the French as liberators when they landed at Vera Cruz in the spring of 1862. For recently elected President Benito Juárez had angered both of these formidable enemies by, among other things, confiscating their huge estates and divvying them up among the peasants. Had Juárez majored in "Being Folk-Hero" he couldn't have done better: from humble beginnings (he was a full blooded Zapotec Indian) to election to Mexico's highest office; incorruptible, compassionate, and yet forceful. And a thorough believer in democracy — his constitution of 1857 is the basis for the current constitution.

It wasn't just any old French troops that were sent to Vera Cruz to oust Juárez. These were Zouaves — the élite of a proud military arm.

Juárez's troops fled to the inland city of Puebla and made a stand. Their weapons outmoded, their numbers insufficient, the Mexicans fought with fury.

The fierce battle, which lasted all day, was particularly sanguinary. But somehow the Mexicans won — even the leaders, General Zaragoza and General Díaz, weren't quite sure how, but won they had — Zouaves don't retreat, leaving a thousand dead, when they are victorious. Puebla's church bells rang out in victory — and the church bells throughout old Mexico and New have pealed every Cinco de Mayo since.

P.S. Unfortunately the war didn't end in 1862. One year later Napoleon III sent 30,000 troops to regain lost French honor. They did. The tragic reign of Archduke Maximilian and his wife Carlota followed. Too bad — they were a couple of nice kids who couldn't have known that Napoleon was using them in his attempt to become a great emperor like his Uncle Bonaparte. •bh



A TRANSFORMER is that small black box you attach to the tracks of your Lionel train set. But places like Sandia have many uses for them and Ralph Dalby of the Labs Transformer Shop (3612) shows the extremes. Coiled around the box-like frame is 7200 feet of wire; as a transformer, it is planned for use with an underground communications system. Transformer shown in inset is small enough to fit in penpoint opening, contains 200 turns of .001" wire within 1-1/2 millimetre diameter; it will probe noise spectrum in a ferromagnetic fluid.



## Recreation Notes

**Sandia Bicycle Ass'n.** — SBA'ers Tom Mayer (1247), Gordon Pike (5155), John Shunny (3162) and Don Bliss (7633) took part in the annual Century run last Sunday, 100 miles, not so much a race as an endurance contest. Finishing times ranged from 6 to 8 hours. Don's performance is remarkable — he's "in the 60's neighborhood."

Guards report a number of cyclists running stop signs within the Tech Area. This really isn't too bright — someone may get hurt and the presence of bikes within the Tech Area would certainly be re-examined in the event of an accident.

Your support is needed for bikeways when the subject is discussed at a May 2nd meeting of the Environmental Planning Commission at 7 p.m. in the City Commission Room of City Hall. The EPC will vote on a resolution to adopt the proposals set forth in the Bikeway Advisory Committee's report, to create a permanent Bike Advisory Committee, and to establish the task forces necessary to carry out the report recommendations. Help cycling and help yourself — attend this important meeting. Gordon Pike (ext. 9168) has more information on the subject.

Remember the "all speed drive" we mentioned here a few issues back? Quite a few SBA'ers asked for the literature and one,



SRA'er PETE RICHARDS (5132) shows Boston Marathon form. Pete finished the 26-miler 338th in field greater than 1700.

# FUN & GAMES

Clyde Babcock in Tech Art, bought the forty or so dollar device. Clyde's reaction: put it back on the drawing board. For the brief period that it worked, it worked fine; but flimsy construction soon halted operation. Clyde sent the mechanism back.

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**Sandia Runners Ass'n.** — The Road Runners invite Sandia Runners to take part in their events. These are generally a series of low-pressure runs of all types, for men, women and children, over distances from 100 yards to 5 miles. The runs are held Tuesday evenings. On April 30 the group meets at Highland High School at 6:15, and on May 7 they meet at Rio Grande Park near Kit Carson Ave., 3 blocks west of the pool. Novice runs are planned at both meets.

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**SGA Spring Classic** — Winning team members of the Point Bar Tournament are: A Flight — Dick Blose (5832), Ken Wischman (5813), Tom Covert (5165) and Bill Saric (5643) with a point total of 116. Vic Sirwinski (9526) and Ralph Campbell (3148) tied for low net honors.

B Flight winners scored 121 points; team members are: Leo White (2331), John Ford (2336), Joe Gaynor (1522) and John Von Dreele (1522). Leo White also won the low net award.

For more information on SGA contact Tom Philbin (9614).

## Labs Man In Boston Marathon

Frank Shorter, the Olympic marathon winner, talks of long distance running as being "a sensual experience." Erich Segal, author of *Love Story* and a pretty fair marathoner himself, dwells on the pain and mental suffering of the activity. And the loneliness of the long distance runner is proverbial.

But Pete Richards, a Labs physicist (5132), was in the midst of the 26-mile Boston Marathon last week and felt like shouting from sheer exhilaration. He explains: "Look at me — 39 years old, never ran in competition until two years ago, considered myself a physical wreck ten years ago, and there I was running the best race of my life, feeling great, and doing a damn respectable job in the most prestigious marathon of them all!"

Pete's run was respectable indeed. In the field of 1700, he finished 338th with a time of 2:50:27, averaging 6 1/2 minutes per mile. He had never run farther than three miles a scant two years ago, making his performance all the more noteworthy.

The interaction with the crowd lining the entire 26 mile route spurs the runner on, Pete found. Traditionally solitary and alone with his thoughts, the Boston Marathoner finds himself awash in cheering humanity. The adrenalin flows, euphoria mounts, you run faster than you thought you possibly could and, well, you feel like shouting for joy. Pete reports he probably got more crowd action than most with his Albuquerque T-shirt.

As it turns out, Pete never did shout. In a 26-miler you practice economy, and shouting, after all, does take a certain effort. • js

**On To Spain** — A flyer from the U of A announces what appears to be a good deal for an eight day trip to Spain. Running from July 16 to 24, the tour aims at the Costa Del Sol-Andalucian region and is conducted by Professor Paul Carpenter, an authority on this region. The \$399 tariff includes round trip fare from Albuquerque, hotel-on-the-beach accommodations, two meals per day, transfers, and tips. Tax and something called a fuel surcharge is extra. Call Warren Lee at the U of A on 243-9461, ext. 261, if you're interested.

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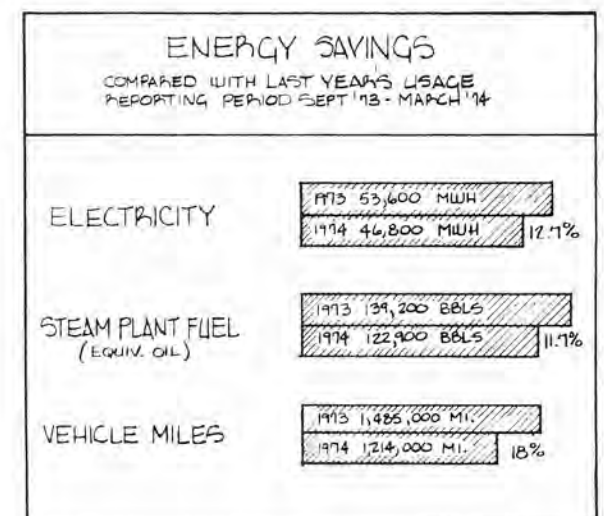
**Coronado Ski Club** — Dates are set for eight ski trips during the '74-'75 ski season. Announcing these dates in April may strike you as a bit premature, but it is necessary to reserve now to get lodging at minimal prices. Contact the trip chairmen for more info on the trips and deposits. Sign up now; trips are full by summertime.

Trip	Dates	Chairman
Wolf Creek	Dec. 7, 8	Ed Harley
Telluride	Late Dec.	Jim Caruthers
Snowmass	Jan. 4-10	Dave McVey
USSA Ski Week	Jan. 4-12	Don Schroeder
Vail & Copper Mtn.	Jan. 25-29	Carl Peterson
Steamboat	Feb. 8-12	Walt Westman
Crested Butte	Feb. 15-17	Bob Butler
Alta, Snowbird	Mar. 8-12	Walt Westman

Purgatory: Suggest some uncrowded weekend to Don Schroeder.



**Salt some away.**  
Buy U.S. Savings Bonds



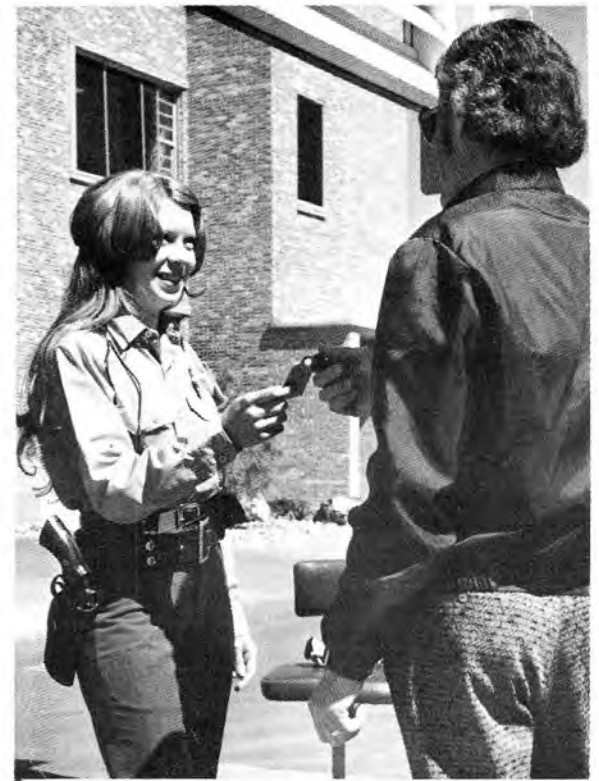
## Ximenes to Speak

Chicanos Unidos have scheduled a meeting Thursday, May 9, at 8:00 p.m. at Public Service Company's hospitality room, 414 Silver S.W. Purpose of the meeting is election of officers. Featured speaker is Vincente Ximenes, former chairman of the President's Cabinet Committee on Mexican-American Affairs.





FAY TAMASHIRO really did shoot the target she's pointing at.



LORI SYVERSON checks a badge.

JO PATTON on the microphone.

## The Uniform Never Looked Better

By the time this appears, many Sandians will have noted that we now have female security inspectors. Four of them on a full-time basis and two more on the substitute force (who are called in to cover for full-timers on vacation or sick).

The new inspectors have completed the customary training curriculum, qualified with the .38 revolver on the range and, after some swing shift on-the-job training, will be assigned the graveyard (11 p.m. to 7 a.m.) shift. These photos show them during training.

AIMING the .38 is Beverly Clayton. She's backed up by Linda Edgar. Both are being trained as security inspectors.





# feed back

To get a response to your comments and questions about Sandia Labs, complete a Feedback form (available near bulletin boards) and return it to the Feedback administrator. The substance of questions and responses of wide interest is published in LAB NEWS.

*Q. I would like to see the Air Force make helmets mandatory for bicyclists on Base, just as they did for motorcyclists before the state helmet law came into effect. Does the Air Force plan any such action?*

A. Your question regarding helmets for bicyclists on Base was discussed with a military representative. You are correct that the military did require a helmet for motorcyclists prior to any State of New Mexico law. However, an opinion was expressed that this requirement would not have withstood a court challenge, of which there was none. The current Air Force policy in matters of traffic control and safety is to abide by and conform to the laws of the host state. In consonance with New Mexico law, Kirtland has, by regulation, promulgated a similar requirement on-Base.

New Mexico does not have any statute requiring bicyclists to wear helmets. Therefore, Kirtland has no plans for such a mandatory regulation. However, an Air Force Ad Hoc Bicycle Safety Committee of the Base First-Team Airman's Advisory Council is looking into the possibility of having the wearing of a helmet made optional for military personnel. One hold-up on doing even this is that current Air Force dress codes do not permit other than regulation headgear being worn, with the exception of that for motorcyclists.

Another reason the Air Force has turned down suggestions to make this optional is that "Their accident statistics do not show any injuries or accidents attributable to a rider's loss of hat." The Air Force representative said, "The Committee is still looking into accident statistics with an eye toward asking the Air Force to reconsider."

To encourage Sandia bicyclists to use helmets, an article in the *Lab News* of 11/16/73 described a helmet tested by Gordon Pike, 5155, who concluded that "The helmet offered as good protection as can reasonably be attained." The Air Force Committee is considering this helmet for use if approvals can be obtained for its use with the Air Force uniform.

—L.J. Heilman - 9500

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*Q. We've been in our present location for about four months. In that time we have answered hundreds of phone calls for the Division that was here before us. Couldn't the resulting loss of productive time and a major source of daily irritation be avoided by updating our phone books more frequently? If our experience is typical, we are wasting a lot of time to save a little paper.*

A. In order to avoid the very problems which you cite, it is our policy that, when circumstances permit, the telephone numbers belonging to an organization are normally transferred to the new location when the organization is physically relocated. For a variety of reasons, this is not always possible and in those cases we must rely on supervision to initiate the action necessary to make the telephone number changes known to interested parties.

The Sandia Laboratories Directory is

composed of two sections — the Personnel Section and the Organizational Section. The Organizational Section is compiled from updated listings furnished by the organizations and is only as accurate as the information provided. Organizational change pages are issued as often as deemed necessary. Supervisors may request a change whenever there is adequate justification. The condition you cite, the relocation of a division with attendant phone changes, certainly would qualify as adequate.

The information for the Personnel Section is obtained from the official Personnel File which is kept current by secretaries submitting to Personnel Records Division 4256 all employee location data changes on Form SF 4010-EH (2-71).

Whereas all the changes within an organization can normally be taken care of by the publication of a single sheet in the Organizational Section, the same changes reflected in the Personnel Section could run to many sheets. Because of this cost factor, we are issuing this section in toto at least twice a year and whenever a major reorganization takes place.

—K.A. Smith - 3100

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*Q. A comment: Seems to me the Labs should reconsider how government vehicles should be used in the Tech Area — they should be used to move heavy equipment and not bodies. Legs are good transportation. People should learn how to use them again.*

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*Q. (from SLL) What are the possibilities of a supplement to our present Equitable Health Care Plan to relieve the long term hospitalization and associated expenses?*

A. In recognition of the need to increase the maximum benefit level of the Equitable Health Care Plan, effective Jan. 1, 1974, the present \$20,000 was increased to \$40,000. In addition, the annual reinstatement provision was increased from \$1000 to \$2000.

Sandia's intention has been to make alternate health plans available through Kaiser (with or without the Supplement) for our Livermore employees, and either of two prepaid health plans for Albuquerque employees. This provides our employees the opportunity to select that form of health plan coverage which best meets individual needs. Considering total plan costs and coverage we feel that the present plans are in reasonable balance and do not anticipate any additional changes.

—D.S. Tarbox - formerly 4200

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*Q. Will there be any protection from inclement weather provided for passengers of special buses (such as the hutments on Main St.)?*

A. No hutments are planned because most of the Area I bus stops already have some protection from bad weather. Passengers waiting at Gate I should use the overhang in front of Bldg. 803 or the hallway

of Bldg. 802. Those waiting at the Cafeteria are welcome to use the entire building. Gate 6 and 10, admittedly, have no protection, but those waiting there (or at any other board point) are encouraged to walk to the Cafeteria during bad weather.

—K.A. Smith - 3100

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*Q. Has Sandia considered the possibility of granting full pay (instead of differential) to employees on voluntary military annual leave? Elimination of the draft has made a strong Reserve force even more essential; full pay for annual military leave would provide an additional incentive for employees to continue their Reserve and National Guard participation.*

A. Your Feedback question was one of many which suggested consideration of a possible change for differential pay to full pay for National Guardsmen and Reservists during summer training, and this answer is being given to all these inquiries. We invite you to share this answer with your fellow employees who have similar concerns.

The initial and continuing purpose of granting differential pay to National Guardsmen and Reservists for summer training has been to assure that these individuals will suffer no loss in total pay during their periods of training duty. Over the years, this has been and is still considered to be better than average recognition by business and industry of the need to support and encourage members of the Reserve Components serving in the defense of our country. This is borne out in a survey conducted by the Bureau of National Affairs of the members of its Personnel Policies Forum. For summer training duty, just over half of the companies surveyed compensate employees for leave taken to attend summer sessions. Of the companies following this practice, close to one in eight apply it to salaried employees only. Among the companies that compensate employees for this duty, most (64%) pay the difference between the employee's normal pay and his base service pay. Others (26%) pay the difference between normal pay and service pay plus allowances. Only a handful of companies (6%) award full pay for the period of absence without deduction for military pay or allowances.

By contract with the AEC, Sandia benefits are generally in accordance with the normal practices of Western Electric and Bell Laboratories; differential pay is the same at Sandia as it is in the Bell System. Furthermore, Western Electric and Sandia have both evidenced their support of the President's plans and objectives for strengthening the Guard and Reserve forces by going on record with the National Committee for Employer Support for the Guard and Reserve that our companies recognize the essential role of the Guard and Reserve and have policies designed to encourage employees to participate in these organizations.

Thank you for the concern you have shown in this subject. You are to be commended for your dedicated service as a civilian soldier.

—R.J. Edelman - 4200



# Take Note

John Gardner, former HEW secretary and founder of Common Cause, will speak at the UNM Student Union ballroom at 5:30 p.m. Monday, April 29. He will discuss national campaign financing. The public is invited, admission is free.

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"Windmills — Yesterday, Today & Tomorrow" is the subject of a talk to be delivered by Ben Blackwell (5628) on May 8 at 7:30 p.m. to the Albuquerque chapter of the American Meteorological Society. Location: National Weather Services office in the NOAA-FAA airport building just south of the Albuquerque Museum on Yale Blvd.

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Photographers may want to enter a competition of pictures of the Bosque del Rio Grande (between Sandia and Isleta Pueblos). It's a juried show with exhibition and prizes for top entries. Maximum of four entries — black and white and/or color prints on 16"x20" mats. Entries to (or info from): Photography Competition, c/o Elyse Dollahon, 313 Manzano NE, Albuquerque 87108.

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*A Man for All Seasons*, a modern play about Sir Thomas More (who lost his head in a dispute with Henry VIII), is the current offering of the Classics Theatre Company. Two Sandians, Bill Carstens and Phil Mead (both 3151), are in the cast; a third, John Gardner (3141), is the director. See Events Calendar for details.

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Harold Jeblick (9542) was recently installed as president of the Albuquerque Chapter of the American Defense Preparedness Association (formerly the American Ordnance Assoc.). He joined Western Electric Company in 1945 and was



GARY SHEPHERD (2634) adjusts the crown of David Morrison who plays a leading role in Gary's production of "The Emperor's New Clothes." The show is onstage tonight and tomorrow at The Neighborhood Center on 1020 Edith SE. Curtain is at 8 p.m., admission is free, and the youngsters should enjoy it.



RETIRING from Sandia Laboratories this month are (l to r) George Norris (9454), Dorothy James (4154), Ced Senter (2123), Dan Grim (1564), Ben Seely (5821) and Bill Allison (9542), seated front.

transferred to Sandia in 1954. He is a life member of ADPA, an Associate Fellow of AIAA, a senior member of ASQC and has held offices in these organizations and in the Air Force Association.

Outgoing president R.J. Hansen (4800) was presented with a scroll of appreciation for his two-year term of office.

\*\*\*\*\*

A Phi Kappa Phi invitation was recently issued to Tom Sullivan (1115). Phi Kappa Phi honors are offered only to those graduates or undergraduates with an average of 3.8 or better. Tom attends UNM under Sandia's Educational Aids Program and will receive a BS degree in EE next month. Tom is also a member of Tau Beta Phi and Eta Kappa Nu.

\*\*\*\*\*

The Sandians, an organization of wives of employees, will meet Monday, May 6, at 7:30 p.m. to elect new officers. On May 27 at 8 p.m. the group will hold its annual spring party at the home of Dian and Larry Johnson, 12400 Casa Grande NE. The Sandians seek new members. For additional information call Mary Thompson, 296-2235, or Judy James, 296-2582.

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Bob Nickell (1541) has been appointed to the editorial advisory board of the international technical publication, *COMPUTER METHODS IN APPLIED MECHANICS & ENGINEERING*. For several years, Bob has served as a reader of technical manuscripts; he will now contribute to editorial policy and will help organize symposiums.

\*\*\*\*\*

Henry Monteith (9344), moderator of the High School Symposium of the Albuquerque Public School System, has scheduled an

upcoming demonstration which he calls "sensational." Lloyd Hopkins, parapsychology researcher at Washington State, claims to have taught two young women to see without normal eyesight. The young women will demonstrate their unusual faculty on Sunday, April 28, at 2 p.m. in room 170, UNM anthropology building. A panel of scientists, including Miller Cravens (1230), Larry Bennett (9344), Elizabeth Snow (1112) and Tony Zuppero (4370), will observe the demonstration. Admission is \$2 for adults, \$1 for students.

\*\*\*\*\*

The special municipal election in which voters will elect a mayor, councilors, and judges, and decide upon a number of bond issues, will be held May 7. Persons who will be out of the city on that date can cast their vote by absentee ballot.

At this late date absentee voting by mail may be impractical: the voter first completes an application which is verified by the city clerk and then completes the absentee ballot. April 30 is the deadline for mailing a ballot to the voter following verification of the application. However, registered voters may cast an absentee ballot in person at the city clerk's office (room 707, City Hall) any time before 5 p.m. on May 3. For more information call 766-7414.

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Bob Lefever (2432) and C.J.M. Rooymans, Philips Research Laboratories, Eindhoven, Netherlands, were recently appointed joint senior editors of a new book series, *Crystal Syntheses*. Published by Springer-Verlag, the books will give recipe-like procedures for growing crystals. Materials submitted for consideration will be checked by a second laboratory. Bob says about half of the manuscripts necessary for the first volume have been received. They plan to get the book to the publisher sometime this year.

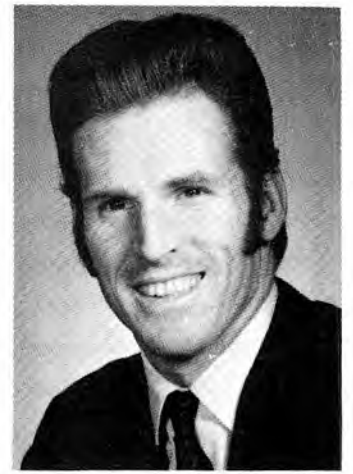


# MILEPOSTS

LAB NEWS APRIL 1974



Lawrence Bowen - 3644



20 John Helms - 8312 10



Arnold Bentz - 9482

25



Von Madsen - 8344 15



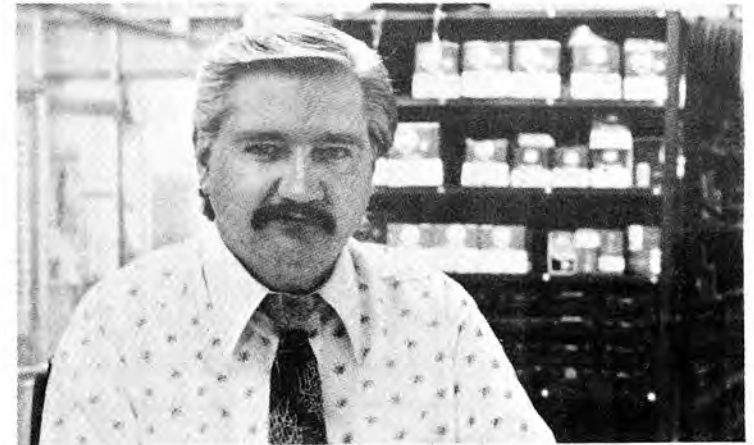
Richard Stammer - 8442 15



Herman Armijo - 8257 15



Norm Sirnic - 8254 15



Edward Gullick - 9754

10



Arnold Andrade - 8424 15



Bob Noble - 8424 20



Byron Murphey - 8300 20



Lee Davies - 8420 25



John Cowie - 9412 15



Winnifred Andrick - 2340 10



Tom Pace - 9420 25



Neita Tucker - 4154

10



Joe Sanchez - 9533 25





## Bus Notes

City Transit has ordered six new coaches. But no one is sure exactly how they'll be used when they arrive (2-3 months). That's because: 1) a consulting firm is doing a thorough study of all public transportation in the city but it's too early for the consultants to make any recommendations as to new equipment applications; and 2) the May 7 bond issue includes a \$695,000 appropriation for the Transit division (which, if passed, would make Transit eligible for some \$2.7 million in federal funds). Until the City knows the outcome of the election, it's not making any changes in bus usage.

The Employee Transportation Committee will meet with the consultants over the next few months in order to demonstrate Sandia's need for more city buses and bus routes.



REPRESENTATIVES Teno Roncalio (center) from Wyoming, and New Mexico's Manuel Lujan visited Sandia Labs last week. Herman Roser, Deputy Manager of AEC's Albuquerque Operations Office, accompanied them. The congressmen are both members of the Joint Committee on Atomic Energy.

### JUNK • GOODIES • TRASH • ANTIQUES • KLUNKERS • CREAM PUFFS • HOUSES • HOVELS • LOST • FOUND • WANTED • & THINGS

**CLASSIFIED ADVERTISING**  
Deadline: Friday noon prior to week of publication unless changed by holiday.  
A maximum of 125 ads will be accepted for each issue.

**RULES**

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Laboratories and AEC employees only
6. No commercial ads, please
7. Include name and organization
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

#### MISCELLANEOUS

6 HP SEA KING outboard motor, 8 hrs. running time, F-N-R gears, 5-gal. remote tank, \$225. Stone, 298-4620.

GARBAGE bags, \$1.75 for box of 50; girl's 20" bike, \$8. Koletar, 255-4751.

COMPUTER CONSULTANTS STOCK, 50 cents share; empty stereo cabinet, top opening, \$40. Hiltunen, 6500 Cochiti Rd. SE, Space 56.

2 TWIN SPREADS, black & white checked, \$12; boy's 20" Spyder bike, \$15; push lawn mower w/grass catcher, \$7.50. Magnani, 299-8693.

POWER MOWER, 21" reel type Toro, \$25; Clemson 18" hand mower, \$10. Rainhart, 821-3690.

305-GAL. BUTANE TANK, \$225. Sanchez, 865-9837.

CHILD'S TRIKE, \$3; high chair, \$8; rocking horse on springs, \$3. Lewis, 296-7896.

WRESTLING MAT, \$25; elec. spray gun, \$30; raise-up camper w/stove, ice box, water tank, sleeps two, \$395. Lackey, 898-5175.

RACING TRANS., 4-spd. Posimatic, band M hydraulic. Munden, 296-6724.

EAZLIFT trailer hitch & sway control, fits '67 through '71 Chev., GMC, \$80; Kelsey Hayes brake controller, \$10. MacDougall, 299-8496.

SCREEN DOOR, alum. w/hardware, 80" x 35-1/4", \$10; Sears sewing machine, port., straight stitch w/buttonholer, just serviced, \$30. wood cabinet, \$25. Franklin, 869-2130.

LAWN MOWER, Craftsman, 18", 5 blades, hand reel, w/grass catcher. Young, 256-9158.

TWO 16.5 HD camper wheels, 8-1/4" wide 6-hole Chev. w/hub caps, \$30. Baca, 256-2881.

ALFALFA HAY, never wet,

\$2/bale, 13-yr.-old mare, gentle w/children, \$125. Shock, 877-3728.

24" COLOR console TV, 37" wide, pecan wood, \$275. Mueller, 299-1079.

CANON f-1 camera & case w/f1.4 FD lens, \$350. Vivian, 299-1785.

TOMATO PLANTS, Beefsteak type, 6/75 cents, \$1.40 dz. Kroth, 4605 Sherwood NE, 293-9565.

POOL, used 1 summer, all alum. w/vinyl liner, 8' dia. x 20" deep, \$15. Lockwood, 298-9563.

VOLKS auto tires, used, 5:60x15, four for \$14; \$4 ea. Joseph, 299-6989.

POST HOLE DIGGER, Craftsman 3hp w/6" earth auger, \$125. Cordova, 344-3110 after 5.

LABRADOR retriever pups, black, litter reg., excellent bird dog or gentle pets for children, various prices. Hueter, 842-5482, or 242-1620.

2 SWIVEL CHAIRS, matching couch, black vinyl, chrome pedestal bases, new, \$160. Paul, 299-6387.

4-CHANNEL AM/FM receiver; 8-track player; cassette recorder/player; turntable; 4-speakers, Sanyo, \$450 new, negotiate. Silva, 255-1710.

BIKE CARRIER, heavy duty type, \$15. Hudson, 296-3484.

AIREDALE AKC reg., top blood lines, 2 yrs. old, male, \$75 or best offer. Aubuchon, 865-7790.

'71 14x60 VINTAGE mobile home, 2-bdr., house-type door & windows, AC, range, refrig., furnished or unfurnished, \$650 down, assume payments \$115, 7%. Babb, 821-4423 after 6.

TRUMPET, student, used, w/case, \$100. Sample, 296-1771.

REFRIGERATOR-FREEZER, 14 cu. ft., frostless, Coldspot, \$175; colonial style rocker, maple, \$35. Dalphin, 265-4029.

INSPECTION LIGHT & magnifier, dazor floating fixture model M-209, new, \$30. Hall, 268-4825.

EVAP. AIR COOLER, 3/4 hp motor, metal side panels for winterizing, \$25. Piper, 298-2053 after 5.

FLUTE, open hole Gemeinhardt "C", \$250, appraised by Farleys, 8907 Los Arboles NE. McIlroy, 299-4977.

14' TRAVEL TRAILER, dual 7-1/2 gal. gas bottles, gas heater, 20-gal. water tank, new tires, sleeps 6. Snyder, 268-0679.

SWING SET, \$20; cartop carrier, \$7; boy's 26" bike, \$10; ironing board, \$6; ceramic tile. Stewart, 268-2786 after 5.

SPEAKERS, Marantz Imperial, 7, 12" woofer, pair \$300; Gibson mandolin, A-50 w/case, \$325; left-hand golf clubs, bag, cart, \$80. Perryman, 294-7040.

ENGINE, '63 Renault, 52hp w/radiator, generator, starter, running condition, \$75; tires, 7:75x14, 4-ply, \$5 ea., 4 for \$18. Bassett, 898-1840.

GE DRYER, \$50. Tichhauser, 293-9768.

TRAVEL TRAILER, '65 Banner 17', fully self-contained w/AC. Smathers, 298-0613.

RCA VICTOR B&W 23" console TV, 6 yrs. old, make offer. Chinn, 296-5172.

WASH BASIN & water closet w/hardware, \$30 set. Malone, 255-3766.

COOKING TOP for built-in stove, Frigidaire; has 4 burners, brand new, still in box. Causey, 299-0089.

TEMPORARY UTILITY POLE, 40 amp, \$40. Hansche, 281-5350.

STAINLESS STEEL Thermador four-burner & griddle cook top, \$50; Westinghouse wall oven w/timer, \$50. Hobbs, 268-6461.

WARDS Western Field camping trailer, sleeps 4, foam mattresses, carpets, \$325. Sefcik, 7405 Gladden NE, 298-5109.

BUNK BEDS w/mattresses, \$35; Wards port. typewriter, 4 yrs. old, \$35. Schubeck, 266-2780.

SWAN 117XC power supply, \$75. Richardson, 268-7843.

COMPLETE US DIVERS equipment; suit, tank, pack, reg., knife, depth gauge, hp gauge, etc.; UW Nikonos II, UW flash, UW exposure meter, all half price. Cundiff, 256-0043, 5905 Constitution NE.

BUCKET SEATS, 2, black vinyl; '66 Chevy hood, door, windows, best offer. Cook, 294-2348.

DOUBLE BED w/box springs & mattress. Filusch, 299-5932 after 5.

#### TRANSPORTATION

GIRL'S 26" bike; 2 boy's 26"

bikes, \$10 ea. Chavez, 242-9140.

'67 SUZUKI 250cc X6 Scrambler, new tires, chain & battery, top end overhaul less than 2000 miles ago, \$300. Greenholt, 294-5286.

'73 MONTE CARLO, bronze w/cream vinyl top, AC, PS, PB, AM w/8-track stereo, steel-belted radials, loaded. Walters, 298-6343.

'67 OPEL, 30 mpg in town, needs windshield, \$475 or best cash offer. Yanez, 296-0804.

'53 STUDEBAKER, classic, HT, parts car, \$100. Damon, 268-5307.

'72 DELTA-FORD 19' motorhome, self-contained, 12 mpg, \$5500 or make offer. Gustin, 256-3807.

'71 1/2TON pickup, swb, 4-spd., V8, \$1300 or best offer; camper shell for swb, \$250. Aragon, 266-8597.

'70 TOYOTA Corona, 4-dr. sedan, auto., 34,000 miles, 26 mpg. Edgar, 255-4384.

SAILBOAT, Venture 17, small cabin cruiser, sleeps 4, includes motor, trailer, all accessories, ready to sail. Adams, 247-9688.

'71 SUZUKI model 50, 2600 miles, best over \$100. Perea, 255-6902 after 5.

'71 VW std., 32,000 miles, one owner, marina blue, \$1700. McGee, 299-0661.

'72 DATSUN pickup w/insulated camper shell, 24,000 miles, R&H, \$2350. Arnold, 898-4140 after 5.

'72 CHEVY NOVA, blue, 2-dr., 6-cyl., std. trans., R&H, low mileage, \$2000. Evans, 268-7039.

'72 GRAN TORINO sport, automatic, power, air stereo, mag wheels, \$2500. Rufsvold, 268-5970.

'72 KAWASAKI 500, 7000 miles. Galloway, 255-0262.

BIKES: girl's 24", \$20; man's 3-spd., \$35. Reynolds, 299-7267.

'68 CHEVROLET Suburban, 6-cyl., 292 engine, 4-spd. trans., \$1200. Claghorn, 298-2043.

'71 CHEVY 3/4-ton pickup, new tires, extra wheels; 8' cab-over "Six Pak" camper, camper jacks; below NADA book. Stanley, 268-9537.

#### REAL ESTATE

DUPLEX: lg. 2-bdr., all elec. built-in kitchen, new roof, good

condition; near bases & shopping, \$26,500, terms flexible, NE. Duvall, 255-4678 evenings.

4-BDR., den, formal dining, many extras, 7% GI, 12621 Viewcrest NE, \$42,500. Montoya, 293-3611.

4-BDR. 2-1/2 baths, storage, extras, country but close, 2.16 acres, appraised \$66,500. Barker, 299-1483.

TWO 1 acre lots Brazos Lodge area, \$2900 ea., terms negotiable. Lassiter, 298-2461.

#### FOR RENT

2-BDR. furnished house, near UNM. Picraux, 265-4192.

UNFURNISHED 4-bdr. house, utilities paid, \$230/mo., \$25 deposit, avail. 4/30, 416 Rhode Is. SE; furnished 1 bdr. house, no pets, utilities paid, \$90/mo., 204 San Pablo SE. Dodson, 255-0265.

SUMMER RENTAL: adobe on 10 acres, 20 mins. from downtown. Johnson, 867-5849.

3-BDR., carpeted, walled, garage, \$160/mo., water paid, first-last & \$100 deposit. Shaut, 299-8569.

#### WANTED

WEIGHT LIFTING & exercising equipment. Fisher, 299-9235.

TENT, less than \$20. Basham, 821-5732.

METAL LATHE, suitable for motorcycle parts. King, 298-2991.

DRUM SET, will pay cash. Adent, 293-3715 or 345-9393.

FURNISHED HOUSE for summer faculty, husband & wife, no children or pets, approx. June 15 to Sept. 1. Hughes, 266-6747.

SHOP MANUAL for '65 Dodge, either company manual or "motor" manual. McGuckin, 299-1342.

JEEP, CJ5, very good body & running gear, motor unimportant. Stevens, 299-6086.

SUCTION PUMP for shallow well, 1-2" pipe. Schroeder, 344-1011.

SMALL Day Sailer sailboat; unheated honey. Westman, 255-6048.



● FOOTBALL ● GO-GO ● FREDDIE WILLIAMS ● AUSTRIA ● DENNY ● GOURMET ●

FRIDAY	SATURDAY
26 - HAPPY HOUR GOURMET MENU (See Below) Adults \$2.50 Under 12 \$1.50 FREDDIE WILLIAMS Lounge Denny	27 - TEEN GO-GO MAGIC MOUNTAIN S.Q. LEE 7:30 - 10:30 (See Below)
3 - HAPPY HOUR ITALIAN BUFFET (See Below) SOL CHAVEZ Lounge Denny	4 - SANADO BALL HIGHLAND FLING Sanado Members Only

**FANTASTIC** — Super Gourmet Happy Hour tonight. Dinner begins at 5. Dancing from 8:30 to 11:30 with Freddie Williams, imported from Denver, the music maker. Denny too. And it's a gourmet feast: roast top round beef *au naturel*, chicken cacciatore, baked ham, mostaccioli Milanaise,

escalloped potatoes, zucchini parmesan, plus the extras. Duplicate that spread for \$2.50 anywhere else and you're a culinary-financial genius.

**FOOTBALL** — In Spring? Yes. UNM has provided a batch of \$1 tickets to the Lobo spring game at 7:30 tomorrow. Buy tickets this evening or tomorrow morning at the Club office.

**ROMANTIC** — May 3 is the start of a series of new style buffets — soft lighting, soft music, lots of food choices. For example, the Italian Buffet includes chicken Vesuvio and Italian sausage, spaghetti and buttered zucchini, plus the trimmings.

**NEW** — To Sandia? To Albuquerque? Sandia and AEC new hires get an automatic

three-month membership in the Coronado Club. Find out the benefits by calling the Club office before your three months are up. (For example, the Club has the best swimming opportunities in town — unless your membership lapses.)

**NOW** — Pick up tickets for your teeners for the Go-Go tomorrow night, 7:30 to 10:30. Or accompany them there then. Or they'll miss Magic Mountain and MC/DJ Sabastian Q. Lee.

**LAST CHANCE** — The Austria trip deadline is May 1. But sign up before 8 tonight and be eligible for a free trip; drawing is tonight after 8. August in Austria, anyone else?

MORE INFO — 265-6791.

SOL CHAVEZ ● C-CLUB ● HAPPY HOURS ● MAGIC MOUNTAIN ● LEE ● ITALIAN

**Speakers**

- G.C. McDonald (9623), "Energy vs. Environment — An Overview," Albuquerque Section, IEEE, March 25.
- R.M. Jefferson (1721), "The Current Power Crisis," Eldorado High school science survey class, March 27.
- J.L. Gardner (3141), "The Written Word as Expressed in Drama," West Mesa High School English class, March 29.
- J.E. Schirber (5151), "Pressure Studies of Superconducting Palladium Hydrides," Seminar, Univ. of Colorado, March 7, Boulder; and "Pressure Induced Electron Transitions," Seminar, Colorado State University, March 8, Ft. Collins.
- R.G. Dosch (5824), "Analytical Chemistry Associated with Solidification and Disposal of High-Level Radioactive Waste," Invited seminar, Dept. of Chemistry, UNM, March 8.
- B.L. Hulme (5122), "Some Mathematics of Archimedes," Eldorado High school, March 11.
- W.P. Bishop (4761), "Underground Wilderness: A Scientist's Viewpoint," N.M. Conservation Coordinating Council, March 12, Albuquerque.
- C.E. Land (5113), "PLZT Electrooptic Effects and Device Applications," UNM Combined Optics and Optoelectronics classes, March 14.

- R.A. Langley, S.T. Picraux (both 5111), and F.L. Vook (5110), "Hydrogen Distribution Profiling"; L.C. Beavis, R.S. Blewer, J.W. Guthrie, E.J. Nowak, and W.G. Perkins (all 2413), "The Formation and Properties of Rare-Earth and Transition Metal Hydrides"; C.J. Northrup, Jr. and R.P. Wemple (both 5324), "The Vanadium-Hydrogen System at High Pressures"; D.O. Lee and W.H. McCulloch (both 1543), "Solar Energy and Hydrogen Production - An Examination of Two Possible Systems"; J.A. Panitz (5114), "The Crystallographic Distribution of Hydrogen on Catalytic Surfaces"; A.C. Switendick (5151), "Hydrogen in Metals — A New Theoretical Model"; G.E. Laramore, J.E. Houston and R.L. Park (all 5114), "Catalytic Combustion of Hydrogen"; J.E. Schirber (5150), "Effect of Pressure on the Superconducting Transition Temperature for PdH," The Hydrogen Economy Miami Energy Conference, March 18-20, Miami Beach, Fla.
- J.M. Hueter (3131), "The Academic-Industry Marriage as Viewed by the Technical Employer," Univ. of Cincinnati Cooperative Education Institute, March 28, Los Angeles.
- M.L. Knotek (5155), "In-Situ Transport Measurements on UHV Grown a-Ge"; D. Emin (5155), "An Exact Calculation of the Phonon-Assisted Jump Rate," Tetrahedral Bonded Amorphous Semiconductors Conference, March 20-22, Yorktown Heights, N.Y.

- P.M. Richards (5132), "Magnetic Resonance in One- and Two-Dimensional Compounds," Solid State Physics Seminar, March 22, Univ. of Illinois.
- E.J. Graeber (5825), "Microfilm Simulation of X-Ray Powder Patterns"; B. Morosin (5154), "The Crystal Structure of Uranyl Acetate Dihydrate, UO<sub>2</sub>(CH<sub>3</sub>COO)<sub>2</sub>·2H<sub>2</sub>O," American Crystallographic Association Meeting, March 25-29, Berkeley, Calif.
- R.E. Luna (5644), "Air Quality Modeling for Albuquerque," Mechanical Engineering Seminar, UNM, March 25.

- S.T. Picraux (5111), invited talk, "Mass Transport Between Two Metal Layers as Studied by Ion Scattering"; D.M. Mattox (5526), "Recent Advances in Ion Plating," 6th International Vacuum Congress, March 25-26, Kyoto, Japan.
- B. Morosin (5154), "Prediction of the Trioctahedral Mica Structure at High Temperature," and "Crystal Structure of Phyrzine Copper Acetate," American Crystallographic Association Meeting, March 25-29, Berkeley, Calif.

- J.A. Panitz (5114), "The Characterization of Catalytic Surfaces by Single Atom Mass Spectroscopies," National Center for Energy Management, Univ. of Pennsylvania, March 27, Philadelphia.
- A.R. DuCharme (5156) and R.L. Gerlach (Varian Associates), "L-Shell Ionization Threshold Structure from Auger Electron Spectra"; R.L. Park, J.E. Houston and G.E. Laramore (all 5114), "Comparison of Many-Body Effects in Core Level Surface Spectroscopies," 2nd International Conference on Solid Surfaces, March 25-29, Kyoto, Japan.

- C.E. Hackett (5642), "Laser Doppler Velocimetry (LDV) in Chemical Laser Studies," Laser Velocimetry Workshop, Purdue Univ., March 27-29, Lafayette, Ind.
- E.E. Ritterbush (4210), "Direct Employer Involvement in Establishing HMOs," HMO Conference, March 28-29, Chicago.

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- W. Beezhold (5112), "An Ultrahigh Vacuum System for Ion-Induced Characteristic X-Ray Analysis," Vol. 19, No. 2, THIN SOLID FILMS.
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**Sympathy**

- To Harold Thomas (9341) on the death of his father.
- To Charles Jennings (2433) on the death of his wife April 9 in Albuquerque.
- To Art Cole (9486) on the death of his wife April 12 in Albuquerque.

