Nuclear Reactor Neutrons Used to Produce Laser Beam

PRINCIPAL INVESTIGATORS on the reactor-pumped CO laser, Phil Tollefsrud, left, and Dave McArthur of Dep't. 5220 are shown with the laser, upper right, and a mockup of the SPR III, Sandia's newest pulsed reactor. This is believed to be the first laser produced by pumping with fission products.

Sandia researchers have produced a laser beam by exciting carbon monoxide with high energy atoms from a nuclear reaction, opening the possibility that nuclear reactors and lasers can be combined to produce electric power.

Big advantage of using a reactor to produce laser beams is that very large amounts of energy can be delivered to large volumes of laser material. In addition, energy stored in the nucleus of an atom can be released more simply and more efficiently than can the energy in complex power supplies being developed to pump large, conventionally-excited lasers.

The Sandia laser is believed to be the first ever produced by exciting a lasing medium — carbon monoxide — with fission products from a reactor, although various laboratories have worked on such programs since the early 1960's.

Sandia researchers began their first studies about two years ago, using one of the Labs powerful pulsed reactors. A beam was subsequently produced and AEC has filed a patent application on the new laser.

Work on the new laser has been conducted by Dave McArthur and Phil Tollefsrud, both of Simulation Sciences Research Department, 5220.

The new laser is simple in construction, consisting basically of a metal cylinder lined with a thin coating of enriched uranium (U-235) and filled with carbon monoxide. Mirrors are located at both ends of the cylinder, which is placed in an open container of liquid nitrogen to keep the laser gas at a temperature of about minus 335°F.

The container, with the cylinder inside, is positioned adjacent to the reactor core. When the reactor is pulsed, neutrons — about 100 quadrillion (a "1" with 17 zeros) per square centimeter per second in a pulse lasting 40 millionths of a second — emerge from the core and strike the cylinder.

Within the cylinder, the neutrons collide with nuclei in the atoms of U-235, splitting each atom into two high energy atoms which then strike the gas molecules.

The collision of atoms and molecules elevates the molecules to an excited energy state, and when these excited molecules decay

(**Continued on Page Two**)

$5.9 Million Program

New Construction Projects at Sandia Laboratories

Construction crews working in the area between Bldgs. 802 and 804 are installing a landscaped mall which will include exposed aggregate concrete paving with planter boxes for trees and shrubs. It's one of the more visible aspects of Sandia's current $5,900,000 construction program.

The new mall is a small part of the Sandia master construction plan which calls for removal of temporary buildings and additional landscaping throughout Area I. The current mall construction is using contingency construction funds left over from FY '73 projects. Funds for the project do not come from the current operations budget. This area was previously used for a sub-motor pool which has been eliminated. The landscaping will help control dust and provide an attractive area requiring minimum maintenance in this high volume traffic location. It should provide a pleasant and attractive place during moderate weather for employees who bring their lunches.

Most of the construction now underway at SLA is not visible — it includes numerous modifications to interiors of buildings such as the new air conditioning system for Bldg. 840, new laboratory areas in Bldg. 893 which will house laser fusion studies, and water system improvements in Area III. Others include a fire protection sprinkler system for Bldg. 6580 in Area V and modifications in Bldg. 894 for a battery development lab.

Recently completed is an addition to Bldg. 841 to house a new microcomponents assembly area.

Also under construction are new buildings in the remore test areas:

— Hypervelocity range building in Coyote Test Field, cost $115,000

— Small arms addition (for impact testing) to Bldg. 6750 in Area III, cost $57,000

— Explosive Assembly Bldg. 9832 in Coyote Test Field, cost $110,000

The total value of current construction in progress at Sandia is about $3,000,000. Projects under design are estimated to cost about $2,900,000. These include:

— Microelectronics laboratories and clean rooms for Bldg. 870, estimated to cost $1.5 million

— Composite materials and ceramics research lab in Bldg. 894, estimated at $480,000

— Addition to Bldg. 6588, estimated at $150,000

— Vacuum lab addition to Bldg. 880, $115,000

— Modification to Bldg. 864 for the Scientific Glass Lab, $450,000

— Air conditioning modifications to Bldg. 860, $120,000

— Addition to Bldg. 6597 for assembly area for electron beam generators, $233,000

These projects are for Sandia/Albuquerque; at Livermore a $3 million aerostatics building and additions to the maintenance shop, $150,000, and a gas dynamics facility, $240,000, are under construction.

Supervisory Appointments

DUB NORWOOD to supervisor of Contract Audit Division 4121, effective Oct. 1. Joining the Labs in 1952, Dub worked with the cost accounting group for about three years, then transferred to systems and procedures department and, since 1963, has been with the auditing group.

Before coming to Sandia Dub earned a bachelor's degree in business administration from UNM and served two years in the Army with a tour of duty in Europe. Off the job Dub's favorite activities are boating and — depending on the season — water skiing or fishing; favorite site for these pursuits is Lake Powell.

Dub and his wife Joyce have five children, two still at home, and the others living in the Albuquerque area. The Norwoods live at 14232 Mocho NE.

* * *

CALLA ANN PEPMUELLER to manager of Technical Library Department 3140, effective Oct. 1. For the past 11 years Calla Ann has been assigned to the library where she has supervised the Book and Report Cataloging Section, the Reference Section and, since 1970, the Library Reference and Periodicals Division. Her initial employment with Sandia began in 1956 and terminated six years later when she left to continue her education.

Calla Ann earned a BA degree in biology from Lake Forest College (Ill.) and an MS in library science from Western Reserve College in Cleveland. She is a member of the Special Libraries Association, the American Society for Information Science, and past president of the New Mexico Library Association. She recently completed a term as chairman of the Governor's Advisory Council to the New Mexico State Library.

The Pepmuellers (Arlin, manager of department 3720) live at Three Arco NW.

* * *

CECIL PAGE to supervisor of Test Assembly Section 9484-1, effective Sept. 1. Since coming to Sandia in August 1949, Cecil has worked seven years in drafting, eight years in tool made sample evaluation, four years in advanced manufacturing development and, since 1969, has been with his current organization — Mechanical Design and Test Assembly Division. Cecil worked on the Manzano Base project for the Corps of Engineers before joing the Labs. He served three years in the Air Force during WW II.

Skiing, hiking and balloon chasing are popular activities with the Page family. Cecil and his wife Lois have three daughters — Nancy attends Manzano HS, while Susan and Janie attend UNM. Their home is at 1308 Somervell NE.

Cecil Page (9484-1), Dub Norwood (4121), and Calla Ann Pepmueller (3140).

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&
lorena schneider reports on livermore

Continued from Page One

Neutrons Produce Laser Beam

back to their normal ground state, they give up their excess energy as photons, or light particles.

The photons constitute the laser beam, which is reflected back and forth between the two mirrors until it is strong enough to pass through the exit mirror, emerging as an intense, highly-directional beam.

The beams produced thus far have been of low power — only two to six watts — and the laser is quite inefficient, with beam energy being less than one percent of the energy deposited in the gas by the fission fragments.

However, no effort has yet been made to maximize the output of the laser, and the researchers feel that the laser, or perhaps one similar to it which uses a different gas, could be made quite efficient.

"There is a great deal more research to be done in this field," says Jack Walker, manager of the Simulation Sciences Research Department, "but early data indicate that surprisingly high efficiency might be possible.

"Our preliminary results suggest that the efficiency of this energy conversion process could be greater than 50 percent — meaning more than 50 percent of the fission energy deposited in the gas by the U-235 fragments could be converted into laser light. This is a very high efficiency for almost any energy conversion system — power plants, gasoline engines, etc.

"We feel that neutron-pumped lasers could have great potential in heating plasmas used in magnetic confinement fusion power plants or even in imploding fuel pellets for laser fusion power plants if short laser pulses can be generated."

In the immediate future, the Sandia researchers suggest that experiments be conducted with greater neutron fluxes, that various elements of the lasers — gas, mirrors, etc. — be optimized to increase beam energy, and that more data be gathered to determine the actual efficiencies involved in the new concept.

They also suggest that reactors could be designed especially for laser excitation, leading the way to large, relatively inexpensive pulsed lasers.

LIVERMORE NEWS

VOL. 26, NO. 21 LIVERMORE LABORATORIES OCTOBER 11, 1974

Take The Bus And Breathe Easier

Joe Darginis

Jan Vandermolen

Wes Estill

Bus service from Livermore to the Laboratories has been in operation for about six weeks now, and so far the results are disappointing. The operators are drawing about 1.4 percent of a potential 3700 commuters. Only 10 regular riders are Sandians, while a pre-bus survey indicated at least 38 would definitely use the service.

Air pollution in the valley so far this year has exceeded federal safety limits on 77 days, and the federal maximum is often doubled. Further, two-thirds of the valley's air pollution comes from local sources.

Operators of the new bus service have revised their routes and shortened the time per run to make the service more attractive. Also, they are offering a commute ticket which gives 11 rides for the price of 10. This reduces the cost to 22¢/ride east of Livermore Avenue and 36¢/ride west of Livermore Avenue.

We asked three regular passengers why they bus to Sandia.

Joe Darginis (8313) — I had planned to ride only one day a week so that my wife could use the car, but the bus is so convenient and comfortable that I decided to ride it every day. One of the real pluses is that it gives me a chance to relax, especially on the trip home in the evening.

Jan Vandermolen (8100) — Livermore needs a bus service and you can't have one unless you support it. The cost is no more than it would be to drive. It is very convenient. I enjoy the relaxing ride.

Wes Estill (8314) — It's cheaper and riding helps reduce pollution. I have to walk a few blocks to the bus stop, but I enjoy the walk. One other comment: Triple A says it costs 17¢ a mile to operate a second car and if each Sandian would use the bus only one day a week the operation would be a success.

Attention Bridge Players!

Sandia/Livermore's noon-time bridge players will get a chance to renew their rivalries on Wednesday evening, Nov. 6, when SLL's second annual bridge tournament gets underway. It's part of the National Industrial Recreation Association's Postal Duplicate Bridge Tournament. The event will be held at the Sun Valley Mobile Estates' recreation center in Livermore beginning at 7:30 p.m. Admission is free.

Each bridge hand, once dealt, is played at all tables so that results can be compared. A certified duplicate bridge director will be present to oversee the tourney. Active or retired Sandians and their immediate families, as well as contractor personnel, are eligible.

Door prizes will be awarded and trophies will go to the winning pairs playing north/south and east/west positions. Winners will also be eligible for 18 regional prizes and four national prizes including a Jamaican vacation for two.

To participate, contact Frank Cupps (8265), ext. 2547; Pat Leary (8322), ext. 2049; or Herb Turnbull (8323), ext. 2179. Partners will be arranged for singles.

Congratulations

Mr. and Mrs. George Samara (5130), a daughter, Victoria Ann, Sept. 19.

Mr. and Mrs. Rich Schmidt (5163), a son, Adam Christopher, Sept. 28.

Authors

Jim Shelby (8334), "He, D^2, and Ne Migration in a Common Borosilicate Glass," JOURNAL OF APPLIED PHYSICS, Vol. 45, No. 5

Jim Shelby (8334) and Rick Wayne (8365), "Gas Migration in Vitreous B^2O^3," JOURNAL OF APPLIED PHYSICS, Vol. 45, No. 6

Bob Gallagher (8333) and Prof. J. B. Fenn (Yale University), "Rotational Relaxation of Molecular Hydrogen" and "Relaxation Rates from Time of Flight Analysis of Molecular Beams," JOURNAL OF CHEMICAL PHYSICS, Vol. 60

Bob Huddleston (8332), "On the Conditional Equivalence of Two Starting Methods for the Second Algorithm of Remez," MATHEMATICS OF COMPUTATION, Vo. 28, No. 126

Ron Musket (8334), "Detection of Proton-Induced Boron X-rays with a Si(li) Detector," NUCLEAR INSTRUMENTS AND METHODS, Vol. 117, No. 385

Bob Schmieder (8342), "Characteristic X-rays from Xenon Ions Trapped in an Electron Ring," PHYSICS REVIEW LETTERS, Vol. 47A, N415.

Mike Baskes (8341), "The Prediction of KIc from Tensile Data," ENGINEERING FRACTURE MECHANICS, Vol. 6, No. 1

Rand German (8312) and Z. A. Munir (UC/Davis), "A Correlation Between the Pilling-Bedworth Ratio and the Radius of Curvature of Metallic Substrates with Coherent Thin Oxide Layers," OXIDATION OF METALS, Vol. 8, No. 3

John Brooks (8314), "Progress Toward a More Weldable A-286," WELDING JOURNAL — RESEARCH SUPPLEMENT, Vol. 53, June 1974

Jack Dini and Rudy Johnson (both 8312) and Gary Beeler (8157), "Nondestructive Testing of a Plated Aluminum/Stainless Steel Joint," MATERIALS EVALUATION, June 1974

Sympathy

To Bill Irwin (8421) on the death of his father-in-law in Wildwood, N.J., Sept. 13.

Supervisory Appointment

Tim Cody to supervisor of Second Shift Computer Operations Section 8323-2, effective Sept. 1.

Joining Sandia in Sept. 1963, Tim was a special messenger in the mail room and a key punch operator. After a year, he left Sandia to become self-employed in the flooring business. Returning in Dec. 1965, he worked as a taxi driver, microfilm camera operator, library assistant and tape librarian in the computer organization. In 1968 Tim became a computer operator and in 1972 was promoted to an ESA as a computer systems programmer.

Tim received an AA degree in mathematics from Chabot College in June 1970. He served in the California National Guard for six years and is the present chairman of the Livermore Beautification Committee. He is also an antique car buff.

He and his wife Carolyn, a former Sandian, live on Rincon Avenue in Livermore.

Dinner Dance Set for Nov. 23

Castlewood Country Club is the scene of Sandia's "Une Soiree Dansante" on Nov. 23. The French theme features delicate handmade decorations to accent the festivities.

Chaired by Mrs. Thomas (Virginia) Cook and assisted by Evelyn Bachman (8265), Mrs. Lee (Helen) Davies, Barbara Carter and Jim Henderson (both 8214), the dinner dance has been planned to usher in the coming holiday season with a party that all Sandians can enjoy. The committee promises an outstanding dinner, one equal to that of the great restaurants of San Francisco, and wine will be served with the dinner. Selection of the menu was made with great care. Music of Larry Cabral's orchestra will range from waltz to watussi, and from rock to rumba.

In this era of high prices it is difficult to find a bargain such as this which offers a complete evening of entertainment for such a low price.

The price is right and early reservations are a must, so call Barbara today, ext. 2254. Seating at Castlewood is limited.

SKETCH shows Project da Vinci crew gathering atmospheric data. Sandia Labs is performing systems engineering for the project as well as providing telemetry, communications and ground support. Launch is scheduled Oct. 19 from Las Cruces airport.

Project da Vinci

Manned Balloon Launch Set Oct. 19

Systems engineering, the complex job of integrating 25 scientific experiments, some 48 sensors, power supplies, telemetry, timers, recorders and other equipment is the job performed by Sandia Laboratories for Project da Vinci. The work is centered in Division 1255.

The Project is a manned and instrumented balloon flight, lasting 36 hours; the balloon will drift at altitudes between 4000 and 14,000 feet from launch at Las Cruces Airport to landing in western Texas. Liftoff is scheduled for 7 a.m. Saturday, Oct. 19.

As the four person crew conducts the scientific experiments, data will be telemetered to Sandia recording facilities first at Las Cruces Airport, then to White Sands Missle Range and then to mobile equipment east of the Sacramento Mountains. A number of chase vehicles, manned by Sandians, will also take part in the operation.

Project da Vinci is jointly funded by the AEC, National Geographic Society and the Army's Atmospheric Sciences Laboratory. Some 15 other organizations are providing scientific experiments.

Aim of the experiment is to draw a comprehensive picture of a single air parcel as it crosses mountains, open plains, forests and cities. The altitudes at which the experiments are conducted include that portion of the atmosphere most critical for dispersion of pollution. Simultaneous measurements will be made of temperatures, humidity, gravity waves, electrical field particles, ozone, sulpher dioxide pollution, and other atmospheric constituents.

More than a ton of scientific equipment and 700 pounds of life support, navigation and radio equipment will be aboard the gondola. Crew members are: pilot, Jimmie Craig, civilian employee of the U.S. Navy; co-pilot, Vera Simons, research balloonist and artist; on-board scientist, Rudolf Engelmann, USAEC Division of Biomedical and Environmental Research; and photographer, Otis Imboden, National Geographic Society.

The 70-foot da Vinci balloon, filled with helium, will carry a total pay load of almost 5000 pounds.

SIR HERMANN BONDI, Chief Scientific Advisor to the British Ministry of Defence, looks on (left) as President Sparks discusses agenda for the day. At right is Mr. Edward Newley, Director, AWRE. Sir Hermann addressed Labs colloquium on "Gravitational Theories and Relativity." Later the UK group received briefings on Labs programs.

Audubon Wildlife Films

The Audubon Wildlife Film Series opens its fifth season next month at Popejoy Hall, UNM. The film programs are sponsored by the Central New Mexico Audubon Society, the New Mexico Mountain Club, and the Rio Grande Chapter of the Sierra Club. Bill Stamm (9743), president of the board of directors for the Audubon Wildlife Film Series, Inc., says past series have been well attended and have enabled the group to contribute funds and materials to ecology-oriented projects, the Albuquerque Public Schools, and the Albuquerque Zoo.

The 1974-75 schedule follows:

Oct. 23 — Fran William Hall, wildlife photographer, presents "Small World" — sequences on the daily lives of some of the smaller creatures, particularly insects.

Dec. 8 — Richard Kern's exploration of "Florida's Cypress Sanctuary: Fisheating Creek."

Jan. 15, 1975 — Tom Sterling presents a trip through "Twentieth-Century Wilderness" — explores the many varieties of wilderness in the U.S.: prairies, canyons, high mountain country, and the Everglades.

Feb. 28, 1975 — San Schippers' and Henk Kegel's "Animaux Sauvages" (Wild Animals). This film — a study of some of the wild creatures of Africa — was named the best educational documentary at the 1971 Cannes Film Festival.

March 27, 1975 — "Palm Springs to Lake Louise" — Norm Wakeman films five months of spring in the western U.S. and the Canadian Rockies. He follows the season through the southern California desert, the Sierra, northern California and Cascade Range, to Crater Lake in southern Oregon, Grand Teton National Park, Yellowstone, Glacier National Park and, finally, to Lake Louise in Canada.

Season tickets may be purchased from the Audubon Wildlife Film Series, P.O. Box 3457, Albuquerque 87110. They are good for five admissions, single or in any combination of showings: adult - $5.50 (persons over 65 years old - $4.50), and student - $3. Single tickets may be purchased at the Popejoy Box Office or at the door: adult - $1.50, student - $1.

Congratulations

Mr. and Mrs. George Samara (5130), a daughter, Victoria Ann, Sept. 19.

Mr. and Mrs. Rich Schmidt (5163), a son, Adam Christopher, Sept. 28.

Sympathy

To Melvin Olman (1653) on the death of his mother in Grand Rapids, on Sept. 20.

To William Meahl (9343), on the death of his sister, Oct. 6.

Take Note

Howard Seltzer (9654) reports that the U. of Albuquerque is sponsoring a 21-day tour of northern Europe and the Soviet Union which will depart from Albuquerque on June 14, 1975. For student members of the tour, high school or college credits can be arranged. The group will travel through Paris, Copenhagen, Stockholm, Helsinki, Leningrad, Moscow, Minsk, Warsaw and Berlin. In addition, two other European itineraries will depart at the same time., i.e. June 14, 1975; limited number of tour openings is available to Sandians and their families. Contact Howard at 299-0284 after five if you're interested.

* * *

Frustrated because you couldn't walk around the end of the Tech Area fence out by the Science Exhibit Center? Try again. Since the construction planned for the recently fenced-in area has been delayed, Plant Engineering has opened a pedestrian walkway next to the Tech area fence, saving a good deal of walking for those meeting carpools or biking around the outside of the area. No motorized vehicles may use the temporary openings.

* * *

Nick DeLollis (5813), conversationalist, river-runner, bon vivant, also a chemist, has a new passion — the Club Culturale Italiano, a local group which, if you haven't figured it out, is dedicated to things Italian, like the arts, food, wine and other great Italian pastimes. Nick announces that on Sunday, Oct. 20, the CCI is sponsoring a marathon spaghetti dinner, from noon to 7 p.m., at the St. Charles Borromeo Church 1818 Coal Pl. SE; the tab is $2.50 a head, children are cheaper, and you get Italian sausage and dessert, maybe even a touch of la dolce vita. You can get tickets from Nick, Tony Veneruso (5721), Dan Alvino (9611), or at the door of the event.

* * *

From Sandia at Pantex, Bill Sherman reports that the division (9524) once again has 100% participation in the Amarillo United Way fund. Bill's group has 89.4% fair share, an improvement of 3% over last year.

CU Bulletin Board

The tire that goes bang — If you own a '67 to '73 auto you may also own the so-called "space saver" spare tire. It's carried uninflated, thus takes up less space in the trunk, and comes with a pressurized canister which is used to inflate the tire when it has to be used. And that's where trouble may begin. Sixteen serious injuries, including two fatalities, have occurred when the space saver tire exploded and separated from the rim while being inflated. If you're a lucky owner, avoid inflating or using the space saver until you can get instructions from the manufacturer (B.F. Goodrich) or the tire has been checked out by an authorized dealer. LAB NEWS has a list of automobiles for which the space saver was standard equipment; come over and check it if what we said above makes you nervous . . .

IT'S METRIC — first all metric job out of the machine shop was completed by Jim Myers (left) and Joe Shelby (both 3644-2). The unit, a vacuum chamber with a turret mechanism to hold samples (on top)/(held by Joe), "proves that even a guy with 36 years of working with inches can adjust to millimetres," says Joe. Adds Jim, "We're getting more metric tools and converting more machines all the time." The chamber was constructed for Dal Jensen (2413) with drawings by Johnny Baca (9611).

Authors

J. T. Grisson and J. C. Newton (both 2412), "Anode Surface Radiance From Microsecond Vacuum Arcs," Vol. 45, No. 7, JOURNAL OF APPLIED PHYSICS.

W. J. Kass (5834), Comments on "A Mathematical Model Describing the Effects of Microviods Upon the Diffusion of Hydrogen in Iron and Steel," Vol 8, No. 7, SCRIPTA METALLURGICA.

L. P. Mix (5242) and F. C. Perry (5167), "Characterization of the Dose From a Pulsed Electron Beam Using Holographic Interferometry," Vol. 45, No. 7, JOURNAL OF APPLIED PHYSICS.

R. B. Pettit (5823), "Oxide Structure in Evaporated Aluminum Films," Vol. 45, No. 7, JOURNAL OF APPLIED PHYSICS.

J.E. Houston (5114), "Dynamic Background Subtraction and the Retrieval of Threshold Signals," Vol. 45, No. 7, THE REVIEW OF SCIENTIFIC INSTRUMENTS.

R.A. Lefever (2432), G.L. McVay and R.J. Baughman (both 5154), "Preparation of Hot-Pressed Silicon-Germanium Ingots: Part III - Vacuum Hot Pressing," Vol. 9, No. 7, MATERIALS RESEARCH BULLETIN.

P.M. Richards (5132), "NMR Relaxation at Low Temperature in One Dimensional Antiferromagnets: Comparison Between S= ½ and S=5/2," Vol. 15, No. 2, SOLID STATE COMMUNICATIONS.

J.M. Peek (5211), "Theory of Electron -$H+_2$ Dissociative Collisions," Vol. 10, No. 2, PHYSICAL REVIEW A.

H.T. Weaver (5154), "Determination of the Relative Effectiveness of Atomic Motion on Nuclear Dipole and Quadrupole Relaxation," Vol. 15, No. 1, JOURNAL OF MAGNETIC RESONANCE.

G.R. Hadley (5241), "Diffraction of Apodized Apertures," Vol. QE-10, No. 8, IEEE JOURNAL OF QUANTUM ELECTRONICS.

J.W. Poukey (5241) and A.J. Toepfer (5242), Coments on "Reverse Current Induced by Injection of a Relativistic Electron Beam Into A Pinched Plasma," Vol. 17, No. 2, THE PHYSICS OF FLUIDS.

I.J. Hall (1643) and C.V. Sampson, "One-Sided Tolerance Limits for a Normal Population Based on Censored Samples," Vol. 2, No. 4 (1973), JOURNAL OF STATISTICAL COMPUTATION AND SIMULATION.

F.G. Yost (2431), "The Stochastic Nature of Electronucleation," Vol. 23 (1974), JOURNAL OF CRYSTAL GROWTH.

L.C. Bartel (5151), et al, "Properties of the Hubbard Hamiltonian Including the Resonance-Broadening Terms for an Arbitrarily Filled Band," Vol. 10, No. 3, PHYSICAL REVIEW B.

J.G. Curro (5811), "Computer Simulation of Multiple Chain Systems - the Effect of Density on the Average Chain Dimensions," Vol. 61, No. 3, THE JOURNAL OF CHEMICAL PHYSICS.

For Technical Papers

ASNT, IEEE Honor Bernie Stiefeld

The American Society for Nondestructive Testing has chosen Bernard Stiefeld (9351) to receive the 1974 ASNT Achievement Award. His paper, "Computer-Based Display of Nondestructive Evaluation Data," was named the outstanding paper published in MATERIALS EVALUATION during 1973. The award will be made at the society's National Fall Conference banquet in Detroit on Oct. 23.

Bernie is the author of some 20 papers on infrared and thermal testing techniques, printed circuit testing, and computer techniques and has presented papers on these subjects at meetings of numerous technical societies. He has been at the Labs since February 1955 and is currently responsible for infrared testing and applications of computer techniques to the nondestructive test area. He served as chairman of the Albuquerque Section of ASNT in 1972-73 and is chairman of the IR/thermal paper review committee. He will be chairman of the IR/thermal session at the fall conference.

In addition to winning the ASNT Achievement Award, Bernie has been informed that another of his papers, co-authored with Doug Ballard, supervisor of Nondestructive Testing Division 9351 and former National President of ASNT, has been selected for a Merit Award from the Institute of Electrical and Electronic Engineers. This paper, "Computer-Based Thermographic Displays and Real-Time Techniques," was published in the 1973 IEEE Transactions on Industrial Electronics and Control Instrumentation.

JOHN JUSTUS, supervisor of Explosives, Rockets, Tubes, Optics and Electrical Supplies Division 3711, was informed last week that he had passed the New Mexico Bar exam. John had completed all but a year and a half of his course work at UNM Law School when he joined Sandia in January 1959. Three years ago he decided to finish the job, has attended classes part time since, and took the three-day bar exam last summer.

Sandians Active This Week in AVS Nat'l Symposium

Sandians are much involved in the 21st National Symposium of the American Vacuum Society being held this week in Anaheim, Calif. Leonard Beavis (2413) is chairman of the Program Committee; others on the committee include George Laramore (on LOA), Bob Blewer (2413) and Don Mattox (5834).

In the Vacuum Science and Technology Division, Dick Schwoebel (5820) will moderate the session on Depth Profiling Techniques and Blewer will chair the symposium on Ion-Material Interactions and Techniques I. - Interaction of Ion Beams with Solids. Bob Rye (5114) will moderate the Chemisorption I session of the Surface Science Division.

Sandians presenting invited papers include: R.S. Blewer, "Near Surface Light Atom Detection in Metals by a Proton Backscattering Technique"; R.K. Traeger (2431), "Evolution of the Chromium-Gold Thin Film Metallization"; E.P. EerNisse (5112), "Vacuum Applications of Quartz Resonators"; and R.K. Quinn (5154), "Electrochemistry at Thin Solid Films."

Contributed papers and their authors include: J.W. Guthrie (2413) and G.R. Fahrbach (2326), "Characteristics of Thin Film Ion Microprobe Depth Profiles"; D.R. Begeal (2413), "The Permeation and Diffusion of Hydrogen and Deuterium Through Rodar, Tin Coated Rodar, and Solder Coated Rodar"; J.A. Panitz (5114), "Field-Induced Desorption of Helium and Neon From Tungsten and Iridium"; K.L. Brower (5112), "Xa-Scattered Wave Calculations on $A1_2O_3$"; G.E. Laramore et al, "Structure of N1(100)-C(2 x 2)S Overlayers"; S.J. Niemczyk (5151), "An ScF-Xa-Sw Investigation of Chemisorption Bonding of Chalcogens of Nickel (001)."

W. Beezhold, K.L. Brower (both 5112) and R. Lear, "Ion Beam Analysis of Fe+ - and Cr+-Implanted $A1_2O_3$"; J.E. Houston (5114), "Valence-Band Structure in the Auger Spectrum of Aluminum"; R.G. Musket (8334), "Ion-Induced Electron Emission From Characterized Niobium Surfaces"; G.J. Thomas (8313) and W. Bauer (8334), "Carbide Formation on Nb Surfaces During High Temperature H Irradiation"; M.L. Knotek (5155), "Transport of Oxygen in Amorphous Ge Thin Films During Annealing"; R.A. Langley (5111) and D.J. Sharp (2432), "Ion Backscattering Study of Tantalum Nitride Thin Film Resistors"; D.M. Mattox and G.J. Kominiak (both 5834), "Deposition of Semiconductor Films with High Solar Adsorptance"; and R.R. Rye, "Equilibeation of H_2 and D_2 on Single Crystal Surfaces of Platinum."3

Death

Harold Howell of Test Engineering Division 1133 died Sept. 25 after a long illness. He was 53.

He had worked at the Labs for 26 years.

Survivors include his widow and two sons.

feedback

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. Today I went to the salvage yard to buy some pallets. Just inside the gate, inside a roped area were numerous pallets. I asked their price, only to told that they were already sold. How could they have been sold when the gate had just been opened?

A. The roped-in area along the south fence of our public sales yard is a "Hold Area" for the convenience of buyers who make a purchase during the Friday noon sales period, but are unable to remove the item at time of purchase. The material being held is identified by name of purchaser and Salvage Yard Sales Ticket number. Items are retained in the hold area for up to two weeks (or longer for valid reason) and can be picked up by the purchaser any time the Salvage Yard is open.

R. J. Hansen - 4800

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*Q. No one quarrels with the goal of reducing electrical consumption, but does seem that commonsense should be applied. I attended a 2½ hr. talk in 815 on July 18. It was **hot** when I entered; it got hotter as the afternoon wore on. It is impossible to concentrate in a hot, packed room, and people were dropping (to sleep) like flies!*

A. Air conditioning in Building 815 consists of a pair of Farr coolers, mounted on each end of the building, that utilize air and water to effect cooling. Excessively high outside temperature or higher humidity than that normally experienced in Albuquerque reduces the effectiveness of these units.

The coolers are automatically started each morning and were in operation on the day in question. Since both the temperature and the humidity were very high, and since the auditorium was "packed" there is no question that the room did get hot with the existing type of equipment. There are no corrective measures that can be taken to improve the room comfort under these atmospheric conditions. While refrigerated air conditioning would correct the problem, its cost is not justified on this type of building.

— R. E. Hopper - 9700

* * * * *

Q. As I surveyed about the tenth piece of throwaway paper to come across my desk today (a colloquium announcement in this case) I recalled that at the airport information on this level is broadcast on what is known as an "ATIS" tape, using what amounts to a continuous tape recording. The mind boggles to imagine the saving in paper which would obtain if, instead of sending every staff member an announcement of every event of interest, such information were to be put on a tape—like a weather tape—which could be reached by telephone.

A. Sandia has looked into the possibility of adopting an information broadcasting system; we have concluded that the disadvantages outweigh the advantages.

We do not now send "every staff member an announcement of every event of interest," and strict controls are already in effect to minimize the number and length of such notices being circulated. Colloquia notices, for example, are issued with approval by the Executive Vice President. Every effort is made to conserve paper by combining Management News Briefs items, instead of issuing individual items as received. Some notices of general interest to employees are disseminated by means of the Group Alerting Dispatch System (telephone service to department managers and above) and more information of non-emergency nature is being printed in the Lab News, to eliminate the need for special services. Thus, we are cognizant of the need to save paper, but so far indications at Sandia are that printed messages are the most effective and inexpensive means of communicating, particularly where selected groups are concerned.

— K. A. Smith - 3100

* * * * *

Q. Why is it that Sandia trains people in various programs such as OJT and Electronic Apprentice and then recruits people to fill ESA and Staff Assistant positions? It seems like a waste of money for Sandia to teach employees and then not to use this education.

A. Sandia established the apprenticeship and other similar programs to meet a foreseeable need for journeyman trades people. Had we not established an in-house program to train employees to meet specific future needs, it is doubtful that the local market could meet the need. These programs are designed to put heavy emphasis on developing craft skills that are directly applicable to Sandia's mission.

The TI equivalency program goes beyond the apprenticeship program in that it is intended to focus on the more creative aspects of technology. I feel that this is an absolute necessity for a top level ESA assignment. ESA jobs are audited periodically by the Compensation and Benefits Department to verify the technical depth of these assignments.

Graduates of OJT or apprenticeship programs are certainly encouraged to continue their education toward TI equivalency. Many of these employees have done so and have become ESA's as a result. In fact, 87 employees of those who have completed a TI equivalency program are classified SAT, ESA, or above.

All entry level SAT openings are announced as they occur, and employees are free to nominate themselves to fill these vacancies.

Sandia will continue to recruit qualified candidates from technical institutes for vacancies that are not filled through internal reclassifications.

R.J. Edelman - 4200

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Is there an adequate supply of FEEDBACK forms in your building? If not, give FEEDBACK administrator Phyl Wilson a call on ext. 4207. She'll see that the supply is replenished.

FUN & GAMES

Sandia Runners Ass'n. — Sunday the 20th is the 5th Annual Tour of Albuquerque Marathon, and if you want to see some very good runners (and some very tired ones) then show up at McKinley Jr. High School on 4500 Comanche NE at the starting time — 8 a.m. Some two-and-a-half hours or more later they'll be completing the race at the same place. The 26 mile course wanders up toward Tramway, north on Tramway to where it curves around to the Cornado Airport, thence back to McKinley. Looks like five or six SRA'ers will race.

Les Baumann (9500), track shoe tycoon, advises that he now, finally, has a good supply of Tiger Montreals, Cortez, Torino, and Marathon models. Les is at the gym daily after 5.

* * *

Ski Touring — Cross country skiers will hold their first meeting of the season Oct. 17, 7:30 p.m. in the hospitality room of Ed Black's Chevrolet, 333 San Mateo SE. The room is downstairs in the building on the used car lot. The NM Ski Touring Ass'n. is a good way to go if you think you might like to give touring a try; the group schedules outings for most weekends of the season.

* * *

Sandia Tennis Ass'n — Singles fall tournament is set for Oct. 19 and 20, while the doubles will come up Nov. 2-3. All Sandia and AEC people are eligible and you do not have to be on the tennis ladder to take part. Deadline for singles entries is Monday, Oct. 14. Send the entry to Tom Kerley, Org. 5167, or contact him by that date. Play begins at 7:30 a.m. on Oct. 19 at the Sierra Vista Tennis & Swim Club, and everyone plays at least two rounds. Bert Lindsay (2114), tournament director, advises that this will be a "drift" tournament, and when we wonderingly inquired as to what manner of beast such a contest was, Bert sent this explanation:

"The Drift system, which is a 'Bubble Sort' in sort terminology, can be described as a static ladder tournament where challenges are automatic and are limited to only one step on the ladder and are not replayed. By the elimination of the dynamic (or rechallenge) feature of the normal ladder, the tournament does terminate with an undefeated winner, a loser who has won no matches, and all others who have beaten at least the person directly below himself and has lost to the person directly above himself. Thus there is established a rank of order of all the players on teams in the tournaments."

You know, by now we should know better than to ask a mathematician for an explanation.

"YOU WON'T GET TRAMPLED" is the promise of Ski Swap chairman Bill Horton (AEC/ALO), because skiers and would-be skiers will have twice as much room this year in the new Agriculture Building at the State Fairgrounds. The 8th annual Ski Swap is sponsored by Sandia Peak Ski Patrol. Proceeds from event are used to purchase medical equipment for on-hill treatment of injured skiers. Swap registers items for sale Oct. 25 from noon to 8 p.m., runs sale on Oct. 26 (Saturday) from 9 to 5, and makes payoff to customers who have sold items on Oct. 27 from 2 to 5.

* * *

Sandia Bicycle Ass'n — Bike buffs who helped with or took part in the Bike-A-Thon held last year on KAFB will have an opportunity to do their thing again on Oct. 20 when the second annual Cancer Society Bike-A-Thon is held. The same general plan is being followed, with bike riders getting sponsors who agree to pay them so much per mile as they ride to raise money to fight cancer.

Jim Baremore (2132), president of the Bernalillo County Unit of ACS, says Sandians and Kirtland personnel were responsible for making the affair the most successful special event of the year for ACS in 1973, and he expects an even greater response this year. Main reason for the optimism, he says, is the imposing list of donated prizes available for contestants.

Grand prize in the Bike-A-Thon is a weekend for the winner and his or her family at Angel Fire, all expenses paid. Everyone who enters is eligible for the drawing. The rest of the prizes are related to performance as follows:

First prize: 10-speed bikes for the male and female turning in the most money.

Second prize: casette recorders for male and female turning in the second highest amounts of money.

Third prize: gift certificates of $12.50 at The Bike Shop for male and female raising third highest contributions.

Fourth prize: four bicycle pumps from Bicycle World.

Everyone who rides will get a coupon redeemable for a hamburger and a coke at American Sandwich Shop. In addition, free refreshments will be served for riders and other participants in arrangements.

The mile-long course is laid out near the Atomic Museum, south of the Credit Union on the Base. Riding gets underway at 9 a.m. and will continue until 2 p.m.

Participants may pick up entry forms at public schools, or at the Cancer Society office, 205 San Pedro NE. Forms are also available from LAB NEWS office, Bldg. 832. Riders of all ages are welcome.

* * *

Go Lobo — If you're a supporter of the UNM Lobos (or would like to be), check out the advantages of the newest Coronado Club group — the Wolfpack. Discounts on tickets, package tours to away games, inside info on the teams and coaches, and more — for only $5 a year (plus C-Club membership). George Horne at 296-1416 has all the details.

* * *

Music lovers — Albuquerque Symphony has sold out its eight-concert series, but tickets to the four-concert series are still available. The series includes these performances: Oct. 16, guest conductor Carlos Chavez from Mexico and pianist Philippe Entrement; Nov. 20, ASO conductor Yoshimi Takeda and guitarist Christopher Parkening; Jan. 10, soprano Eileen Farrell; and April 12, the ASO chorus. You can get ticket information from the ASO office, 265-3689.

* * *

Base Gym Schedule — Fall and winter schedule for the Base gym is as follows: Monday to Friday, 11 to 8; Saturdays, 9 to 5; Sundays and holidays, 1 to 5.

GENUINE, CERTIFIED, BIKEWAY, first of its kind in the city, is admired by Sharla Vandevender (4734) and Dave Barnes (9421). As head of the city-county Bikeway Committee, Sharla led the struggle (and that's what it was) to get bikeways in Albuquerque. She estimates the city will have some 60 miles of bikeways by July '75. Dave is president of the 400-member Sandia Bicycle Ass'n. and has been working (he thinks successfully) with Base authorities to get this bikeway extended through the Wyoming entrance and into the Base.

MILEPOSTS

LAB NEWS

October, 1974

Stan DeVault - 9542

15

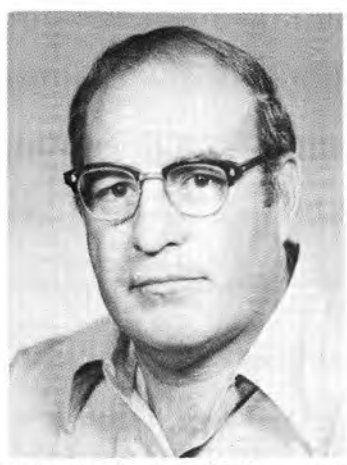
Henry Black - 2434 20

Lucille Brown - 9551 10

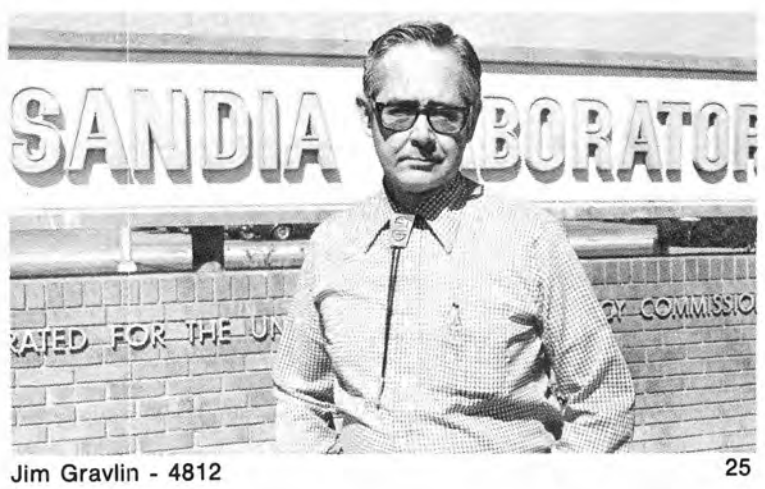
Jack Walker - 5220 10

Pauline Welkenback - 9717 10

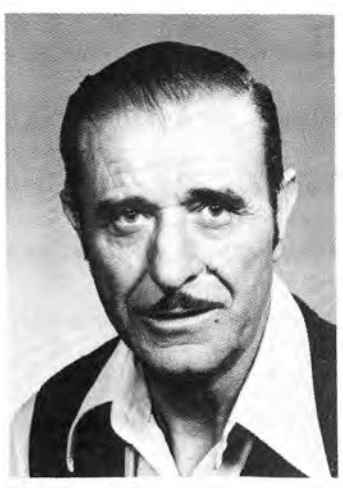
Frank Nielson - 9350 20



Antonio Garcia - 3645 25



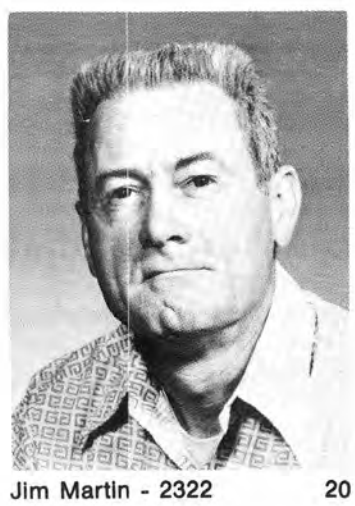
Jim Gravlin - 4812 25



Phil Sanchez - 3644 10

Bill Benedick - 5131 20

Hugh Sumlin - 2644 20



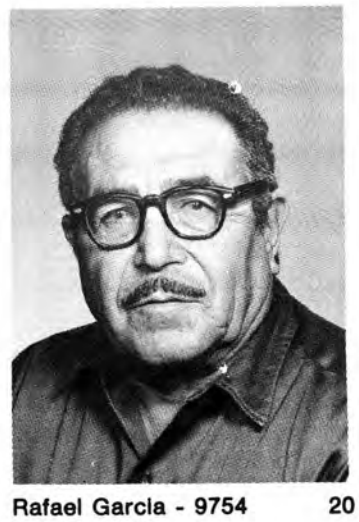
Jim Martin - 2322 20

Edward Gallegos - 4141 15

Robert Hostetler - 1244 20

Charlotte Freedman - 4150 15

Norman Zirvas - 3617 20



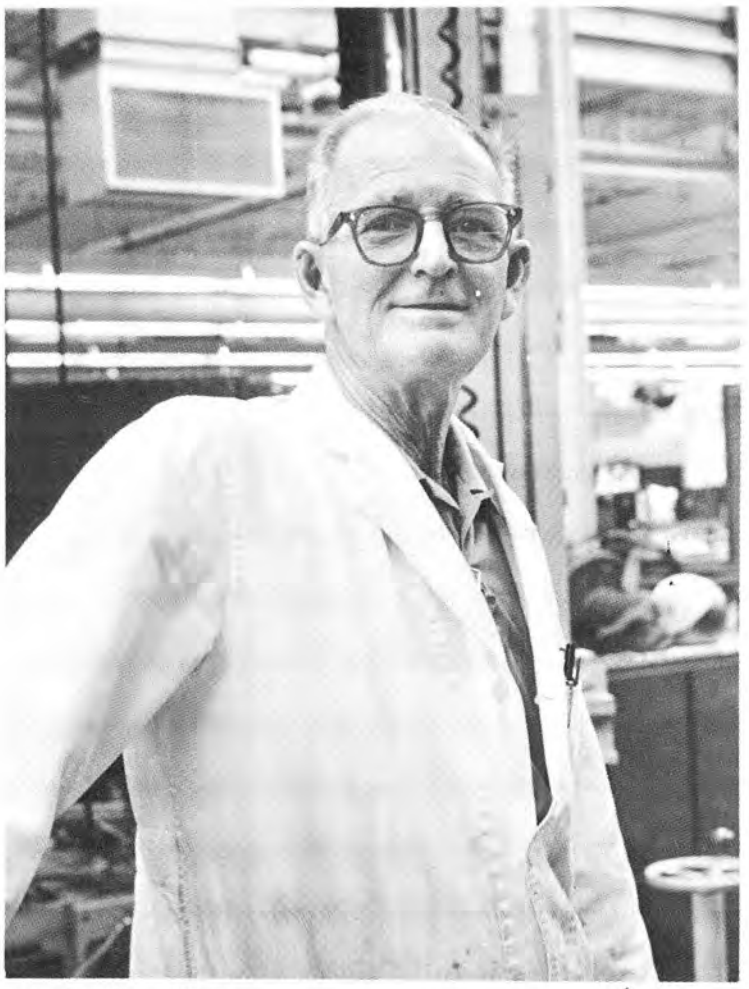
Rafael Garcia - 9754 20

Frances Bertolucci - 3141 10

Sanford Markowitz - 1252 15

Maxine Gatlin - 4256 20

Walton Errickson - 9611 10



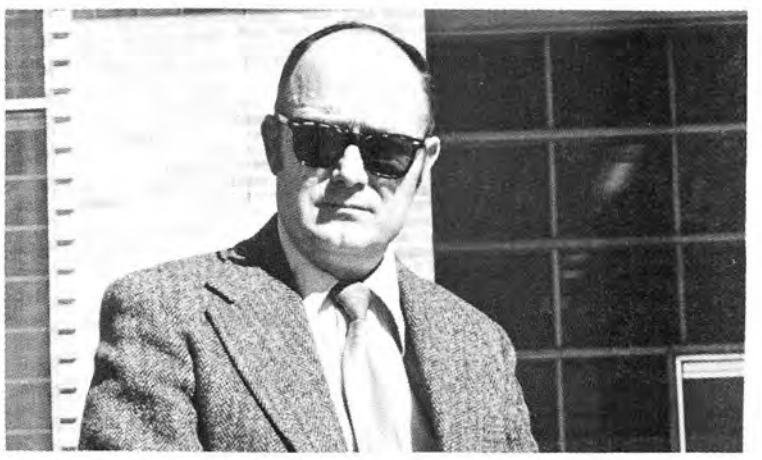
Albert Miller - 3644 20

Mary Walker - 2646 15

Robert Butler - 9321 20

Robert Treharn - 9713 10

Raymond Wilkinson - 9342 15



Walter Myers - 3725 20

George French - 9633 20

David Northrop - 5843 10

Harry Conrad - 9742 10

Vernon Kerr - 1134 20

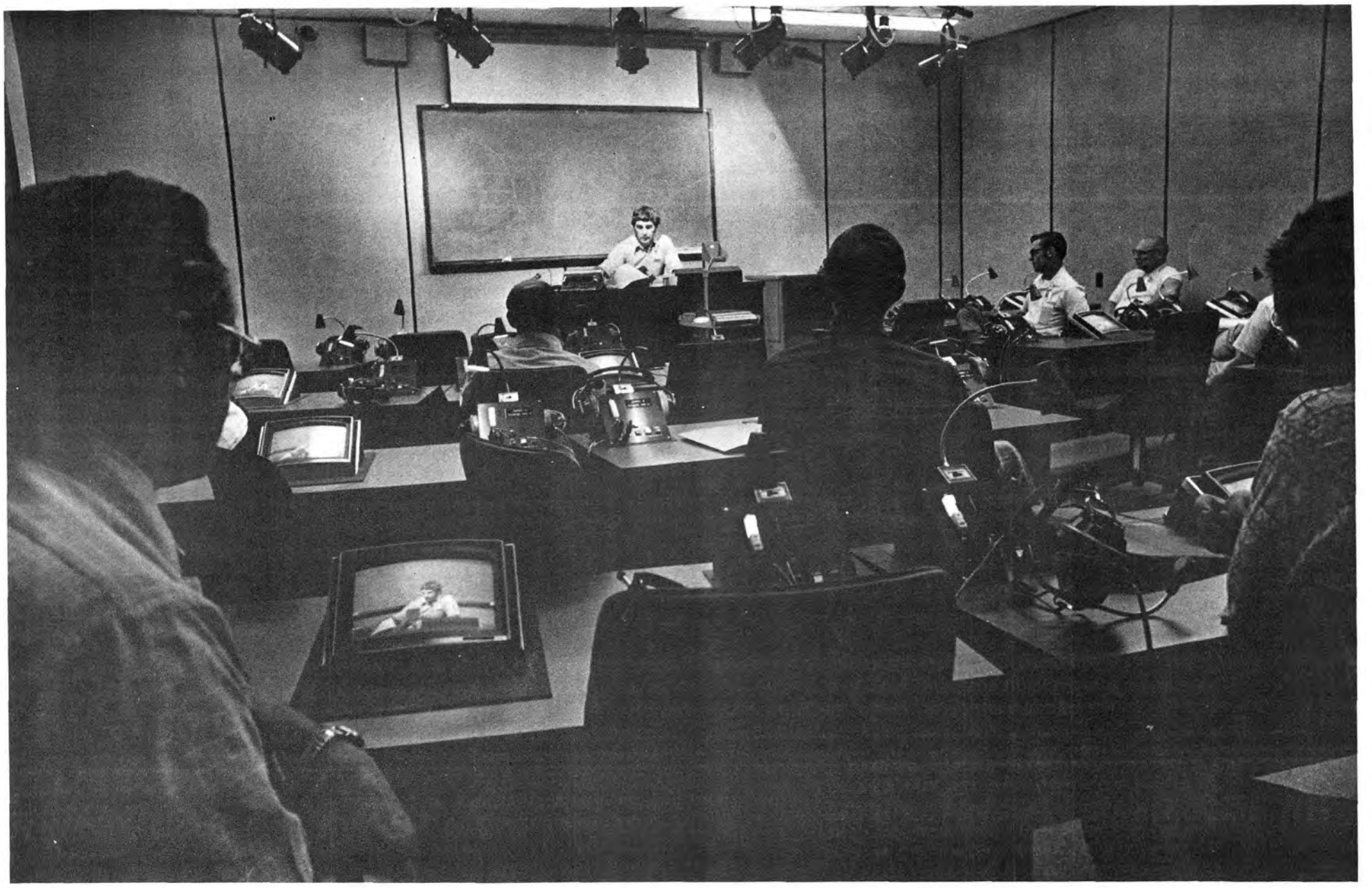
Jess Tidmore - 2413 10

George Peterson - 1247 20

Charles De Moss - 3621 15

Ella Lucerò - 4154 25

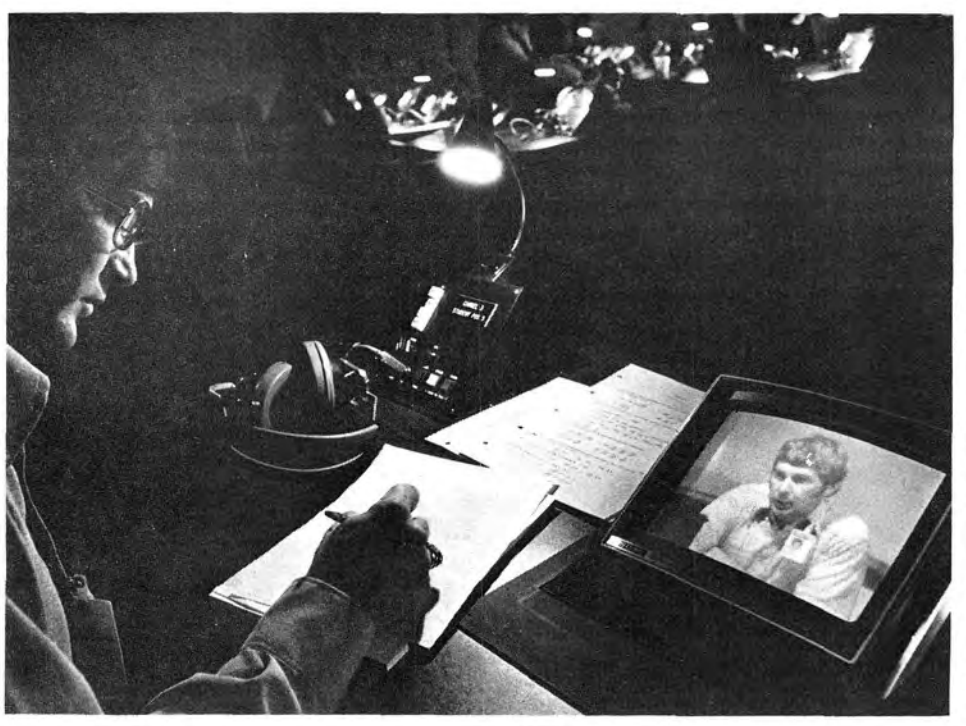
Eugene Hopkins - 3621 25

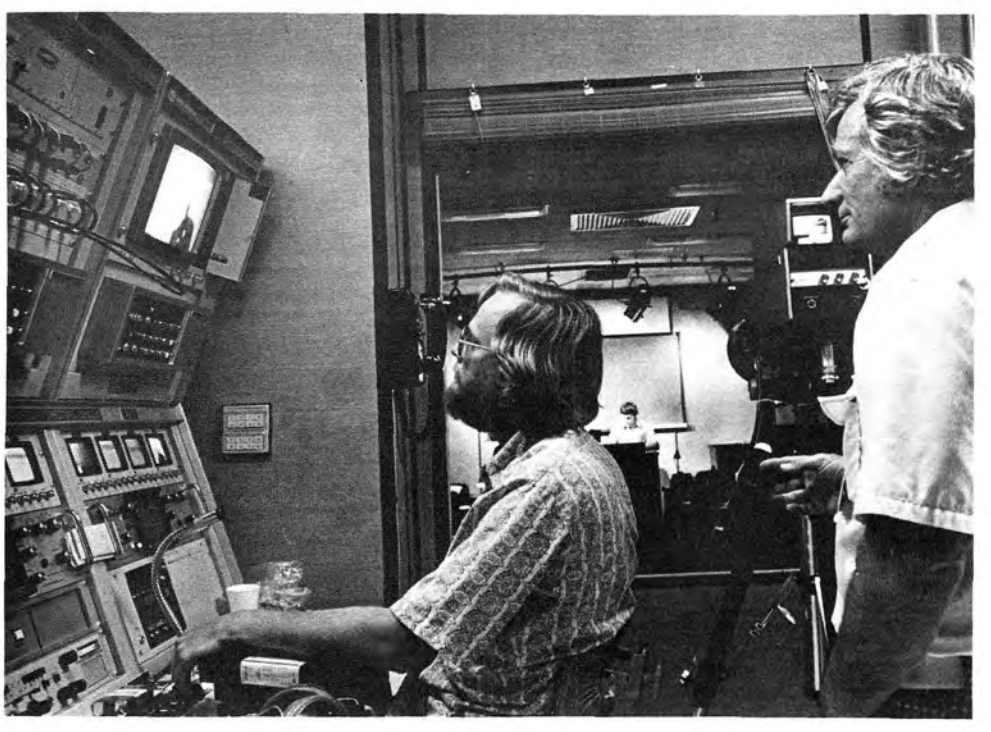


New Television Facilities

To Help Students Learn

Above: The new TV-equipped classroom in Bldg. 892; Bob Lassiter (3132) shows system's capabilities to instructors who will teach technical course being offered. Most will be video-taped. Right: Art McMullen, from Livermore's Division 8183, checks out director's console. Below right: Gary Jones (3132), seated, monitors taping; camera above instructor picks up visuals. Howard Shelton, supervisor of Education and Training Divison II 3132, observes. Below left: Each of a possible 32 students has individual carrer. Eight students can watch different make-up lessons at once — hence the headphones.





J. B. Gerardo (5210), "Survey of Electron-Beam-Initialed Gas Lasers," Second European Study Conference on Atomic and Molecular Physics in Ionized Gases, Sept. 3-5, Innsbruck, Austria.

R. B. Worrell (1653), "Using the Set Equation Transformation System in Fault Tree Analysis," Conference on Reliability and Fault Tree Analysis, Univ. of Calif. Operations Research Center, Sept. 3-7, Berkeley.

M. Scott and H.A. Watts (both 2642), "A Systematized Collection of Codes for Solving Two-Point Boundary-Value Problems," A.I.Ch.E. 80th National Meeting, Sept. 7-10, Boston.

D.H. Weingarten (2434), "A Design Guide Approach to Cable Procurement"; R.O. Work (2434), "SA1810 Glass Seal Cracking"; R.S. Nelson (2434), "A New Approach to Design of Shielded Cables"; R.M. Barnard (2434), "Effects of Interdiffusion on the Properties of Indium-Plate Contacts"; R.F. Casper (2434), "High Voltage Connector Design Criteria"; L.E. Horner (9513), "Sandia Cable Quality Program"; G.B. Varnado (9345), "Shielding Effectiveness of Bulk Shielded Cables"; J.C. Barnes (9354), "Instrumentation Techniques for Shielding Effectiveness Measurement," Connector and Cable Symposium, Sept. 11-12, BKC, Kansas City.

W. Beezhold (5112), "Effects of Ion Bombardment on Na and Cl Motion in SiO_2 Thin Films"; H.J. Stein (5112), "Radiation and Ion Studies of Heteroepitaxial Silicon on Dielectric Substrates," Gordon Research Conference on Metal-Insulator Semiconductor Systems, Aug. 26-30, Meriden, N.H.

P.M. Richards, "Consequences of Exchange in Low-Dimensional Compounds," NATO Advanced Study Institute on Low Dimensional Physics, Sept. 3-13, Starnberg, West Germany; and "Magnetic Resonance in Quasi One and Two Dimensional Compounds," IBM Zurich Research Lab and University of Leiden, Sept. 16 and 18, Zurich, Switzerland, and Leiden, The Netherlands.

B.M. Butcher (5167), "Melting and Porous Material Compaction During Shock Heating," Sept. 4-6, Naval Ships Research & Development Center, Annapolis, Md.

N.J. Magnani (5831), "Stress Corrosion Crack Propagation in High Strength Uranium Alloys," Oak Ridge Chapter of the American Society of Metals, Sept. 11, Oak Ridge, Tenn.

D.M. Bush (2523) and A.R. Baldwin (2522), "Sixty-Minute Thermal Battery; A Feasibility Study," 9th

Speakers

International Power Sources Symposium, Joint Services Electric Power Sources Committee, Sept. 17-19, Brighton, England.

E.P. EerNisee (5112), "Ion Implantation Damage in Insulators," IBM Thomas J. Watson Research Center, Sept. 18, Yorktown Heights, NY.

J.O. Harris, Jr., G.R. Laguna and J.T. Cutchen (all 2521), "Practical Applications of the Quadratic Electrooptic Effect in PLZT Ceramic Materials"; P.D. Wilcox (2521), "A Glass Bonded Si-Ge Ceramic Thermopile with Noble Metal Contacts," Fall Meeting, Electronics Division, ACS, Sept. 18-20, Denver, Colo.

G.C. Nelson (5825), "The Interaction of Noble Gas Ions with Solid Surfaces," "Improvement of the Ion Scattering Spectrometer Vacuum System," and "The Use of Surface Analytical Techniques for Diffusion Measurements," 1974 Ion Scattering Spectroscopy Users Conference, Sept. 22-25, Cable, Wis.

R.K. Clarke (1543), et al, "Characterization of Transportation Accident Environment"; R.K. Clarke, et al, "Quantitative Characterization of the Environment Experienced by Cargo in Aircraft Accidents"; J.T. Foley (1542), et al, "Quantitative Characterization of the Environment Experienced by Cargo in Motor Carrier Accidents"; D.W. Larson (1543), et al, "Quantitative Characterization of the Environment Experienced by Cargo in Railway Accidents"; W.F. Hartman (1542), et al, "The Analysis of Transportation Accident Environments — The Purpose, Methods, and Introduction," 4th International Symposium on the Packaging and Transportation of Radioactive Materials, Sept. 22-27, Miami Beach, Fla.

J.W. Reed (5644), "Simplified Blast Nuisance Predictions for Small Explosions"; J.A. Davis (9334), "A Pre-design Analysis Technique for Reinforced Concrete Structures," 16th DOD Explosives Safety Board Seminar, Sept. 24-26, Miami, Fla.

L.G. Rainhart (3622) and W.P. Schimmel, Jr. (1543), "Effect of Outdoor Aging on Acrylic Solar Panels"; T.D. Brumleve (8184), "A High Temperature Solar Energy System"; and J.D. Hankins (8441), "Cost Optimal Deployment of Mirrors Associated with a High Temperature Solar Energy System," International Solar Energy Society US Section Annual Meeting, Aug. 19-23, CSU, Fort Collins, Colo.

K.E. Sutton (4250), "The Handicapped: Attitudes in the Market Place," Governor's Committee on Employment of the Handicapped, Oct. 4, Farmington, N.M.

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CLASSIFIED ADVERTISING

Deadline: Friday noon, nine to weeks of publication unless changed by Monday. A maximum of 125 ads will be accepted for each issue.

RULES

1. Limit: 30 words.
2. One ad per week per person.
3. Must be submitted in writing.
4. Use recent employee numbers.
5. For Sandia Laboratories only: 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

REMINGTON Electric 25 office typewriter & stand, 13" carriage, carbon/cloth ribbon, pica type, $200. Johnstone, 296-3408.

MUNCIE 4-spd. w/clutch, pressure plate, flywheel & bell housing, new gears. Randolph, 268-1621.

BEDROOM SET, white, French provincial, 2 single dressers w/mirrors, 2 twin beds, night stand. Peabody, 296-6239.

BUNDY trumpet w/case, $150. Gammill, 299-4702.

SKIS, Spalding Sidereal, GS, 185cm, brand new with guarantee, $90. Vivian, 299-1785.

SKIS, Head Killy metal/glass, 193cm, $50. Beroldi, 268-7968 or 821-5732 after 5.

SOFA bed w/chair; 2 tires, mud, 9-15-15, $7 ea. Metoyer, 877-1893.

TWO double beds & dinette set w/circular table & 4 chairs. Crumley, 299-5372.

CHAIN saw, $60; 55 gal. barrels, $8 ea. Jaramillo, 842-0126.

FORD tire & wheel, 8 lugs, new, $50; 2 deep sea reels, 1/2 price; camp stove, lantern, $7.50 ea. Samuelson, 298-3637.

BACKPACK, new, lightweight, Camptown, $25. White, 255-9479

BACKPACK, never used, $12.50 White, 293-2219.

SOLID maple, TV-radio-record player console, $100; girl's bike, Schwinn, 26", $15; size 5 shoe roller skates, $3. Scranton, 299-4902.

BED, twin size, maple, bookcase headboard, w/mattress & springs, $40; radio hi-fi, console, mahogany cabinet, $40. Kohut, 298-0695.

CARRIER forced air natural gas furnace w/controls, 135,000 BTU's, $75 firm. Piper, 298-2053.

ENGLISH Springer Spaniel puppies, 3 males only, excellent conformation, hunting strain, liver on white, AKC. Whittet, 294-7136.

WOMAN'S golf clubs, Walter Hagen Professional, 3 woods, No. 1, 3, 5 w/covers, 7 irons, No. 3 thru 9, 1 dual wedge, 1 putter, cost $200, sell for $100. Klecotka, 821-1466.

33 SQ. YDS. of gold nylon carpeting, $25; 2 pair, yellow & white kitchen curtains; 2 rollaway beds, 39" width, $20, 30" width, $15. Schallert, 298-8942.

SKIS, 160cm Yamaha, Marker bindings, $20; Reiker boots, 7-1/2, $20. Gunckel, 299-3543.

HAMMOND organ w/bench to match. Fisher, 247-4816 after 5.

'73 KNIGHT camper trailer, sleeps 6, self-contained, new, never used, Jackson, 296-1307

HANKSCRAFT "Cool-Vapor" vaporizer, used once, $10. Burger, 299-8626.

YARD SALE: Oct. 12 (9 a.m. on), 13 (noon on), 11409 Summer NE. Bicycle, entertainment center & much miscellaneous. Werling, 293-7344.

BOAT, 18' deep "V", 155hp inboard/outboard on tandem 13" wheel trailer, less than 300 hrs. on timer log, $2695. Reynolds, 299-5157.

SKIS, 190cm Kneisel White Stars, 160cm Rebels; gun, 5mm Sheridan pellet rifle. Roth, 877-4997.

36" SIGNATURE gas range w/Teflon griddle & burner, $200. Newell, 299-3236.

16-1/2 FT. Aristocrat Land Commander travel trailer, sleeps 6, $1250. Benson, 268-3586.

GERBILS: will give away pet baby gerbils. Veneruso, 292-0372.

REMINGTON rifle, model 760, 270 cal., pump action, $100. Peckumn, 256-3363.

HENKE ski boots, size 7, used 3 times, $30. Vigil, 255-9076.

SUPER small AKC toy poodle, silver, female, 5 weeks old; AKC tiny fox terriers, male, female. Davis, 298-1957.

13' TRAILER, $695 or make offer. Lefever, 298-4091.

DRAPES, custom, lined, used 1 yr., length 64", width 118", abstract design, rod, $35. Muir, 296-2252.

SONY TC-600 stereo tape deck, portable case, walnut base; 20 Scotch & Sony tapes, $165. Owyoung, 294-1884.

ROCKS for landscaping, 1" diameter grey pebbles, make offer. Cowgill, 293-4386.

CAMERA, Canon, Demi-EE17 35mm, f/1.7 lens, shutter speed to 500th sec., automatic exposure, range finder w/case & strap, $75. Summers, 299-4710.

SWING set, disassembled, several yrs. old. Bingham, 298-6489.

BOOKS, light & heavy, short & long, dogs & winners, price cheap at our new stand in 880's snack bar, S. H'wy. 14 project.

AKC Beagle puppies, tri-color whelped 9-12-74. Drozdick, 298-9244.

ENGLISH Springer Spaniel puppies, liver & white color. Barth, 345-0172.

SHERIDAN pellet gun, 22 cal., new air chambers. Schwoebel, 298-4295.

SKIS, Skitque, 180cm, $40; Head, 190cm, $30; wide angle lens, 28mm f/2.8, $40; 35mm camera, Argus C-3, f 3/.5 filterpack, $25. Hardesty, 294-3430.

BACKPACK, Army type, $5; 5 pound down fill sleeping bag, Army Artic mummy type, $15, both for $18. Atkins, 298-5762.

SAND BUGGY parts, tubular frame, 2 wheels & tires, gas tank, 2 seats, steering wheel. Gabriel, 298-3353.

TRANSPORTATION

'72 FIAT, 850 Spider, orange w/black convertible top, low mileage, radio and heater, best offer around $2300. Jaycox, 256-9219 after 5 p.m.

'72 CHEV. Vega, GT coupe, 7000 miles on new engine, $1750. Baczek, 255-3429.

'71 SUZUKI, Motocross bike, 400 Cyclone, stored since Oct. '73, asking $450, make offer. Dougherty, 298-6043.

'68 VW Bug, needs paint, battery, nearly new tires, NADA book $1100, sell for $800 or reasonable offer. Duimstra, 299-6106.

'69 INTERNATIONAL TravelAll, 4-WD, PS, PB, AT, AC, new steel radials, positraction, radio, heater, $1775. Rea, 299-9315.

'71 CHEVY Impala Sport Coupe, 6-cyl., std. trans., PS, PB, low mileage, $1500. Reynolds, 296-8358.

'68 AUSTIN America, 25,000 miles, runs but needs work, $200 or best offer. Jones, 344-9393.

'59 FORD Galaxie, 2-dr., full power, hardtop, air, 65,000 miles, white & yellow. Baumann, 299-9493 after 6:30

'74 PACE Arrow motor home, completely self-contained, Onan generator, AM/FM & tape stereo system, $11,000 firm. Ashworth, 296-9126.

'61 COMET, 4-dr. sta. wgn., 6-cyl., Seaburn, 299-2215.

BIKE, girl's, 10-spd., $70; pool table, fully equipped, $110. Traver, 294-2138.

'71 DELTA 88, 2-dr. hardtop, gold/white top, AC, AT, PS, PB, regular gas, $1800. Duvall, 255-3326.

'54 FORD, 9 pass., V8, std., OD. Cafferty, 898-3102.

10-SPEED Puegot, PR-10, 23" Reynolds frame,sew-ups, 23 lbs., ridden 500 miles. Kidd, 299-0035.

'64 TRAVELALL, 4WD, 3-speed, radials, AM/FM radio, fold down rear seat, $995. Lassiter, 298-2461.

REAL ESTATE

1300 SQ. FT., NE Heights, 3-bdr., 1-3/4 baths, corner lot, $24,500, terms. Smith, 294-8701 after 5.

FOR RENT

SMALL tent trailer, first 2 weeks of November. Reynolds, 296-8358.

2-BDR. APT., carpets and drapes, close-in garage. Daniel, 268-8335.

WANTED

SKI EQUIPMENT in good condition: women's boots, 7m; 44-46" poles; 160-170 cm skis. Schwoebel, 298-4295.

GOOD home for puppies, 2 male, 2 female, 3/4 labrador, 1/4 shepherd. Snow, 345-3068.

WALL furnace for use w/natural gas, will consider any size over 20,000 BTU. Kroth, 293-9565.

WOMAN to share furnished Townhouse, washer/dryer, util. pd., patio, no smokers. Boyd, 265-4092.

CHILD'S 10-spd. bicycle, prefer boy's frame. Drumheller, 296-1023.

TWO small Advent loud speakers to match 2 I have. Stoker, 299-7220.

SKIERS-SKI Keystone, Copper Mountain, Breckenridge with the Coronado Ski Club, Feb. 8-12, $130, includes bus, lodging, skiing and breakfast. Sign up now. Westman, 255-6048.

LOST AND FOUND

LOST — Credit Union pocket holder w/2 pens & pencil; man's Rx sunglasses, black frame, thick dark lens, black case; silver loop earring, w/black design, rhinestone ear-piece; blue scarf, w/gold and white design; black gloves; silver fox earring (20 yr. award); algebra book; man's gold Elgin watch w/gold band; man's black rim safety glasses. — LOST & FOUND Bldg. 832, Tel. 264-3441.

FOUND — White key ring w/2 keys; man's tortoise shell bi-focal double nose piece, sunglasses; man's gray rim bi-focal, pearl and silver earring; gold pin w/green set — LOST & FOUND Bldg. 832, Tel. 264-3441.

• FREEBEE • C-CLUB • GLAD RAGS • BINDINGS • SNOW • CROSS COUNTRY •

FRIDAY	SATURDAY
11 — HAPPY HOUR MEDITERRANEAN BUFFET Adults $2.65 Under 12 1.65 Glad Rags on Stage *TOP HATS*	12 — TEEN DANCE *BLUE SNOW* 7:30 - 10:30 Members 25¢ Guests 50¢
18 — HAPPY HOUR OLD SOUTH BUFFET Adults $2.95 Under 12 1.95 The Couple on Stage *CROSS COUNTRY*	19 — OKTOBERFEST *MBC Trio* LOVELACE GERMAN BAND Members $5 Guests 6 Reservations Only

SUMMER's — a lousy time for an Oktoberfest. Now the time seems more appropriate. Fast for the fest (on the 19th) so you'll have room for Kultsalat, sauerbraten mit Kartoffel puffer, Eisben mit sauerkraut und all das goot schtuffen. Der MBC Trio mit Mike Michnovicz vill happy musich maken. *Reservations by the 12th.*

ALMOST — time for skiers (especially first-timers) to get ready for the slopes. The C-Club Ski Club has a whole pre-ski package coming up. First is a regular meeting at 7 on the 15th when Mr. Ski himself, Stein Erickson, will inspire and regale. Then on the 19th at 1 is the third annual dryland ski school headed by personable Tom Long, director of the Sandia Peak Ski School. With Bob Neel, he'll show novices how to survive Acute Awkwardness — that feeling you get the first time those strange boots and long boards are strapped to your feet. Info on lesson packages too. On the 21st at 7 is a "Here's What you'll Need to Start Skiing" presentation — skis, bindings, and boots. It's followed by the ever-popular "Here's Where To Get Them Cheap." Finally on the 22nd at 7 is another regular meeting, again stressing equipment. Bring any stuff you want to sell or swap.

GONE — is the Oriental buffet. But don't

READY when the snow is. Bob Lassiter (3132) is the new president of Sitzmarker Ski (and other activities) Club, now celebrating its 10th birthday. Yvonne Sandoval (3723) reminds Coronado Ski Clubbers that October is full of pre-ski activities; check the text for details. Both clubs welcome new members.

despair. Tonight it's Mediterranean — Italian sausage, cheese ravioli, spaghetti with clams. And next Friday it's Old South — catfish, barbecued ribs, hughpuppies, everything but magnolia. Incidentally, The Couple is great listening, a sort of Peter-Paul-Mary, Simon-Garfunkel, Ian-Sylvia quality.

THERE'S — Blue Snow coming down for the Teen Dance tomorrow. But the only Bunyan will be on an occasional overworked sole. Tickets via parents, please.

A — reminder: Mr. Freebee is wandering Friday night Happy Hours these days seeking winners of various bottled goodies. To win, you must be a C-Club member — and you must be there at 7. If you're not, your prize goes into the pot and the next winner takes all. And don't forget the new H-Hour format: music to talk by till 8, then music for dancing.

NIP — on Harvey Wallbangers on the 26th. And wear a HW tee-shirt home. Harvey (plus Tess and Her All-Girl Band) at Soul Session.

IN — case you've forgotten, deadline for the Caribbean trip is the 29th, for the Mexico City trip Nov. 8. A few vacancies are left on Mazatlan trip. Call the office.

THE — Annual Halloween Party approacheth. Not oddly, it's the 31st. Better your kids are terrified at the Club than terrified dodging cars while Trick-or-Treating. More info next issue.

AIR — transportation to Phoenix is only part of a special commercial package featuring the Arizona State-Lobo game Oct. 26. $98 gets you all travel, game ticket, 2 nights in Scottsdale, and more. Further info from Shirley Dean at 296-3264 *soon.*

Events Calendar

Oct. 12 — Football, UNM vs San Jose State, 7:30 p.m., UNM Stadium.
Oct. 12 — NM Mt. Club, La Luz Trail, 17 miles, Gulf Mart, 7:30 a.m.
Oct. 12 — Alb. Youth Symphony, 8:15 p.m., Popejoy Hall, UNM.
Oct. 13 — UNM Faculty Recital, Artemus Edwards-Basoon, 4:00 p.m., Keller Hall, UNM.
Oct. 13 — Travel Adventure Film, "Brazil," 7:30 p.m., Popejoy Hall, UNM.
Oct. 13 — University of Albuquerque, Humanities Lecture, Dr. Muriel Latham-Pfiefer, New Mexico Arts, 7:30 p.m.
Oct. 15-16 — Alb. Symphony Orchestra, pianist Philippe Entremont & conductor Carlos Chavez, 8:15 p.m., Popejoy Hall, UNM.
Oct. 17-19 — Bosque Art Assn. Art Exhibit, Wyoming Mall.
Oct. 19 — Moving Pictures Ltd., "L'Atalante & Zero De Conduite," 10 a.m. & noon at Guild Theater, 268-6879.
Oct. 20 — NM Mt. Club, Tree Springs hike, 8 miles, Western Skies, 8:30 a.m.
Oct. 20 — Community Concert Series - Israeli pianist Ophra Yerushalmi, 8:15 p.m., Popejoy Hall, UNM.
Oct. 20 — Music Vesper Series: The Prague String Quartet, 1st United Methodist Church, 4:00 p.m., 243-5646.
Oct. 21 — UNM Music Dept., French organist Andre Marchal, 8:00 p.m., Keller Hall, UNM.
Oct. 23 — Audubon Film Series, Fran William Hall's "Small World," 7:30 p.m., Popejoy Hall, UNM.
Oct. 24 — Old Town Studio, "Who's Afraid of Virginia Woolf?", Thurs., Fri., Sat. thru Nov. 2 at 8:00 p.m.
Oct. 25-27 — Ski Swap of Sandia Peak Ski Patrol, Agri. Bldg., State Fairgrounds.