Sandia to Help With Aurora Experiments

Will Fire Research Rockets

This spring a team of Sandia Laboratories scientists and engineers will collaborate with a group of university scientists to fire a pair of instrumented research rockets into the arctic aurora. The experiment is designed to learn whether particles in the aurora originate in the sun or the earth.

The energetic particles from the aurora are collected in metal foils that are swept through the aurora as part of a rocket payload. The foils are returned to the laboratory and the particle content analyzed. In addition, optical photometers and electrostatic particle analyzers will be an important part of the payload to determine auroral constituents.

The experiment is tentatively scheduled to begin March 15 at Poker Flats, 30 miles northeast of Fairbanks, Alaska.

The metal foil experiment was originally proposed by Dr. W. Ian Axford and Dr. Hugh J.A. Chivers of the University of California at San Diego, and Dr. Johannes Geiss of the University of Bern, Switzerland. Sandia was asked to collaborate in the experiment, to design and field the payload, and to handle launch and recovery operations because of the Labs' experience with the Mylar high altitude sampler. Ron Ewing (5235) is a project scientist; Ken Cordes (9224), vehicle project engineer; Ren Moore (9221), test director; Win Watson (9221), coordinator for all systems; and Jim Davis (9224), diagnostic rocket.

The experiment is an extension of the "solar wind" experiments designed by Dr. Geiss and performed by the astronauts during manned lunar landings. In the solar wind experiment, sheets of thin aluminum foil are deployed by the astronauts at the beginning of their extra-vehicular activity, then collected immediately before their departure. In the laboratory, the embedded atoms from the solar wind are "baked out" of the aluminum in an oven and then identified with a mass spectrometer.

In the Sandia experiment, a Nike-Tomahawk (Nitehawk) rocket will carry a nine-foot payload to an altitude of 200 miles. At an altitude of 100 miles, the nosecone will be explosively separated and three pie-shaped Mylar plastic sheets covered with metal foils will unwind from a shaft to form a disc eight feet in diameter. The foils will be exposed to the aurora for five minutes, then the Mylar panels will be reeled back into a storage compartment, sealed for protection during reentry, and a parachute (equipped with a radio beacon) will be deployed for return of the payload to earth.

The metal foils will be returned to the University of Bern for laboratory analysis. A measurement of the ratio of helium-4 to helium-3 is expected to identify the origin of atoms in the aurora. In connection with the primary sampler experiment, each Nitehawk payload will include: a 16mm camera to monitor deployment of the sampler panels and a particle counter to detect the concentration of hydrogen encountered.

Several additional experiments designed by Sandia scientists will be included to provide background information for the solar wind experiment and also allow further investigation into the physics of the aurora. An optical filter wheel photometer will be used to scan a number of selected wavelengths in the optical spectrum emitted by the auroral display. The purpose is to determine the density of several of the excited states of atmospheric constituents as a function of altitude. The instrument was developed by Department 5230 specifically for auroral investigations. Adjacent to the photometer, particle measurements will be made by a "retarding potential analyzer." This instrument investigates electron energies and densities. Such information can be combined with the photometer data to gain new insights into important physical processes which take place in the aurora. Bob Woods (5235) and Gary Tisone (5233) are principal experimenters, and Trevor Looney (9226) is the instrument engineer on these investigations.
Salesman: I've got to hand it to you, sir, you're a hard bargainer. Only $4995 for this Whammy 8 and getting a six percent loan out of you well you're something else!

You: (moderately) I know a thing or two about money matters.

Mrs.: I can't wait to show Verla Lou our new Whammy 8!!!

Someday, but then you got home and in an idle moment happen to read the contract, and somewhere buried in the text come across a note about money matters...

Some other devices:

The discount: In this case the interest charge of $6 per $50, adding the interest charge right away to the principal, 12 percent and that is then repaid in 12 monthly installments. Does this sound like 12 percent or more may not be unreasonable, all things considered. But you, the consumer, have a right to know what the credit costs are.

Since July 1969, when the Truth-in-Lending Law came into effect, there has been a lot of talk about interest rates. Many of these fees are merely disguised interest charges. And remember, when the salesman starts talking turkey, insist on knowing the true annual interest rate and ask for a copy of the contract.

The two most important parts of the law stipulate that the dollar finance charge and the annual rate of interest be stated in the contract. These numbers tell you at a glance how much you are paying for credit and its relative cost in percentage terms. Of these, the annual percentage rate stands out as the more reliable yardstick for comparing lending charges.

Livemore Report

Plans to modernize the Livemore Credit Union facility were recently reviewed, and I am happy to report that two rooms and a lobby area in Bldg. 911 have been made available. The plans include decorations and furnishings similar to those in Albuquerque and a tentative opening date of June 1. To mark the occasion, your Board of Directors will be discussing an open house and removable walls and the like. Board members will attend and will be available for discussion of the operation of the Credit Union. Complete details will be announced at a later date.

Credit Union Statement

As part of its normal audit procedure, the Supervisory Committee recently mailed statements to members with account numbers from 900 to 999. If your account number is in this series and you have not received your statement, please notify Karl Wieland (4117), committee chairman.

New Mexico Academy of Science Honors

Meyer, Auerbach

Two Sandians have been elected to Fellow membership in the New Mexico Academy of Science and will be honored tonight at the Pequot Hall during the final session of the Symposium on Pequot History and Science.

The two men are Richard Meyer (5224) and Irving Auerbach (9238). Their honor is in recognition of significant contributions to the Academy or to science in New Mexico.

Dick has served as chairman of the Academy's Research Committee and as editor of the Journal of the New Mexico Academy of Science.

Irv has participated in the Academy's visiting scientist program for many years and was president of the Academy in 1963. He also was program director of the National Science Seminars, held in conjunction with the National Science Fair in Albuquerque.

During his 14 years at Sandia, Irv has worked on several high energy radiation experiments, was assigned to the Classification Division, and is presently concerned with reactor research and development of reactor materials. He is also a Fellow of the American Chemical Society.

Today's symposium is sponsored by the Sandia National Laboratory, Albuquerque, New Mexico.

Minicomputer Symposium

Planned for Feb. 18

Product Data Systems Development organization will sponsor a Minicomputer Symposium Thursday, Feb. 18, featuring a dozen presentations by Sandians on usage and application.

The day-long program in Bldg. 612 auditorium will begin with opening addresses by Bob Henderson, Vice President, 1980. The other talks will deal with such topics as: general guidelines and problem-solving for data applications, digital filtering, and specific applications, including data gathering and processing, data display, and process monitoring and control.
Vista New Mexico

(Ed. Note—In this new LAB NEWS column there will appear articles about the people and history of the Southwest, chiefly prepared by authorities on the subject. Aim of this feature is to enhance the understanding and appreciation of New Mexicans for our distinctive culture.)

Fred Norwood, a mathematician in org. 1721, together with other members of UNM’s Chicano Studies Center, prepared the following article when we inquired about the Center. When not a Sandia mathematician, Fred teaches at the Center.)

UNM’s Chicano Studies Center

Did you know that it is easier to find out what life was like in a small English village in medieval times than it is to get the same information about a village in New Mexico around the year 1800? Because, in the former instance, graduate students and scholars by the score have swarmed over every item of evidence—artifacts, the literature of the period, letters, etc.—that could provide a basis for their documentation of what life was like then. But comparatively little has been done by scholars in what is a rich field—the history and culture of peoples of the Southwest. This is one of the reasons for the formation, 18 months ago, of the Chicano Studies Center at the University of New Mexico.

In addition social developments of the past few years have made apparent the need for more knowledge and understanding of the ethnic and cultural differences which exist in our midst. Lack of understanding has led to serious misconceptions by ourselves about each other—a circumstance that has sometimes hindered the proper functioning of our society.

Ethnic studies programs in our universities can help eliminate this problem and, in the past four years, we have seen the establishment of ethnic studies in many of the nation’s universities, including the University of New Mexico. Course offerings in Chicano, Indian, and Black studies have been available at UNM for the last 18 months.

The Chicano Studies program at UNM embraces more activities than is normally found in a university division. Over and above strictly academic pursuits, Chicano Studies deals with other aspects of student life and the community. To this end, the program sponsors a Student Services office, a Chicano Library, and a Community Relations group.

Development by the Chicano Studies staff of necessary class material has been difficult. Few very good source books have been written. For example, the book on barrio sociology deals only with a barrio located in Venezuela. For history, several good books have been published, but for other topics the most valuable sources of information are newspapers, magazines, and reports that have appeared since 1965.

In addition to University lectures, the Center sponsors conferences, workshops, and consulting services to public school systems to assist in the development of curricula that will include the Chicano contributions to society and a more balanced and realistic presentation of Mexican and Southwestern history.

In the area of student services, Chicano Studies offers college recruitment services, scholarship information, counseling and tutoring. The recruitment and scholarship information is directed to students who meet the entrance requirements but are not aware of the financial help provided by the University. The counseling service is provided as a supplement to that given by the University. Students are assisted in interpreting aptitude test scores, in learning about the University, and in many other areas.

The Chicano Studies librarian compiles contemporary Chicano works and periodicals, as well as historical documents which will help the student understand more fully the social makeup of New Mexico and the Southwest.

The Center’s community relations program aims to provide a bridge between the University and the Chicano community. Among its activities are sponsorship of performances of the Teatro Campesino (a California theatre company), setting up workshops and seminars for high school pupils, and inviting community representatives to speak in Chicano Studies classes.

The Chicano Studies Center thus does not restrict its activities to matters that are only academic, but also deals actively with the community and with students and their problems.

The Huff ‘N Puff Brigade

Anyone who would voluntarily run 26 miles is either a nut or a competitor in a marathon race. Four Sandians will be going the distance Feb. 27 when they compete in the AAU-sanctioned College of Artesia Marathon. The event has been held for the past four years and has attracted as many as 350 contestants.

Bob Lowrey (9231) will be competing for the fifth time in the Artesia Marathon. His best time so far is four hours and six minutes. “I’m one year older each time,” he says, “and I beat my previous record a little. This makes me feel pretty good.”

Irv Hall (1643), who will be trying the marathon for the second time this year, says that a guy runs it for the same reason that someone climbs a mountain. “No logic,” Irv says, “no good reasons. It’s there and it’s a challenge. Can I make it? Somehow I have to prove that I can.”

Bob Lowrey (AEC) is going to make the run for the first time this year. His reasons are similar to those of Irv. “I want to find out if I can,” he says.

Bob Gregory (2653) says it in a different way. He says, “I’m crazy.”

Crazy or not, the foursome can be found any noon hour during the week jogging around Sandia Base with a determined look on their faces. All of them average about 10 miles a week of practice running.

Anyone can compete in the Artesia Marathon. A doctor’s certificate is required. And anyone who finished in less than seven hours is awarded a Marathon T-shirt.

The race will start at 9 a.m. at a point five miles west of Hope, N.M. Finish line is in downtown Artesia, 26 long hard miles away. Good luck.
People Collect Rubber Stamps

Rubber-stamping documents has long been associated with an approval or endorsement of a matter without exercising judgment. Such is not the case at Sandia. The stamps serve their purpose to convey important information. And they are bought for cost- or time-saving reasons.

Who uses them

Scurry nearly every hall has them to put security markings on classified correspondence. A secret document takes a minute or two to copy and one marking does not count the frequently used "Rough Draft," the date stamp nor the "Original Signed By".

In addition to stamps for classifying, there are stamps for routing, stamps for checking and stamps for instructing, to name a few. Ordering special-design rubber stamps for Sandia Laboratories, Livermore is one of Jim Martin's jobs in Material Control Section 37.

"Most general purpose stamps," says Jim, "are available in the Stores catalog. But we find that the use of hand-stamping stamps and hand-stamping a stamp a year. Some are replacements for worn-out stamps—most are new. We can always expect new stamp orders when there is a reorganization or a significant change in procedure.

Today's rubber stamps (95 percent filler, 5 percent carbon) are commonly stained in the writers drawers because they're aesthetically unattractive. That wasn't a factor in their evolution. The Chinese used hand-carved wood blocks and clay stamps for printing religious symbols as early as the 7th Century A.D. Both Oriental and Occidental cultures used stamps where large numbers of exact copies of religious symbols or signatures were required to assure things like scriptural authenticity. Artists used them 300 years ago to make book plates. The French used them (and the Mexicans still do) for decorative pottery designs. But it wasn't until Charles Goodyear discovered vulcanizing in 1839 that rubber stamps were produced in large quantities.

Having a stamp isn't assurance you'll get it. Orders for stamps crossing Jim's desk are reviewed by Company personnel to ensure that the requester has a reasonable business need. Checks are also made to determine how many rubber stamps affects an administrative procedure. Is the procedure the best? Does it need changing? Is a printed form doing its job? Should it be redesigned?

According sounds like a lot of over an item that costs 75 cents to $5? Not when the stamp permits the saving of $1000 in forms or steps that amount in money.

"We find rubber stamps very useful in our work," says Ken Skinrood, supervisor of the Order Analysis and Traffic Section 8264-1. "It's important that the people doing a job based on our workpaper know all the special requirements of that job. The rules for shipping one kind of material, for instance, differ from another, yet we use the same procedure of stamps for all shipments. Stamping "HEL" or "SS" or "Radiowave" across the face of a piece of paper is an attention-getter. It tells the man packaging the material and the truck driver moving it that something's different about this shipment. Handle it accordingly.

Stamps also help Ken's section keep track of Purchase Orders—experience has shown records need to be kept.

"Why buy special-printed log books for this purpose?" reasons Ken. "We just use commercially available bags and stamp the column headings to suit our purpose. Entries such as "Good Quality," "Need Packing," or "actual cost" save many hours in expensive data entry, which doesn't figure for budget purposes. Then, too, purchasing forms are always changing and sometimes a $3 stamp will allow us to use all existing stock. This period of time also gives Ken and his section an adequate time to redesign and order replacement stock."

In addition, rubber stamps, he calls are in rubber stamps, recalls Jim. "He wanted the letters for his kitchen tile. He changed his mind, though, when we couldn't find a stamp big enough for the stamps."
UCF AWARDS were presented to 41 Sandia organizations last week by President Hornbeck. Brian Finley (3112), left, accepts award for the 3100 organization.

1970 Reserve Fund Allocation Made

President Hornbeck distributed 41 UCF awards to Sandia organizations last week with the comment that "you did a wonderful job." To qualify for the awards an organization had to have 90 percent of its employees participating in the Employees Contribution Plan at the equivalent of 75 percent of the fair share level. (A fair share is one hour's pay per month.)

President Hornbeck, president of the Albuquerque UCF during last year's campaign, said the organization represented that Sandia employees' contributions helped mightily in reaching the UCF goal last year.

"I want to thank all Sandia contributors," he said, "as well as all Sandia campaign workers.'"

Organization 3100 led the list of awards as the only directorate with 100 percent participation. Three departments—3110, 3120 and 4380—qualified for awards with 100 percent participation at the fair share level. Organizations with 100 percent participation were 100, 1650, 1740, 2440, 2450, 3000 staff, 3130, 3230, 3350, 3510, 4120, 4140, 7620 and 9150.

Department 3110 received the UCF award for the seventh consecutive year. Departments 2440, 2450, 3130, 4110 and 4120 received awards for the sixth year.

For the fifth year in a row Department 1510 qualified for the UCF award. Fourth year winners were 1500, 1520, 1580, 1590, 1640, 1660, 1740, 2440, 3400, 3430, 3510, 3580 and 3590.

Second year awards were presented to 100, 2300, 2320, 2360, 3100, 3230, 4140, 7620, 9150 and 9520.

Receiving awards for the first time this year were 1210, 1530, 1710, 2310, 3000 staff, 3120, 3900 staff, 5130, 5330, 7280 and 7610.

Events Calendar

Feb. 14—Windsor Trail by snowshoes or cross country skis. N.M. Mountain Club, leader Bob Babb, tel. 255-8560.
Feb. 15—Indian dances, San Juan Casino, 8-10 p.m.
Feb. 16—Windsor Trail by snowshoes or cross country skis. Town Studio, tel. 242-4602.
Feb. 16—Western Electric special.
Feb. 17—Arizona, 8-10 p.m.
Feb. 18—Western Electric special.
Feb. 19—Show and Tell at the Sandia Reserve and Design Department.
Feb. 20—"The Man Who Never Slept," Bugatti, 804 Edsall Ave., NE.
Feb. 21—Indochina, 804 Edsall Ave., NE.
Feb. 22—Event at Sandia Reserve and Design Department.
Feb. 23—"The Horse's Mouth," Civic Center, 8-10 p.m.
Feb. 24—"The Plow That Broke the Plains," La Marti, 8-10 p.m.
Feb. 25—"The Man Who Never Slept," Bugatti, 804 Edsall Ave., NE.
Feb. 26—Event at Sandia Reserve and Design Department.
Feb. 27—"The Horse's Mouth," Civic Center, 8-10 p.m.

Supervisory Appointments

DAVID NORTHROP to supervisor, Composites Materials Development Division 1, 5313, effective Feb. 1.

Since joining Sandia in September 1964, David has worked in Materials Research Division 5154, where he has been primarily concerned with investigation of vaporization phenomena.

David graduated from the University of Chicago with BS, MS and PhD degrees in chemistry. He is a member of the American Association for the Advancement of Science.

David and his wife Audrey have two children and reside at 7207 Harwood Ave., NE.

* * *

PAUL STOKES to supervisor, Systems Analysis Division 7111, effective Feb. 1.

Joining Sandia in July 1960, Paul was assigned to a reliability division and later worked with a command control group. One of his assignments in this area was to help develop protective hardware for Sandia's Unmanned Seismic Observatory. Later he joined a study group related to arms control and most recently has been in a systems design group.

Paul received his BS degree in electrical engineering from North Dakota State University, and, under Sandia's Technical Development Program, earned an MS from the University of New Mexico. He is a member of the Institute of Electrical and Electronics Engineers.

Paul and his wife Laura live in Alameda. They have three daughters—a four-year-old and 20-month-old twins.

Fibers Strengthen Brittle Material
In New Technique

Sometimes the novelty of a technique can be the basis of a patent. Such was the case with a disclosure submitted by Ed Beauchamp (5332) and James Morenz, now a graduate student at the University of Utah.

Their concern was with lead telluride, a thermoelectric material commonly used in the space isotope program. Although the material had the desired electrical properties, it lacked strength.

The men knew that ductile material could be strengthened by adding brittle fibers, but they had no real evidence that this would be true when the matrix was also brittle, but the technique worked. The two men mixed small diameter fibers of sapphire with a powdered version of lead telluride, then hot pressed the combination. The result was a material with a tensile failure strength of at least 6000 pounds per square inch, about 10 times the strength of the material without the addition of the fibers.

The inventors believe the recently patented technique would also be applicable to the fabrication of other ceramics.

Take Note

The Sandia Golf Association (Women) annual membership drive will start Tuesday, with a general meeting of members and interested golfers at 12:30 p.m., in conference room 229 of Bldg. 802.

Tournaments, league play, the handicap system, and the club's goals will be discussed. Sandia and AEC women are eligible for membership at $2 per year.

The association customarily arranges for group lessons for both beginners and intermediate golfers at reduced rates.

* * *

Gene Farnum (5154) will present "X-Ray Studies of Dislocations in Single Crystals" at the 5100 Staff Seminar Feb. 16. Wendall Beechold (5112) will discuss "The Crystalline-to-Amorphous Transformation in Ion-Implanted Si" on Feb. 23.

The seminar meets on Tuesday mornings at 8:30 in rm. 201 of Bldg. 806.

* * *

Volunteers who can spend a few hours a week working in the office are needed by the Bernalillo County Unit of the American Cancer Society. Name lists and solicitation kits are now being prepared for the April Crusade and help is needed during the day, evenings, or on weekends, according to Ted Sherwin (3430), President of the unit. Retired employees are especially welcome, but anyone who can spare a few hours will be helping a worthy cause. Call 268-2809 to sign up for a specific time.

JOE LAVAL (3432) will exhibit a group of photoprints (made by silk screen from photographic negatives) at the Annual Cowboy Artists of America Show at the University of New Mexico Feb. 14 through Mar. 12. This will be the second time that Joe has had a showing there of his unique art.

AFTERNOON IN NEW MEXICO by James Boren was chosen the best watercolor in the recent annual Cowboy Artists of America show. It is one of 21 paintings and bronzes depicting Western art on exhibit in the Bldg. 802 foyer until Feb. 22.
Dorothy Lamour, of course, was a beautiful princess in a harem. Bob Hope and Bing Crosby were Bob Hope and Bing Crosby in that order. The film was “Road to Morocco” and it’s worth seeing again because you can take the kids.

Combine the movie with a stage show featuring the Fiesta Singers and the Albuquerque Music Club singing tribute to American composers and you have quite an evening. Add one more touch: two chapters of the old Bela Lugosi movie serial “The Phantom Creeps” and you have something outasight. Because, in the first place, admission is free to members and families and, secondly, happy hour bar prices will be in effect all evening. Steak sandwiches and hamburgers will be available.

The event starts at 7 p.m. tomorrow night at the Coronado Club. For lack of a better name, it’s called “Family Vaudeville and Classic Comedy Night with the Creeping Phantom and Happy Hour Prices.”

**Soul Session** on Saturday, Feb. 27, will feature a new band—Freddie Williams and the Screaming Yellow Zonkers. Other than that, it’s the same old successful Soul Session formula: free admission to members, happy hour prices from 8:30 to 12:30, and strobe lights to stop the action occasionally.

**Teenagers** can go-go, frug, bugaloo, or whatever on Saturday, Feb. 20, when a group called simply “Cross” is wired into the bandstand. Member parents should pick up tickets (25 cents for their own youngsters, 50 cents for guests) before the bash. It starts at 7:30, ends at 10:30 p.m.