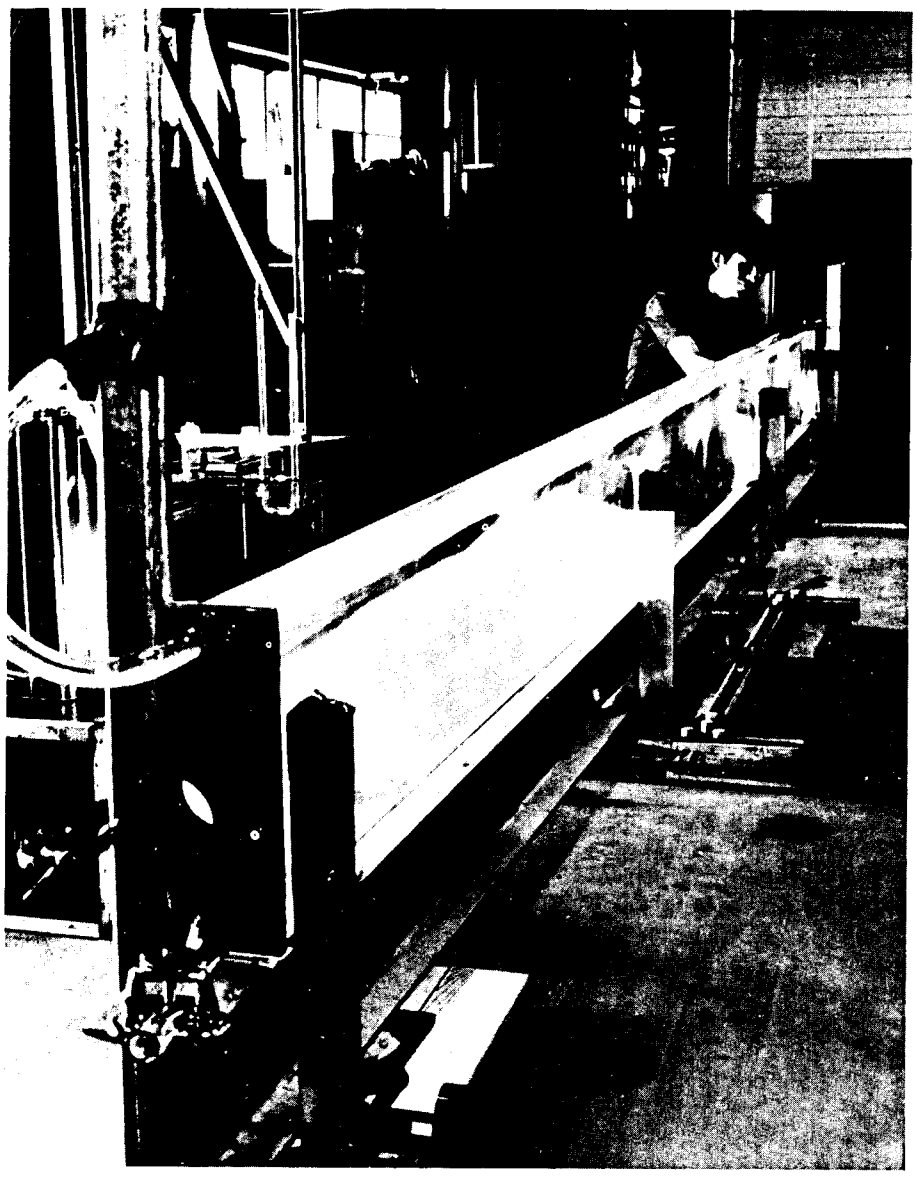
BROOKHAVEN BULLETIN
Vol. 35 - No. 4 January 30, 1981
BROOKHAVEN NATIONAL LABORATORY



Mort Rosen

Physicist Yoichiro Suzuki inspects a full-size acrylic scintillator cell, one of 2,000 in the neutrino detector.

Hot On The Trail of Neutrinos

Everybody claims to be number one, the biggest or the best. But here at Brookhaven Lab, it's true.

The biggest high energy physics experiment at the AGS is under way. It's the biggest in size, complexity, people and money. Nine BNL scientists are involved: Leif Ahrens, Samuel Aronson, Philip Connolly, Bruce Gibbard, Michael Murtagh, Stephen Murtagh, Alan Thorndike, Peter Wanderer, and Hywel White. Joining forces with them are other physicists from Brown University, University of Pennsylvania, SUNY at Stony Brook, KEK, Osaka University and INS-Tokyo.

The last three institutions in the list are located in Japan. In 1979, the United States and Japan signed a high energy physics research agreement to study the fundamental nature of matter and energy. The experiment at Brookhaven, then, is jointly funded by DOE and Japan. Five Japanese physicists are now here. Said BNL scientist Sam Aronson, "As a group, they probably make up the largest contingent of physicists devoting full time to this experiment. Their contribution is enormous."

The Experiment

The goal of the experiment, in physics jargon, is to study elastic scattering of neutrinos from electrons and protons. Elastic scattering of particles is like the scattering of billiard balls: when the particles interact, they bounce off each other without changing their character or forming new particles.

Said Aronson, "These are fundamental reactions that need to be precisely measured. We want to determine the rate at which elastic scattering occurs relative to all interactions."

The experimental apparatus could be used to study other reactions as well, for example, neutrino oscillations.

The conventional notion about neutrinos is that they have no mass and no charge. "But neutrino mass is a topic of intense debate among physicists," said Aronson. "Recent experiments hint that certain neutrinos do have mass."

"When you look at the mathematical description of oscillations," he continued, "you come to the conclusion that neutrinos can't oscillate unless they do have mass. By looking for such oscillations in our detector, we might be able to confirm that neutrinos have mass. It would rank in importance with the discovery of different neutrino types at BNL 20 years ago."

The Detector

Neutrinos interact weakly with other particles. They could pass right through the earth and never hit anything. By rough estimate, they would have to go through one million earths for 50 percent of them to interact.

(Continued on page 2)

On Credit Unions

Over the years, a number of individuals and groups, such as Women in Science, IBEW, and BNL Council, have indicated an interest in the possibility of BNL employees participating in a credit union. The unusually high current interest rates being charged by most banks for consumer loans and other factors have led to this subject being raised again.

As a first step, BNL management has invited a representative of the Teachers Federal Credit Union to speak to employees on this matter. A question and answer period will follow the presentations.

A short time after the information meetings have been held, a survey will be conducted to measure the extent of employee interest in credit unions.

Scheduled Information Meetings

Date	Time	Place
Feb. 4	7:30 a.m.	Rm. B, Berkner Hall
Feb. 4	12:30 p.m.	Rm. B, Berkner Hall
Feb. 4	1:15 p.m.	Rm. B, Berkner Hall
Feb. 4	5:00 p.m.	Rm. B, Berkner Hall

No Parking

Those little yellow pieces of paper that appear on some onsite cars are not to celebrate the return of the hostages. They are parking tickets.

Cars are so ticketed by Lab police when found in undesignated areas. The SPI states that "parking is permitted only in designated parking areas in accordance with any posted limitations."

If a street is undesignated, for example, Brookhaven Avenue, it means there is no parking.

COEXISTING WITH COMPUTERS IN THE OFFICE

By Jagdish Dalal

The term "office of the future" covers a broad variety of disciplines and crosses many functional and technical boundaries. At times, the term, and the connotation it gives, blurs the boundaries of various technologies to such an extent that the use of the phrase paints an Orwellian picture of a dehumanized world. In order to understand what an office of the future will be like, I will talk about technologies and their uses in a generic form. The integration of these technologies and their applications then will become tools in the hands of the managers.

Until now, the use of computers and related technologies has been limited to automating routine operational tasks. The primary use, from the management point of view, has been to free increasingly costly people at all levels of organization from dull, repetitive tasks so that they can be better utilized. Thus, the systems have been justified based on "number of jobs saved." The office of the future will look at these technologies differently.

There are two things that go on in an office: processing and communication of information. So far, we have used technologies to assist us in the processing aspects of our offices. In the offices of the future, we will be more concerned about using technology to communicate information. This trend can be illustrated by the example of current computer technologies providing graphic output of data on a terminal, as opposed to printed output. This new emphasis on the use of technology to facilitate greater communication will have a deeper impact on the offices of the future than it now appears. The structure of offices today depends on higher productivity through specialization which helps shorten lines of communication. With the convergence of various office technologies, that concern will be limited, if not eliminated all together.

For example, stock exchanges depend largely on specialized people performing specialized tasks in a predetermined fashion using commonly established ground rules to sell or purchase securities.

A futuristic stock exchange operation was unveiled recently at a small Cincinnati stock exchange. It utilizes a system developed by CDC Corporation with a commitment from Merrill, Lynch & Co., to automate stock trading. At that exchange, almost all aspects of stock trading have been automated. Placing of the order, matching the order with available orders, execution of the trade, and notification of the trade is done using computer and telecommunication techniques.

Let us look briefly at some of these technologies to understand their impact on offices of the future.

Obviously, computers, whether they are big centralized systems or

(Continued on page 2)

Teleconferencing is here! At DOE's Forrestal (Washington, D.C.) and Germantown (Maryland) headquarters buildings, the Energy Visual Conferencing Service has already been used by some 5000 persons for communicating between the sites. The service offered by DOE's Office of Computer Services and Telecommunications Management uses two identical conference rooms some 30 miles apart. Each has two 23-inch monitors and room for 16 people. The speaker's image is automatically placed on the screen by a voice-activated camera. —DOE Photo

Introducing Andrea Brand, M.D.

During the last six months, some emloyees have become acquainted with a petite young woman at the Industrial Medicine Clinic. She is Andrea L. Brand, M.D., who has joined Dr. Sbarra in the medical care and counseling of BNL employees.

A Long Islander, Dr. Brand received her bachelor's degree from Adelphia University and the M.D. degree from Downstate Medical Center. She interned at Sinai Hospital, Baltimore, and did her residency in family practice at Southside Hospital in Bay Shore. Dr. Brand is board certified as a family practioner.

Before she joined the Medical Department staff, Dr. Brand was in private practice for three years. She notes that a family practioner is a modern version of what used to be called a general practioner. She finds her training in family practice is of great help to her here because she sees "bits and pieces of many different facets of medicine," with the emphasis on internal medicine and orthopedics. Working at BNL is similar to private practice, she says, except that patients who require followup have to be referred to outside physicians.

Doug Humphrey

Andrea Brand

Dr. Brand is married and lives in East Hampton.

Computers (Cont'd)

distributed mini and micro systems, will form the nucleus for technologies in offices of the future. In these offices, which will not include a desk or file cabinet, computers will become an accepted tool similar to a typewriter or calculator.

The increased capability and ease of use of telecommunication technology will revolutionize offices as computers did. Use of satellite communications, laser beams, and fiber optics, along with packet switching techniques, will make telecommunication as accessible as the phone.

Word Processing is a fast growing industry that is already helping revolutionize offices. These microprocessor based devices speed up the processing of written texts. When coupled with telecommunication capabilities, they will form a network for such advance applications as electronic mail, electronic blackboards, teleconferencing, and facsimile transmission. These and other electronic communication technologies will reduce the volume of paper currently inundating our offices.

Teleconferencing is a technique that will become very popular in our energy-poor future. Through teleconferencing, geographically dispersed conference participants will utilize computer terminals, data banks, word processors, facsimile transmission, and telecommunication to discuss the subject of common interest. This will eliminate scheduling meetings and transporting participants from all over the country to a common point. Recognizing the potential of this technology, Holiday Inn is currently sponsoring certain exploratory workshops in teleconferencing services.

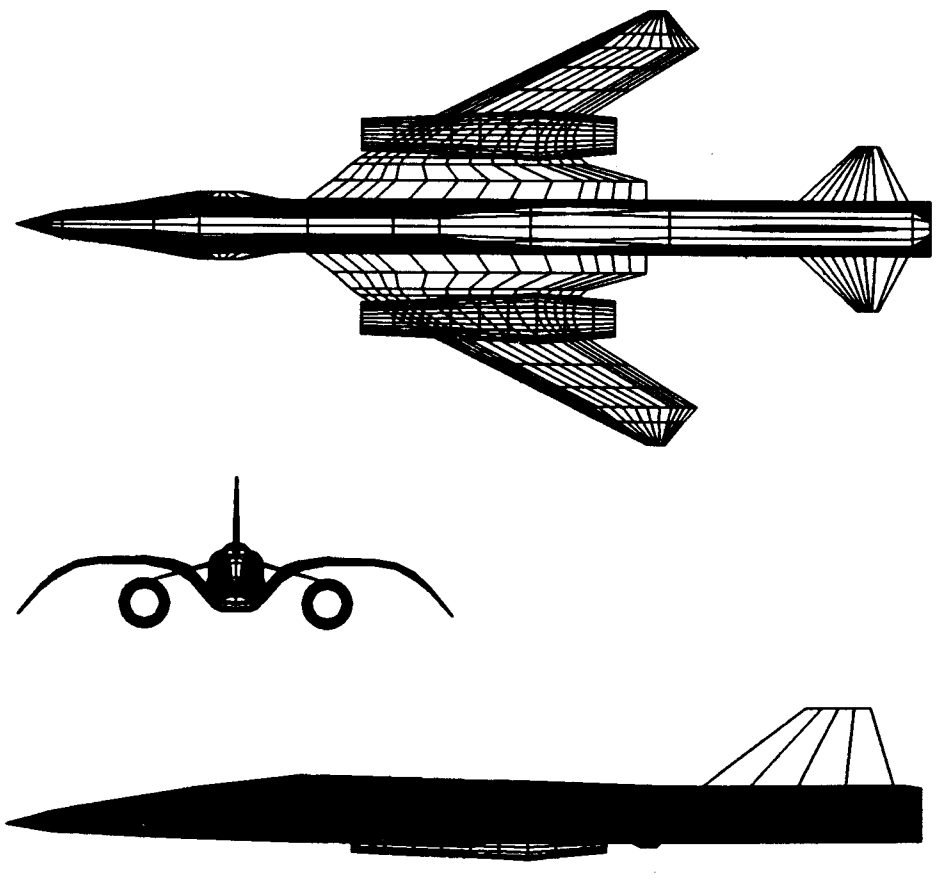
The use of "robots" in an office will add another dimension to companies of the future. Use of computer controlled, preprogrammed robots to deliver mail is now gaining popularity. More and more use of these robots will be made to eliminate highly mechanical, labor-intensive operations in businesses.

The most important impact of these technologies will be on the organizational structures of companies. Traditional service groups like Data Processing and Word Processing will be fused together. Lines and networks of communication between organizations will not be paper driven, but will be transmitted by electronic signals. This alone will increase productivity and help reduce confusion.

In the future, office managers will be concerned only with managing — planning, organizing, controlling and developing — rather than with operating mechanics. In a world connected by computers and telecommunication, work patterns and work habits will be different.

With the development of "artificially intelligent" computers, every manager may have a computer assistant that understands its master's job and the company. Such a computer will bring its own revolution.

In order to take advantage of these and other technologies yet to be developed, corporations and officers of the future will have to be attuned to their impact and plan for change, rather than be swept up by changes made for them by these technologies.



These three views of a "parasol wing aircraft" were drawn by a computer and designed by a contractor using the computer graphics facilities of Applied Math. The aircraft is seen first from above, then head on, and, finally, from the side. The different views are used to analyze new structures.

Neutrinos (Cont'd)

The new experimental detector built to "see" neutrino interactions is large. It takes up space approximately equivalent to a couple of two-story houses complete with basements. But it's by no means earth size.

How will it work? Aronson said it is a matter of numbers — large numbers. The AGS can deliver so many protons that the number of neutrinos generated is very large, large enough to provide thousands of neutrino interactions a day in the detector.

The heart of the detector is mineral oil with a little scintillator mixed in -170 tons of the mixture, held in acrylic cells. The scintillator is made up of special molecules that are raised to an excited state by the passage of charged particles and emit light when they relax. As neutrinos enter the detector and bounce off electrons and protons, the interactions will trigger the scintillator. The light will be recorded by photomultipliers positioned at two ends of each scintillator cell. In between layers of scintillator cells are proportional drift tubes that will record particle tracks.

As Aronson explained it, the scintillator cells take a snapshot of an event in time and also give an energy profile, since the total amount of light is proportional to the energy of the event. Drift tubes take a snapshot of the event in space. All this information will be collected by 20,000 data channels and then massaged by computers, which merge the information and reconstruct the event.

Off and Running

This experiment represents a big investment in people and money. But it's all happened in record time. Hywel White, BNL scientist, gave some background on how it all came about.

Several years ago, preliminary studies were done by BNL and University of Pennsylvania physicists. "Results were promising, so we looked around for more people and more money," recalled White. About two years ago, the collaboration was formalized.

"Since then, with the help of engineers and technicians," said White, "we have moved very quickly." Complete prototypes of all parts of the detector were built, and a production-line factory is now in full swing. All components are being assembled on site, including 2,000 acrylic scintillator cells, 4,000 photomultipliers and 14,000 proportional drift tubes.

This month, an engineering run was made with just part of the detector in place. Everyone agrees it was a "howling success."

In April, about two-thirds of the final detector will be ready to do real physics. A two-week experimental run is scheduled then, with a longer one to start in May. The plan is to complete the detector this summer and run ten weeks each fiscal year. The detector will have several years of data-collecting life. Analysis will take longer.

As Hywel White said, "When all of this works, there is a moment of pure joy." Spring is just around the corner, and all systems are go.

Mort Rosen

Louis P. Caiola John A. Penney

Karl E. Peterson

Retirees

Louis P. Caiola retired January 23 from his position as project engineer with Plant Engineering. He came to the Lab in 1947.

John A. Penney, a project engineer in the Reactor Division, retired on January 26 with over 30 years of Laboratory service. Penney and his wife left on Wednesday for their retirement home in Athens, Tennessee, where they are "really looking forward" to being near two of their children and other family members.

Karl E. Peterson retires today after being with the Lab since 1968. A machine tool rebuilder, group leader, with the Central Shops, Peterson plans to "stay in Port Jefferson and do a little fishing."

Medical Symposium

An AUI/BNL Medical Department Symposium on "Genotoxic Effects of Airborne Agents" will be held February 9-11 at Berkner Hall. The program includes sessions on assay and exposure technology, airborne agents and risk assessment.

Members of the Laboratory are invited to attend. For information, call the program chairman, Ray Tice, Ext. 3624.

In Memoriam

Henry C. Shute, a Messenger at Staff Services, died on January 24 at the age of 56. He had been employed at the Laboratory since February 28, 1977. Shute, who lived in North Babylon, is survived by his wife, Edna, and two daughters, Ellen and Joan.

BROOKHAVEN BULLETIN

Published weekly
for the employees of
BROOKHAVEN NATIONAL LABORATORY

BERNICE PETERSEN, Editor
MONA S. ROWE, Assistant Editor

35 BROOKHAVEN AVE., UPTON, N.Y. 11973
Telephone (516)345-2345

CARL R. THIEN, Public Relations Officer

In Appreciation

My family would like to thank everyone who was so kind to Jim during his illness and after his death.

To those who called and sent flowers and cards, God bless you. I didn't realize Jim had so many friends at the Lab.

—Marie Connell and the
George Martin Family

Camera Club

The Camera Club will meet on February 3 at 7:00 p.m. in the Recreation Hall lounge to elect officers, plan activities, and view slides brought by members and guests.

Cafeteria Menu

Week Ending Feb. 6, 1981

Monday, February 2

French onion soup	(cup)	.55
	(bowl)	.65
Corned beef & cabbage		1.60
Baked lasagna & 1 veg.		1.50
Hot Deli - Knickerbocker sandwich		1.65

Tuesday, February 3

Cream of broccoli soup	(cup)	.55
	(bowl)	.65
Roast top round of beef w/1 veg.		1.65
Ravioli & 1 veg.		1.50
Hot Deli - Pastrami	(on bread)	1.65
	(on roll)	1.75

Wednesday, February 4

Chicken vegetable soup	(cup)	.55
	(bowl)	.65
Turkey divan & 1 veg.		1.60
Swedish meatballs w/noodles		1.60
Hot Deli - Barbequed fresh ham	(on bread)	1.65
	(on roll)	1.75

Thursday, February 5

Navy bean soup	(cup)	.55
	(bowl)	.65
Southern fried chicken w/1 veg.		1.60
Beef hash & 1 veg.		1.55
Hot Deli - Philadelphia style steak hero		1.80

Friday, February 6

Seafood chowder	(cup)	.60
	(bowl)	.70
Yankee pot roast & 1 veg.		1.65
Broiled filet of fish & 1 veg.		1.55
Hot Deli - Roasted turkey breast	(on bread)	1.65
	(on roll)	1.75

Volleyball

Final Standings - Second Quarter

A Division	
High Society	13-2
No Names	12-3
Mixed Ups	9-6
Las Bolas	7-8
Nuts and Bolts	4-11
Kings Court	0-15
B Division	
Leftovers	15-0
Semi Tough	9-6
Lemufs	8-7
TNT	7-8
Oh Nos	4-11
Puff & Stuff	2-13

High Society over No Names, 7-15, 15-13, 15-0. Mixed Ups over Kings Court, 15-7, 15-5, 15-5. Las Bolas over Nuts & Bolts, 15-8, 9-15, 15-11.

Leftovers over Puff & Stuff, 15-1, 15-7, 15-4. Semi Tough over Oh Nos, 15-2, 15-4, 15-5. TNT over Lemufs, 14-16, 15-13, 15-9.

French Club

February 2 is Groundhog Day in this country, but in France it is "La Chandeleur," a religious holiday named after the candles carried in religious processions. Almost everywhere in France the holiday is traditionally marked by the preparation and eating of crepes. Superstition has it that one's good fortune for the rest of the year is assured by cooking the crepe while holding a gold coin in one hand. The alternative is to make a wish, which will come true if the crepe returns to the pan after it has been tossed into the air.

Le Cercle Francais de BNL will celebrate *La Chandeleur* a few days late on Friday, February 6, at 8 p.m. in the Recreation Hall. A copious supply of crepes, with appropriate fillings, will be provided. Anyone who wishes to insure his or her prosperity will be welcome in the kitchen (but bring your own gold coin). Apple cider, coffee and tea will be served.

Because of space limitations, there is a limit on the number of people who can be accommodated. Anyone interested should telephone one of the following as soon as possible: Gaby Jacobus (751-2544), Julia Walenta (928-4926), or Ralph Weston (Ext. 4373). Non-members of The French Group will be asked for a donation of $4.

Hospitality News

Peter Spier of Shoreham, New York, will be at our monthly coffee get-together on Tuesday, February 3. He will discuss the "Illustration and Publication of Books."

Join us on Tuesday, at 9:30 in the Brookhaven Center. Coffee, tea and danish will be served. Please come and bring the children. Babysitting will be provided free of charge. We suggest you bring along a toy or two for your child to play with.

In the event of snow, the meeting will be cancelled.

Stony Brook Events

Pianist: Jeffery Wood, January 30, 8 p.m., Recital Hall, Fine Arts Center. Works of Bach, Wood, Kodaly, Chopin.

Ground Hog Cantata, featuring Stony Brook Chamber Singers and Music Prof. Peter Winkler, piano. February 2, 8 p.m., Recital Hall, Fine Arts Center. Students, sr. citizens, $1; others, $2. Information: 246-5678.

Stony Brook Jazz Club: February 3, 8 p.m., Recital Hall, Fine Arts Center. Students, sr. citizens, $1; others, $2. Information: 246-5678.

Music At Berkner

Pianist Stephanie Brown will present the third concert in the 1980-81 BERA Concert Series on Tuesday, February 10 at 8:30 p.m. in Berkner Hall.

Twenty-five years old, Miss Brown has received critical acclaim rare for one so young. Two years ago, Joseph Horowitz of the *New York Times* wrote, "...Miss Brown is a wonderful pianist indeed, with a sound of her own and a distinctive personality to match. Her tone is limpid, and exquisitely shaded and controlled..." Speight Jenkins of the *New York Post* said she "seems to have the spark of individuality that separates the exceptional from the good, solid professional."

Miss Brown has appeared as a soloist with the Brandenburg Ensemble; the St. Louis, Seattle and Detroit Symphony Orchestras; and the New York Philharmonic. She has also taken part in three "Music from Marlboro" tours throughout the country. She made her solo recording debut in 1978 on the Musical Heritage Label, and her performance of the Brahms Piano Quartets, with Alexander Schneider, Walter Trampler and Leslie Parnas, has been released on Vanguard Records.

Stephanie Brown

Her program for the BERA Concert will include Mozart's Sonata in C major, K.330; Ravel's Le Tombeau de Couperin; Villa-Lobos' Dansa do Indio Branca and Choros No. 5 (Alma Brasiliera); and Brahms' Sonata No. 1 in C major, Opus 1.

Admission is $6 for adults, $4 for students and senior citizens, and $3 for those under 18. For tickets and/or information, call Ext. 4643 or 2873.

Women in Science

Women in Science will hold a dinner meeting on February 2 at 5 p.m. in Room A, Berkner Hall. Phyllis Vineyard will be the guest speaker and will discuss Women in China, the International Women's Year Conference and the White House Conference on the Family.

The cost of the dinner, including wine, is $7. For information, call Eena Mai Franz, Bldg. 830, Ext. 7103.

Speakers Bureau

December - January

Vance Sailor (DEE); Informed Citizens Energy Task Force, "Nuclear Power," December 3, 1980.

Jane Setlow (Bio.); Suffolk County Science Teachers Association, "DNA Research at BNL," December 4, 1980.

Edward Mac Dougall (DNE); Bellport Rotary Club, "Passive Solar Heating," January 6.

R.C. Anderson (DO); Rotary Club of Moriches and Shirley, "Energy Options for the Future," January 20.

R.C. Anderson (DO); Port Jefferson Station Chamber of Commerce Symposium, Energy: Its Impact on Long Island's Economy, "Future Prospects for Energy Sources," January 29.

Cast Call

The BERA Theatre Group is issuing a call to all interested parties to come to auditions for the next production, probably to take place in early May. Two one-act seriocomedies will be presented: "God" by Woody Allen and "Feiffer's People" by Jules Feiffer. There are many parts available as well as several behind-the-scenes jobs. New-comers are particularly invited to participate.

Auditions will be held on Wednesday, February 4 in Berkner Hall, and Friday, February 6, in the North Room of Brookhaven Center. Both start at 8 p.m.

Arrivals & Departures

Arrivals

Juan R. Aguilar ..... Plant Engrg.
Ordel N. Best ..... Plant Engrg.
Bob Kam ..... Accelerator
Peter C. Keck ..... Biology
Douglas A. Pope ..... Accelerator
Oscar Renault ..... Central Shops
Anthony C. Sturcken ..... Plant Engrg.
Philippe G. Tardieu ..... Accelerator

Departures

Sun-Keun Hwang ..... Energy & Env.
James J. Jonke ..... Accelerator
Sitaram Kowtha ..... Accelerator
Thomas T.N. Nguyen ..... Physics

Semester Students

Doug Humphrey

Ten students arrived at Brookhaven this month to begin a semester of studies at the Lab. They are participating in the Brookhaven Semester Program, which offers educational opportunities that may not be available at their home campuses. This 26th semester of the program, the students will be studying physical chemistry with Ralph Weston, Chemistry Department, and biochemistry and molecular and cellular biology with Ed Popenoe, Medical Department. From left are Derrick Tartt, Alcorn State; Shirley Harris, Alcorn State; Renee Flack, BNL Student Coordinator; Elvira Sears, Texas College; Paulette Bryant, Hampton Institute; Vincent Harris, Tougaloo; Sharon Mitchell, Alcorn State; Donnie Evans, Tougaloo; Roger Jones, Arkansas; Richard Rayford, Grambling State; and Sandra McDowell, Alcorn State.

Kayaking

Kayak lessons are given by the Mountain Club on Sundays at 10 a.m. in the pool. Contact Harold Udseth, Ext. 4324, or Dick Watson, Ext. 3788, or sign up this Sunday.

Bowling

Purple & White League

The first night of the second half got off to a good start with many high games. Jim Griffin rolled a 629 series with games of 187/190/252. Bob Meiers rolled a 594 series with games of 231/178/185. Renee Flack had high game for the women with a 232. Other good games were bowled by Joe Mayeski 225, Ben Belligan 212, Bob Jones 202, James Petro 201, Caryl MacDougall 219, Pat Manzella 194, Ruth Sheehan 190, Mickey Haller 189.

Pink League

Carol Beckner bowled a 503 series with games of 179/168/156. Other good games were bowled by Mary-Grace Meier 183/158, Renie Rosati 182/161, Helen Keeley 175, Ellie Kristiansen 170/159, April Donegain 168, Karen Alberico 165, Millie Connelly 161, Deb Johnson 159, Madeline Windsor 158, Denise Miesell 152, Audrey Blake 150 and Maryann Larsen 147.

Red League

The Designers took 11 from the Trouble Shooters with J. Ferrante grossing 617, R. Occhiuzzo 608, A. Pinelli 604. The 76'ers won 8-3 over the Strangers with M. McKenna (225) grossing 622, R. Larsen (213) 609, F. Pond 619. The Sandbaggers split 6-5 with the Pinball Wizards. R. Meier grossed 625. This Isa Team took 4 against the Blue Jays with M. Iarocci (205/215) grossing 638, W. Kollmer 631, J. D'Ambra 629. The Freon Loaders took 3 from the Sparks. R. Marlow grossed 612, V. Bilms 608. The Old Timers lost 11 to the Old Timers II.

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position, with consideration given to candidates in the following order of priority: (1) present employees within the department, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants.

The determination of the best-qualified candidate for available positions will be based upon education, experience and other job-related criteria. Such factors will be evaluated and measured against the demonstrable requirements of the available vacancy, as well as the Laboratory's Affirmative Action objectives.

The Laboratory is committed to a policy of Equal Opportunity in its selection and placement of personnel. Its objective is equality of opportunity in employment, training, and promotion without regard to race, color, religion, national origin, sex or handicap.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all non-scientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment, as indicated below. Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Personnel Placement Supervisor, Ext. 2882.

LABORATORY RECRUITMENT: Opportunities for present Laboratory employees.

1554. MACHINE MAINTENANCE MECHANIC A, GROUP LEADER - Central Shops Division.

1555. HELPER A - Central Shops Division.

1556. MESSENGER - Staff Services Division.

1557. DESIGN ENGINEER - Will be checker for ISABELLE Design Group. Requires extensive background in machine design, cryogenics, hi-vacuum and welding. Must have in-depth knowledge of Machine Shop practice and strength of materials. Must be able to verify the dimensional accuracy and completeness of drawings and assure conformance to the standard drafting procedures for the ISABELLE Project. Accelerator Department/ISABELLE Project.

1558. SECRETARY - Requires AAS in secretarial science or equivalent experience performing diverse duties including the typing of technical reports utilizing a word processor. Will function as primary secretary for a large research group. Applied Mathematics Division.

OPEN RECRUITMENT: Opportunities for present Laboratory employees and outside applicants.

1559. SYSTEMS/DP ANALYST - Requires a bachelor's degree or its equivalent experience in system design and application programming utilizing data base techniques. Will be responsible for designing on-line business applications utilizing ANSI COBOL. Administrative and Data Processing Division.

1560. EXPERIMENTAL MACHINIST (four positions) - Requires experience in job print interpretation, layout, and machine set-up. Candidates must demonstrate ability and imagination in all phases of machine work. Will function as all-round machinist for non-production work in research and development shop. Project assignments range from raw material work in research to final assembly. Central Shops Division.

1561. PATROL OFFICER (three positions) - Requires AAS in criminal justice or equivalent experience performing diverse security duties for a large organization. Excellent communication skills are necessary as well as ability to work shifts. Will participate in comprehensive training program in order to become knowledgeable of site and police procedures. Safety and Environmental Protection Division.

1562. DEVELOPMENT ENGINEER - BSME or equivalent experience with a background in general machine design and high precision manufacturing processes. Knowledge of vacuum technology and computer programming desirable. Accelerator Department/ISABELLE Project.

Autos & Auto Supplies

74 VEGA - Sta. wgn. in running cond. $350. Ext. 7623.

73 HONDA - CB750K, excel cond, new contis, pipes, 16" wheel, quartz lite. Must sell. $1,050. 475-2090.

75 HONDA - Civic-CC, like new, 35 MPG, $500. on parts and labor recently. $2,500. Joe, Ext. 2898.

72 CHEVY VAN - V8, auto finished, no rust, good mech., new tires. $2,000. Jack, Ext. 4100.

1978 SUN-N-FUN CAMPER - 8 ft. fully self contained, like new, used 10 mos. $1,500. 475-1469 or Ext. 7317.

78 DATSUN - Pickup, 4 spd, am/fm cassette, white and blue cap. $3,550. 732-3350.

79 PONTIAC - Sunbird, excel cond, beige/black int, 4 spd, 4 cyl, excel gas mileage. $4,000. Firm. 751-5539.

75 PACER AMC - 46,000 orig. miles, good cond. $1,200. Frank, 744-9573.

TIRES - (2) Dunlop SP radials, 155-SR-14, good tread, $25/pr. Were on MG BGT. Bob, Ext. 3565.

SISSY BAR - for Honda up to 400cc. $20. Denis, Ext. 7601 lunchtime.

CAR RADIO - am/fm, new, Hitachi KMS 2411 Z, $25. Ext. 2831.

CAR RADIO - Chrysler am/fm radio, brand new. Bob. Ext. 4279.

75 COROLLA - 30 MPG, 4 spd, am/fm, radials, excel cond. Asking $1,950. Angelo DiDio, 286-0372.

77 RAM CHARGER - 4 WD, many options, 28,000 mi, no rust. $3,750. Sheldon, Ext. 3354.

70 FORD - Torino GT, 351 Cleveland, factory four barrel, dual exhaust, nice car. Asking $900. Charley, Ext. 7317 or 654-4895 Craig.

70 MARK III - Continental, very good cond, loaded, bronze ext, brown leather int. $2,800. Paul, Ext. 3277 or 298-4985 eves.

76 DATSUN - B210 Hatchback, 4 new wide radials, 8 trk player, mint cond, 39 MPG. $2,700. Ext. 7619 or 744-3509 eves.

79 CAMARO - Berlinnetta, a/t, a/c, p/s, p/b, am/fm 8 trk stereo, 15,500 mi, excel cond. Asking $5,975. Ext. 2256.

79 CORVETTE - silver w/oyster leather int, loaded, immaculate in and out. $9,500. 584-5779.

69 MUSTANG - Mach I, needs motor, many extras, new shocks, tires, complete front end work, 4 spd. console. Ext. 3319.

79 CORVETTE - fully loaded, T-roof, 4 spd. 581-4746.

79 RABBIT - Deluxe, silver w/red int, 5 spd, a/c. am/fm, reg. gas, 38,000 mi. Roger, Ext. 2384.

72 PLYMOUTH - Sta. wgn, a/c, p/s, p/b, a/t, no body rust, good cond. $650. 473-3084.

73 CHEVY - Caprice wgn, good work car, priced for quick sale. $200. Firm. Fred, Ext. 4407/35 or 499-1214 after 6 p.m.

79 CHEVY - 3/4 Ton Pickup, w/cap, p/s, p/b, am/fm and CB radio, (2) 20 gal. tanks. 363-6745 after 5 p.m.

SPARK PLUG - wire sets, 4-6-and 8 cyl. $5. per set. Bill S., Ext. 4434.

REAR WINDOW - for '69 Mustang Mach I, $40; also 351 Cleveland parts for 1970 model; Ford rims off Mach I Mustang, $75/set of 4, excel cond. Ext. 3319.

TIRES - Firestone GR-70-15, fair cond, $12. ea. Ron, 281-3149 after 5:30 p.m.

RIMS & SPOKE CAPS - for '77-'80 T-Bird, 15' rims, asking $200. Vinny, Ext. 7317 or 289-6785.

77 KAWASAKI 650 - headers, new tires, chain, sprocket, battery, many extras, mint, $1,800; also 1980 SUSUKI 550 - v.g. cond, low mi, well maintained, $1,100. 289-5744 after 6 p.m.

70 PONTIAC - Midas muffler, shocks, good snow tires, runs well. $450. Ext. 3835 or 878-1135.

69 VW - good running cond, powder blue. Ronnie, 732-6712 after 5 p.m.

72 FORD - Sta. wgn, p/s. p/b, excel mechanically, but some body dents. Arnie, Ext. 2606.

SNOW TIRES - (2) L78-15, w/w, on Plymouth rims, used 1 season. Cumming, Ext. 4343.

74 OLDS - Cutlass Salon, p/s. p/b, new exhaust, high mileage, dependable. $1,000. neg. Debbie, Ext. 3146.

SNOW TIRES - (4) L78-15 Firestone on Jeep CT5-7 wheels. $100/lot. 363-6121 after 6 p.m.

73 PLYMOUTH - Duster "340" rebuilt eng. and trans, good body, runs well. 924-8309 eves.

76 CHEVY - Malibu CVlassic, excel cond, good MPG, a/c, p/s, p/b, stereo, extras. Asking, $2,790. Ext. 2256.

72 PLYMOUTH - Fury, 2 dr, r/h. p/b. p/s. good cond. Asking $600. Ext. 2914, 286-3742 eves/wkends.

80 RABBIT - "L", 4 dr, 4 spd, am/fm, polyglycoat rust proofing, 14,500 mi. $5,800. John, Ext. 4973.

76 DATSUN - B210, 39 MPG, 4 new tires, clean. $2,350. Ext. 7619 or 744-3509 eves.

80 DODGE - Omni 024, sunroof, am/fm stereo, 8 trk, rust proof, many extras, 30+ MPG, mint, reasonable. 878-1731.

Boats & Marine Supplies

GARVEY - 18' 40 HP Johnson, good cond, 3 clam rakes, tongs, crab dredge, misc. $900. John, Ext. 3292 or Jeff, 286-1348.

BOAT TRAILER - tire size 4.80-12" w/rim, new. $40. John, Ext. 4312.

Miscellaneous

MEDITERRANEAN - triple dresser and mirror, excel cond. Delivered. $300. 744-8680.

BLACK PERSIAN - Lamb coat, mink collar, size 12. $125. 475-0126 after 5 p.m.

FREEZER - Admiral 15.8 cu. ft. w/no scuff door, brand new. $200. 654-4895.

STEAM IRON - good cond, $8; 4 slice toaster, good cond. $8. John, Ext. 3292.

ISLANDERS VS. CHICAGO - (2) tickets, Feb. 21st. $26. also Fisher 450T receiver, 55 watts RMS per channel, autoscan, some FM drift. $100. Rick, Ext. 7102.

SEWING MACHINE - Singer portable Fashion Mate Zig Zag, very good cond. $50. 369-2504.

SKI BOOTS - men's Caber competition size 8½, blue, used once. $50. Joe, Ext. 4069 or 261-7825.

EASTERN AIRLINES - half fare coupon to California, $35. Ext. 3835 days or 878-1135 eves or wkends.

TICKETS - (2) to the Boston Symphony Orchestra front of Parquet Carnegie Hall. March 5, 1981. Ext. 3922.

HI FI - 54" Magnavox am/fm phono, excel cond. Asking $175. Ext. 2979 or 345-3237 after 5:30 p.m.

QUARTZ HEATERS - new design, one year guarantee, 924-4991.

FURNITURE - walnut bedroom set, women's dresser, man's chest, night tables, good cond. $100/set. 581-4238.

SOLAR PANELS - (4) copper piping, double glazed, 17 sq. ft. high efficiency. John, Ext. 4129.

KEROSENE HEATER - Noble warm Night, 9000 BTU's, removable tank, never lit. $165. Ron, 581-0468 eves.

ICE SKATES - boy's excel cond, size 4, $10. or best offer. Ext. 2914 or 286-3742 eves/wkends.

SKATES - boy's size 5, figure skates, excel cond, $12; skates, boy's size 9, Baur Hockey skates, like new, $20. Bob, Ext. 4279.

POPULAR MECHANICS MAGAZINE - 1957-1974 complete. Dennis, Ext. 4259 or 736-2534 eves.

LP GAS FURNACE - 49,000 BTU, good for small house, garage, workshop. Susan, Tues.-Thurs. Ext. 7235 or 399-0132 after 6 p.m.

SKIIS - 1 pair Holiday, length 210, Look bindings. $20. 732-3350.

HELIO'S - German sliding Vernier caliper 6"; (2) 1" micrometers (1 tube) and (1) 4" micrometer. Ext. 4606.

CRIB - w/mattress, $50; Perego carriage w/mattress, $50; baby changing table, $25. Ext. 3469 or 281-4371.

ICE SKATES - girl's figure size 1, never worn, white, tempered steel. $10. Julie, Ext. 2593 or 929-6460.

SNOW SUITS - boy's size 6X, girl's size 6, like new, cost $20. ea. now $5. ea. Richie, Ext. 4254 or 734-7342.

ALUM STORM WINDOWS - (3) 36"x28¾", (1) 31"x46", $25. all. Ext. 3848 or 472-0553.

SKI BOOTS - child's size 12, $5. Bob, Ext. 4672 or 929-4753.

BAR - white top, black leather front, 5' long, 20" wide, 38" high, shelf in back. $100. or best offer. 281-1343.

COLONIAL - 5 light chandelier, hobnail milk glass and brass, excel cond. $50. I. Merritt, 589-5126.

CONTEMPORARY - coffee & end tables, like new, $300; 2 pc. sectional, 9' and 5', good cond. $475. 924-7484 after 6 p.m.

WOOD STOVE - American made, airtight, heats 1500 sq. ft. Sacrifice $200. Bob, Ext. 4551 or 289-2159.

SKI BOOTS - 'Hanson' hardly used, like new shoe size 9-10 Hanson Shell size 3, $100. Firm. 744-0716 after 6.

ORGAN - Wurlitzer, double key-board music box. $1,000. 878-1085.

CARPET - orange, 12'x14', w/pads. $95. 929-4886 after 5 p.m.

SKI BOOTS - men's 8½ new Le Trappeur, black plastic. $45. Ext. 4727.

KING SIZE - brass scroll headboard w/split bedframe. $50 Bob, Ext. 4201.

DELUXE SLR CAMERA CASE - holds 2 lenses and access, brown, excel cond, hardly used. $20. 669-9482.

CLOTHES DRYER - heavy duty, G.E. Model 5300, 3 cycles. $100; Sewing Machine, Super Deluxe Zig Zig Morse, Model 5100 w/access. $60. Marty, Ext. 3563 or 286-0478.

VALENTINE PILLOWS - 14" heart red quilted w/lace or white heart w/I Love You. $12. ea. Sharon, 878-4426.

SNOW PLOW - 6' blade w/hydraulics, pump, piston. Ideal for Bronco Jeep. Good cond. $375. 289-0413.

CAMERA - Keystone 125X, $15; Hockey skates, size 8, $5. Ron, 281-3149 after 5:30 p.m.

CAR SEAT - G.M. Love, Hedstrom Jumper/walker, chair infant seat. All for $50. 744-3567 after 5 p.m.

FREEZER - Sears upright, 6 ft. excel cond. $225. 878-2042.

TYPEWRITER - portable, excel cond w/case, Olympia, $45; Sewing Machine Morse, portable w/case, good cond, vari-stitch. $50. 473-3084.

WASHING MACHINE - Hotpoint, white heavy duty, 2 cycle. $75. 928-9568.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed or national origin of the applicant.

For Sale

BROOKHAVEN HAMLET - 3 bdrm Ranch, 2 baths, fin. bsmt, fully insul, will hold mortg. Rent w/option to buy. $45,000. 286-1197 eves.

MANORVILLE - 3 bdrm Ranch, 1 acre, country kit, 1½ baths, full bsmt, all appli, assumable mtg. at negotiable rate. $41,000. Pete, Ext. 3868/4574 or 878-1225.

CENTER MORICHES - 3 bdrm Ranch, full bsmt, att. garage, 110x145 property, circle turn dead end street, S. Cntr. Moriches. $50,000. 878-1085.

For Rent

MASTIC PARK - 1 bdrm apt. $240/mo. util. incl., single, security, references. 281-7844.

POCONO'S - Chalet w/fp, sleeps 6, ski Tanglewood, mid-wk avail. in Feb, or plan spring vacation. Bob, Ext. 4551 or 289-2159.

N. CONWAY, N.H. - Ski house, 5 bdrm, sleeps 10 plus, 3 baths, 2 fireplaces, laundry, TV, 5 miles to Wildcat, Cranmore, Attitach. $500/wk or $225/wkend. Ext. 7949 or 617-443-5591.

N. SHIRLEY - attractive apt. furnished, priv. entr, util. incl, excel location, 5 min. from Lab and stores, mature working gentleman. Security. $285/mo. pays all. 281-8044.

GREENPORT - 1 bdrm apt, outdoor porch, carpeted, $200/mo. plus util; 2 rm studio apt, separate kitchen, $160/mo. plus util. 1 yr. lease. 757-8898 after 6 p.m.

HOLTSVILLE - 2 bdrm Condo, near expressway, pool, 5 appliances, gas heat/hot water. $395/mo. 698-8626.

MANORVILLE - 1 bdrm apt, available April 20th to Sept. 20th. Lease renewable after. $312/mo. includes heat, hot water, carpeted, a/c, diswasher. Ext. 3835 days, 878-1135 eves.

MASTIC - 1 bdrm apt., $250, plus utility. Business couple or single. 281-5476.

Car Pools

BROOKHAVEN HAMLET - driver needed to fill 4 man car pool, 8:30-5:15 p.m. John, Ext. 3292 or Ron, Ext. 3887.

WADING RIVER - driver to join existing car pool. Lewin Hills area. Betty, Ext. 3156.

Lost & Found

FOUND - automobile key, front of Chem. Bldg. Ext. 2522.

Wanted

ANY PARTS - for Nova's '68-'72, interiors, transmissions, anything. Charley, Ext. 7317 or 473-8632.

BABY CARRIAGE - in very good cond. Maria, 924-3756.

BICYCLE TIRES - 26"x2.25"; pressure canner w/gage. Bob, Ext. 3565 or 924-9210.

ICE SKATES - men's shoe size 6½E. Adrienne, Ext. 4393.

TABLE SAW - 10 in. good working cond. Ken, Ext. 3574 or 472-3329 after 6 p.m.

RAMBLER AMERICAN - '67-'69, 2 dr. hard top, needed for body parts, up to $100. Joe, Ext. 4254 or 281-7683.

ICE SKATES/X-COUNTRY SKI BOOTS - childrens sizes 12 - 3. John. Ext. 4129.

DRAFTING TABLE - good cond. Ted, Ext. 4589.

EXERCISE BICYCLE - good cond. Ext. 4068.

BOXES - cartons for moving. Dennis, Ext. 4259 or 736-2534 after 6 p.m.

AMBITIOUS PERSON - for a business venture, no investment risk, for interview call 732-6647.

ICE SKATES - boy's size 5. Joan, Ext. 3135.

ROOMMATE - to share 2 bdrm house, Mastic Beach, fp, washer/dryer. $225/mo. 399-1401 after 6 p.m.

UPRIGHT VACUUM CLEANER - that works well and is reasonably priced. Betty, Ext. 3156.

BOYS BICYCLE - small; boy's roller skates size 3. Liz, Ext. 2082.

TEMPORARY HOME - for loveable 5 yr. old black Labrador retriever. We pay expenses. Marian, Ext. 3552.

BABYSITTER - my home for 1 child. Ext. 7738.

HOUSEKEEPER - meet school bus, feed children, make supper; must be reliable, own trans. required; Shoreham area, M-F, 2:30-6 p.m. 744-4611 after 7 p.m.

BMW 2002 - 1971 through 1973, reasonable. Ext. 3316 or 698-1362 after 6 p.m.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommended by the *Bulletin*.

AUTO CLEANING - and minor paint and body work, reasonable, 10 yrs. experience. 475-1469 eves.

TILE WORK - cement, terrazzo, tile, reasonable rates. Don, 281-8848 or John, Ext. 3292.

TUTOR - prepare now for Regents w/professional. Chemistry, Biology, Algebra, Geometry and Physics. Babette, Ext. 3419.

BABYSITTING - want to babysit child 2-5 yrs. Will give lots of TLC. Dawn, 924-8297.

LOG SPLITTING - by machine, no job too big or small, very reasonable. HR2-1875 after 5:30 p.m.

KEROSENE HEATERS REPAIRED - most brands, parts, overhauls. Ron, 581-0468 eves.

PILLOWS - custom patchwork by Un-Hee. 736-2534.

PET BEHAVIOUR CONSULTANTS - Problem with a pet? Call a professional for advice. 399-3882.

TAXES - prepared by Tax consultant, your home or mine, reasonable. John, 732-2472.

FIRESIDE CHIMNEY SWEEPS - professional cleaning of all types of flues, prevent chimney fires. Lab discount. Bill, 584-6425.

FRENCH & GERMAN CLASSES - few places available. All levels. Session $3.00 group of 8. Ext. 4253 or 928-4926.

CARPET CLEANING - any 2 rooms $39. All work guaranteed. Terry, 499-8377.

PROFESSIONAL TYPING - Ext. 2484 or 289-9560.

SKI CANON MT. - in Franconia, New Hampshire. Call Annamarie for details. You drive. 473-9016.

PIANO TUNING - and repair, reasonable rates and conscientious service. 751-4985.