BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

The Fifth Force: A Cliff-Hanger

Senior Physicist Peter Thieberger spent several weeks during the summer of 1986 sleeping on the floor of a camper overlooking the Palisades of the Hudson River. Nearby, a hollow copper ball floating in a tank of water drifted slowly towards the cliff's edge.

As the ball moved, a video camera recorded what may be the first modern evidence of a fifth force in the universe.

As evidence from other experiments is added to Thieberger's data, theorists may eventually find the characteristics of the fifth force useful for completing a unified field theory, which would explain all forces as manifestations of the same force.

Going Against Gravity

Most physicists currently think that there are four forces in the universe: electromagnetic, strong, weak and gravity. One manifestation of the electromagnetic force is everyday magnetism. The strong force holds the atomic nucleus together, while the weak force governs the production and decay of many particles. Gravity is responsible for the weight of matter and the motions of the stars and planets.

Physicists Samuel Aronson, Associate Chairman of BNL's Physics Department, and Ephraim Fischbach, Purdue University, along with their colleagues, were the first to suggest that there might be experimental evidence for a fifth force.

In a January 1986 paper published in *Physical Review Letters*, they had concluded that a 65-year-old experiment by Roland von Eötvös that was thought to prove that gravity affects all objects equally, had, in fact, demonstrated just the opposite. They postulated that a heretofore overlooked force, whose effects had been commonly explained away as experimental error, was responsible for repulsion between objects.

At short distances, estimated to be less than a mile, this force would seem to work against gravity, for example, to slow the velocity of a falling object. The force would be coupled to the number of nucleons in the object, rather than to its mass. Since iron and copper contain a larger number of nucleons per unit mass than other elements, iron or copper objects would fall with slightly smaller acceleration.

To the Cliff's Edge

Thieberger, who heads BNL's Tandem Van de Graaff Accelerator, was drawn to the cliff's edge after reading Aronson and Fischbach's paper. "I realized that asymmetrical masses like nearby hills or mountains could have affected the Eötvös experiment," Thieberger said.

In a paper discussing Aronson and Fischbach's conclusions, "I suggested doing experiments near a large cliff to determine if the force exists or not," he explained.

"If the cliff exerted a force that was different for copper and for water, the result would be the sideways movement of the floating object," said Thieberger. "This could not happen in a symmetrical situation with another mass exerting an equal and opposite force." The suggestion to conduct the experiment at the Palisades came from the late Physics Department Chairman Arthur Schwarzschild.

The results of Thieberger's videotaped cliff-side investigations were published in *Physical Review Letters* last March, but he is not rushing into any hasty conclusions based upon initial data. Thieberger says, "I obtained experimental results for which there seems to be no conventional explanation. I present the data that were obtained, explain the experiments performed and their possible implications."

Mort Rosen

Irving Feigenbaum (left) and Peter Thieberger outside their experiment at the AGS.

Sensitive but Rugged

To detect a possible fifth force, Thieberger and Irving Feigenbaum, Senior Technical Supervisor at the Tandem, constructed a sensitive instrument that was rugged enough to be transported to cliff-side.

The experimenters rejected using a torsion balance like the instrument Eötvös used because it would be too fragile and expensive. Instead, the pair became the first to use a copper ball floating in water, an experimental setup that had been proposed many years ago.

To test the effect of the fifth force on different substances, Thieberger chose copper and water because, in Eötvös's experiments, they showed the largest deviation from expected results.

Though the accelerometer that Thieberger and Feigenbaum built is quite sensitive, it can measure only the difference in the force affecting copper and water. In interpreting the data, therefore, Thieberger cannot say whether the force attracts or repels. He can only say that there is a difference in the action of the force upon copper and water, and, hence, the ball moved.

Fields and Currents

To arrive at this conclusion, Thieberger removed possible sources of error. His major worries were magnetic fields acting on the copper ball and convection currents inside the tank of water.

After magnetic shielding was placed around the tank, magnetic fields could not penetrate to the water tank, as testing with control fields proved. By maintaining a uniform cold temperature, around 4°C, the researchers stopped the convection currents plaguing the experiment at room temperature.

Once the experiment could proceed, Thieberger taped his evidence for the fifth force: the copper ball moving at a constant speed from one side of the tank towards the other. The velocity of the sphere, he suggests, would measure the strength of the fifth force.

For this experiment, Thieberger and Feigenbaum received assistance from Project Engineer Mario Manni, who did the detailed design and found a way to have the copper sphere precisely fabricated, and from Senior Technical Supervisor Charles Carlson, who, with several Tandem operators, helped with the installation at the Palisades.

In addition, Senior Technical Supervisor Robert Lindgren drove the camper, which had been borrowed from the Department of Applied Science, and helped with the installation. On two occasions, he relieved Thieberger by staying with the experiment overnight.

Also, Senior Physicist Harvey Wegner spent a weekend, helping to provide the experiment with electric power, through what he called "the world's largest extension cord," hooked up to a nearby concession stand. Senior Physicist Chellis Chasman participated in many useful discussions throughout the experiment.

A Repeat Next Spring

Thieberger is planning to repeat the experiment in the spring. In the meantime, he and Feigenbaum are repeating the experiment on site, primarily testing and fine-tuning their instruments. In place of the cliffs of the Palisades, they are using the mass of a 10,000-ton pile of steel blocks sitting just north of the Alternating Gradient Synchrotron.

In addition to confirming last summer's results, Thieberger hopes that next spring's study might allow the collaborators to measure the range of the fifth force and to confirm or refute the current preliminary estimates ranging from a few feet to a few thousand feet.

Regarding other current thinking about the fifth force, Thieberger said, "I should mention that there has been considerable skepticism in the community, and that is healthy and justified," he said. "Future experiments will tell if this thing is real or not."

— Ric Lewit

Towards a Post-Industrial Economy

The U.S. economy is changing from one producing goods to one offering services. The biggest service being provided is information, and an information-based economy gives different challenges and headaches to management and labor.

Economist Anne Carter will address the recent, radical changes in the U.S. economy and the problems that the country's economic transition poses in the talk "Know-How Trading as Economic Exchange," on Friday, October 30, at 3:30 p.m., in the Hamilton Seminar Room, Chemistry, Bldg. 555. This is the first in a series of lectures this fiscal year sponsored by Brookhaven Women in Science, and all are invited to attend.

Carter is chair of the Department of Economics at Brandeis University, where she has been a professor in that department since 1972. Before that, she was associated with the Harvard Economic Research Project, serving as its director from 1968-72.

Carter's research includes assessing and analyzing energy production and demand. As a result, in the 1970's, she developed a model of the world energy situation for the United Nations.

After being graduated summa cum laude from Queens College in 1945, Carter earned her Ph.D. in economics from Harvard University in 1949. In addition to other professional activities, she has been a member of the Electric Power Research Institute Advisory Council since 1985. She is a Fellow of the American Association for the Advancement of Science and the Econometric Society.

Prior to the lecture, there will be a luncheon in Carter's honor in Room A, Berkner Hall. The cost is $10 per person. For reservations call Carmen Benkovitz, Ext. 4135.

Anne Carter

BNL's United Way Goal: $87,000 for 1987

Is $87,000 a tall order for Lab employees to donate to the United Way, now in its 100th year?

Not according to Trudi Neuhoff, Department of Applied Science, this year's BNL United Way Campaign Chair. Last year, Lab contributions totaled over $76,000 — and that sum came from only one-third of all employees.

"The successful fund drive last year jumped the previous year's total by $10,000," said Neuhoff. "I believe there are enough BNLers and their families who can give a small extra contribution and potentially enough new donors for us to make another leap."

She added, "More people are now aware of how much and what great help is being given through the United Way. Cuts in other funds are closing many programs, so we should try to give a little more, and get new contributors. I'm sure we'll do it."

Neuhoff pointed out that, for each dollar given to the United Way, 88¢ goes directly to help people. "The administrative costs are kept low because there are so many volunteers," she explained. "And people are certainly being helped. Last year 1,264,642 Long Islanders used these services."

One very easy way to use the United Way is just to call their hot line — (516) 249-1100 — for advice on which service would be the most appropriate. "Problems arise so unexpectedly," said Neuhoff. "People who never expect to need help suddenly find, for example, that they need at-home care in their own family. Giving to the United Way keeps these services available for all of us."

— Liz Seubert

Mort Rosen

To demonstrate how funds flow from BNL donors, to the United Way, to agencies that help people in need all over Long Island, there is a new sign. It was designed by Frank De Rosa (right), Sign Painter in the Plant Engineering Division, and the organizing committee helping BNL United Way Chair Trudi Neuhoff (left). Now on display at the main gate, the sign will remain "until it's not needed because we've made the goal," said De Rosa. "I hope that's soon!"

BNL's Fabulous Forty

The BNL we know today is the sum of thousands of events that have taken place here since 1947. This sampling shows the variety of events — from the monumental to the minor — that have occurred during the months of September and October during the Lab's 40 year history.

October 16-18, 1947 — A Biology and Medicine Conference brought 400 people to BNL.

October 14, 1948 — Leland J. Haworth became BNL's second director.

September 1951 — The Metallurgical Division of the Reactor Science and Engineering Department moved into the first building constructed under the Lab's contract with the Atomic Energy Commission.

October 14, 1953 — A paper was published describing the first positive identification of some tissues in which antibodies actually are formed, an experiment done at BNL by Richard Stoner and William Hale.

September 14, 1959 — The first George B. Pegram Lectures were delivered by physicist Lee A. DuBridge.

September 12, 1960 — Hurricane Donna passed over BNL at 3:45 p.m. with peak speeds of 90 mph. Total rainfall was 4.64 inches.

September 13, 1961 — The Alternating Gradient Synchrotron (AGS), then the world's largest and most powerful particle accelerator, was dedicated.

September 15, 1961 — Ground was broken for the construction of the High Flux Beam Reactor (HFBR).

September 28, 1962 — Ground was broken for the new Instrumentation and Health Physics Building, Bldg. 535.

September 1, 1965 — The world's first superconducting, quadrupole magnetic lens, which was designed and constructed at BNL, was successfully tested, the Bulletin Board reported.

September 29, 1965 — Responsibility for the Bulletin Board transferred from the Personnel Division to the Public Information Office.

October 4, 1965 — The Upton Nursery School opened for the first time.

October 20, 1965 — Ground was broken for the gas station.

October 31, 1965 — The HFBR reached its first self-sustaining nuclear chain reaction.

September 15, 1966 — The Bulletin Board announced the signing of a $3.75 million contract for the construction of the Tandem Van de Graaff Building, Bldg. 911, which began with an early October ground-breaking ceremony.

October 14, 1966 — The Chemistry Building, Bldg. 555, was dedicated.

September 7, 1967 — A BNL experiment using the radiosensitive plant *Tradescantia* was launched into space with a NASA Biosatellite.

September 21, 1967 — BNL researchers George Cotzias and Paul Papavasiliou reported encouraging progress in using L-Dopa for the treatment of Parkinson's disease.

September 9, 1968 — Some 950 employees had lunch in the new Cafeteria on its first day of operation.

September 16, 1968 — 50 scientists attended the first conference held in Berkner Hall, the Cross Section Evaluation Working Group.

October 13-15, 1971 — The 25th anniversary of BNL/AUI was celebrated.

October 16, 1973 — The first off-site shipment of a radioisotope, a sample of iron-52, was sent from the Brookhaven Linear Isotope Producer (BLIP) to the National Institutes of Health in Washington, D.C.

October 28, 1973 — A field of 52 — 25 runners and 27 bicyclists — was entered in BNL's Third Marathon and First Bike-a-Thon.

October 4, 1974 — The 80-Inch Bubble Chamber closed down after 11 years of operation, the Bulletin reported.

October 18, 1976 — It was announced that Samuel C.C. Ting would receive the Nobel Prize in physics for his discovery of the J particle, in an experiment done at the AGS in 1974.

October 1, 1977 — In Washington, The Energy Research and Development Administration was phased out in favor of the Department of Energy. At BNL, The Department of Applied Science (DAS) was regrouped into the Department of Nuclear Energy and the Department of Energy and Environment (DEE). In May 1983, DEE was renamed DAS.

September 28, 1978 — Ground-breaking ceremonies were held for the National Synchrotron Light Source.

October 27, 1978 — Ground-breaking ceremonies were held for the ISABELLE Project.

September 10, 1980 — The Brookhaven House was dedicated.

October 17, 1980 — The Bulletin reported that James Cronin and Val Fitch would receive the 1980 Nobel Prize in physics for discovering CP violation in 1963, in an AGS experiment.

September 26, 1981 — New York Governor Hugh Carey came to BNL to announce that the Power Authority of the State of New York would provide up to 30 megawatts of power to BNL, for an annual Lab savings of about $6 million.

October 31, 1982 — The Power Transmission Project reached full power — 330 megavolt amperes on each of two cables at the test facility.

October 16, 1984 — A ground-breaking ceremony was held for the beam transfer line to link the AGS and the Tandem Van de Graaff.

September 17, 1985 — Design D, a superconducting magnet design by Brookhaven, Lawrence Berkeley and Fermi National Laboratories, was chosen as the focus of future magnet R&D for the proposed Superconducting Super Collider.

September 27, 1985 — Hurricane Gloria visited Long Island. BNL meteorologists recorded a top speed of 100 mph, and the Lab weathered the storm better than most.

October 25, 1986 — For the first time since the completion of the transfer line from the Tandem, heavy ions were extracted from the AGS ring and sent down a beam line to an experimental area.

September 9-11, 1987 — BNL celebrated its first 40 years.

September 21, 1987 — Phase II of the National Synchrotron Light Source was dedicated.

October 10-11, 1969 — This 12-gram piece of lunar rock brought back from the moon by the Apollo 11 astronauts was put on public display in the Brookhaven Center. It was one of $32 million worth of moon rocks brought to BNL and the State University of New York at Stony Brook for examination.

Time to Fall Back

Eastern Standard Time returns this Sunday, October 25, at 2 a.m. So don't forget to fall back, that is, set your clock back one hour before going to sleep Saturday night. If you remember, you can enjoy that extra hour in bed Sunday morning. If you forget, however, you'll arrive an hour early at your destination, be it Sunday church services or a Masters swim meet.

Reports Available

The following reports are now available to the Laboratory staff and to affiliates of the DOE, AUI and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Dept. of Commerce, 5285 Port Royal Rd., Springfield, VA 22161. Staff members should call the designated contact at the extension listed.

BNL-NCS-51771
First Edition
Supplement Three
Contact: A. Lopez, Ext. 2902
Integral Charged Particle Nuclear Data Bibliography. Literature Scanned from April 1, 1986 through April 10, 1987. N.E. Holden, et al.

BNL-51916 Vol. 2
Contact: D. Cange, Ext. 4142
Preconditioned Iterative Methods Applied to Singularly Perturbed Elliptic Boundary Value Problems. E.I. Goldstein

NUREG/CR-4810
BNL-NUREG-52022
Contact: J. Danko, Ext. 7125
Evaluation of Diesel Unavailability and Risk Effective Surveillance Test Intervals. W.E. Vesely, et al.

NUREG/CR-4884
BNL-NUREG-52063
Contact: L. Morrison, Ext. 4208
Interpretation of Bioassay Measurements. E.T. Lessard, et. al.

NUREG/CR-4982
BNL-NUREG-52093
Contact: S. Flippen, Ext. 2507
Severe Accidents in Spent Fuel Pools in Support of Generic Safety Issue 82. V.L. Sailor, et al.

BNL-52096
Contact: D. Tooker, Ext. 2103
Report of the Workshop on Transferring X-Ray Lithography Synchrotron (XLS) Technology to Industry. Held at BNL July 8, 1987. W. Marcuse.

NUREG/CR-2331
BNL-NUREG-51454
Vol. 6 #4
Contact: A. Weiss, Ext. 4473
Safety Research Programs Sponsored by Office of Nuclear Regulatory Research. Quarterly Progress Report Oct. 1 - Dec. 31, 1986. A.J. Weiss et al.

BNL-52015
Contact: L. Thompson, Ext. 5068
The First Forty Years. Editor: M.S. Rowe.

BERA News

Coming Up

Music by Haydn, Beethoven and Mendelssohn are on the program for a concert by the Cremona Arts Trio, to be held on Thursday, November 5, at 8:30 p.m., in Berkner Hall.

Cooking Exchange

The next Cooking Exchange meeting will be held October 28 at the Recreation Building in the apartment area. Rooshi Khalio will demonstrate Indian cookery. Among the dishes to be prepared are a vegetable curry, a dal, eggplant bharta, pulav, carrot halwa (an Indian sweet) and an Indian bread. Spices are used very successfully in Indian cookery, and the cooks for this meeting will be preparing some very flavorful food.

The meeting will be from 12:30 p.m. to 2:30 p.m. A fee of $2 per person will be charged, allowing each person to sample the dishes prepared after the demonstration. All employees working on site and family members are welcome. Babysitting is available, for 50¢ per child.

Bowling

Red/Green League

J. Ferrante rolled a 266/628 scratch series, J. Mayeski 245/617 scratch, E. Sperry IV 241, D. Jesaitis 233/203, T. Prach 227/211/608 scratch, E. Meier 223, J. Muller 216, N. Parrinello 211, M. Guacci 209, N. Combatti 206, H. Arnesen 202, A. Pinelli 200.

Pink League

High games were bowled by Sandy Asselta 200, Maryann Reynolds 191, Ann Parrinello 182, Maria Apelskog 167.

White League

Jeannette Thiede had a 232/573 scratch, Ed Sperry IV 213, J. Griffin 213, Frank Gaetan 219/210, Lorraine Petro 202, Kay Conkling 202, Ken Asselta 201, Pat Manzella 191, Alice Alberico 189, Maria Apelskog 185.

Purple League

Ed Meier bowled a 205, Marge Stoeckel 191/181/552 scratch, Jeanne Penoyar 190, Mary Addessi 183.

Employees' Crafts on Display

"Quality work" was the decision of the judges. Though the BERA Employee Craft Exhibit was not formally judged, those who viewed the varied examples of leisure-time productivity rated them highly. Twenty-two employees exhibited their wares, including Joe Hanson and Irma Reilly, both in the Photography & Graphic Arts Division.

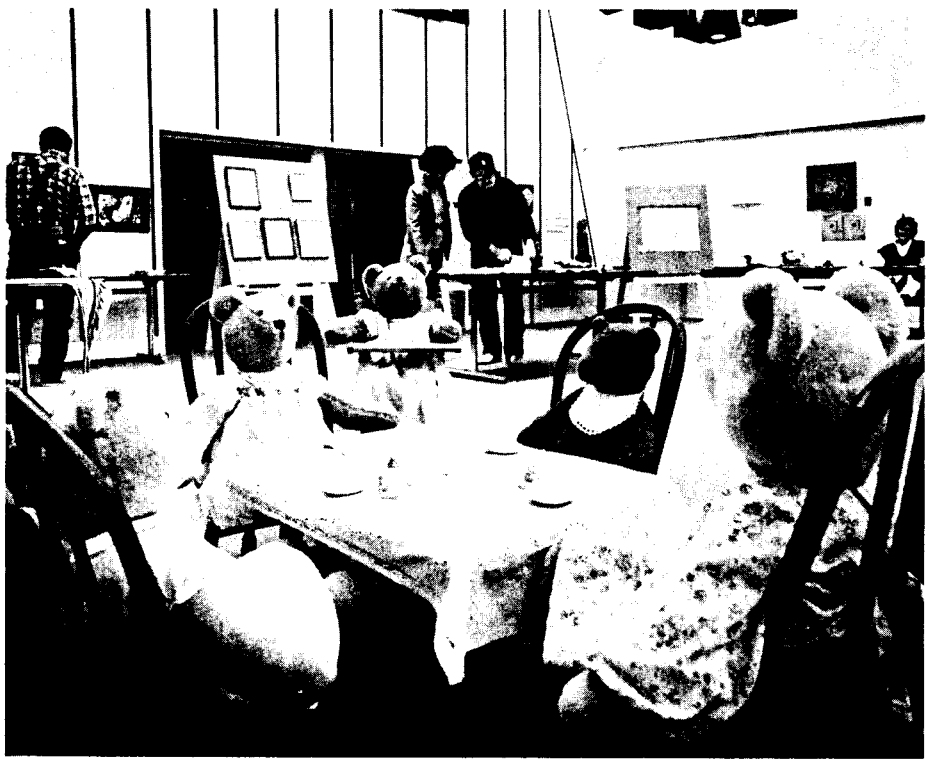
Hanson displayed five of his hand-carved birds. He is pictured holding a life-size sculpture of a male and female pair of cardinals, which is being admired by Jan Rohrer, wife of Parke Rohrer, Director's Office.

Working from pictures of live creatures, Hanson whittles his birds out of bass wood, carving in all the feather details before painting them with acrylics. Each bird requires 40-50 hours of Hanson's spare time, time he finds well spent and relaxing. Hanson learned the craft several years ago from BNL retiree Phil Miller.

The five hand-sewn teddy bears at tea, along with six others, were exhibited by Reilly. About five years ago, Reilly's hobby of collecting old, stuffed bears evolved into her sewing new, 18-to-20-inch ones based on original patterns for such famous bears as the Theodore Roosevelt bear, Paddington Bear and Winnie-the-Pooh.

After cutting out the material with small scissors, so as not to shear the plush fur, Reilly backstitches the seams and then stuffs the bear, head first, then body, then arms and legs. She finishes each with an embroidered mouth and nose, and glass eyes. She enjoys having a teddy on her lap as she works on it and having a portable craft.

Photos by Mort Rosen



Social Club

The Social Club has scheduled a sightseeing, skiing and shopping trip to Badgastein, Austria, from February 19 through February 27. The cost of $900 per person includes seven nights and eight days at the Savoy Hotel, which is located three minutes from the center of town and has an indoor thermal pool, sauna, and ski lift; round trip airfare from JFK Airport to Munich, via Lufthansa Airlines; transportation from Munich to Badgastein, Austria; breakfast and dinner each day; and all local taxes and hotel gratuities.

Only eight double rooms are available. A $200 deposit must be in by November 3, with the balance due by December 30.

With a great railway service, Badgastein is ideally located for touring. There is a large health center across from the ski area, as well as lively nightlife, a gambling casino, beautiful cross-country ski areas and much more. For more information, call Doris Terry, Ext. 2228, or stop by Bldg. 197C to see pictures of Badgastein.

P-CAD Seminar

Doug Marks from P-CAD will conduct a P-CAD Seminar on Thursday, October 29, in the Physics Seminar Room, Bldg. 510, from 9 a.m. to 4 p.m., with a lunch break from 11:45 a.m. to 1:15 p.m.

This seminar will focus primarily on P-CAD Utilities, as an extension of the CAE-1 course previously held on site. However, anyone interested in P-CAD is welcome to attend. The Utilities presentation and discussion will be held during the morning session. Time will be allotted for general questions in the afternoon.

Marks will return in November to address questions on P-CAD placement and routing; a date will be announced soon. For more information, call Rich Carlsen, Ext. 4172.

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IBEW Meeting

Local 2230, IBEW, will hold its regular monthly meeting on Monday, October 26, at 6 p.m., in the Knights of Columbus Hall, Railroad Avenue, Patchogue. On the agenda will be regular business, committee reports and the president's report.

SUNY at Stony Brook Offers WIS Lectures

During the 1987-88 academic year, the Women's Studies Program at the State University of New York (SUNY) at Stony is offering a new series of free, public lectures on women in science and engineering.

The two lectures on the fall schedule will both be held in the Javits Lecture Center 101 at 8 p.m. They are:

- Thursday, November 5 — Bonnie Spanier, Assistant Professor and Director of Women's Studies, SUNY at Albany, and editor of *Toward a Balanced Curriculum*. She will address the question: "How Can the Study of Women and Gender Be Integrated Into the Science Curriculum?"
- Tuesday, December 1 — Margaret Rossiter, Visiting Professor in the Program on History and Philosophy of Science at Cornell University and author of *American Women Scientists: Struggles and Strategies to 1940*. She will speak about, "What Has Happened to Women Scientists Since 1940?"

Equipment Demo

Cascade Control will host a demonstration of PC-based data acquisition, control and instrumentation systems, on Monday, October 26, from 10 a.m. to 3 p.m., in Berkner Hall. On display will be integrated, menu-driven software for real-time and post-processing applications, and hardware with digitizing speeds to 20 megahertz and accuracy to 16 bits. All the exhibited hardware can be set up to acquire, generate, store or process data without writing a single line of code.

Local Users Group

The next meeting of the Upton Local Users Group will be held on Wednesday, October 28, at 11 a.m., in Room B, Berkner Hall. At this meeting, there will be a presentation by EMC Corp. on the optical disk storage systems. For information, call Zohreh Parsa, Ext. 4748.

Correction

In last week's story on the ICFA Seminar held at BNL, the identities of panel participants Herwig Schopper, CERN, and Nikolai Tyurin, Serpukov, USSR, were transposed in the photo caption. Also, in the caption accompanying the photo of the Organizing Committee, Seminar Secretary Pat Tuttle was standing second from left.

Cafeteria Menu

Week of October 26

Monday, October 26		
Tomato rice soup	(cup)	.75
	(bowl)	.95
London broil w/mushroom gravy & 1 veg.		2.95
Broccoli quiche w/1 veg.		2.85
Keilbasa & sauerkraut		2.85
Hot deli: Baked ham	(bread)	2.65
	(roll)	2.75
	(hero)	2.85
Tuesday, October 27		
Ham & vegetable soup	(cup)	.75
	(bowl)	.95
Chicken cacciatore w/spaghetti		2.95
Baked fish w/parsley & lemon & 1 veg.		2.95
Spaghetti & clam sauce w/garlic toast		2.85
Hot deli: BBQ pork on a bun		2.75
Wednesday, October 28		
Lentil soup	(cup)	.75
	(bowl)	.95
Yankee pot roast w/gravy & 1 veg.		2.95
Eggplant Parmesan w/garlic toast		2.85
Chicken chow mein over rice		2.85
Hot deli: Roast turkey	(bread)	2.65
	(roll)	2.75
	(hero)	2.85
Thursday, October 29		
Cream of potato soup	(cup)	.75
	(bowl)	.95
Veal Madeline w/1 veg.		2.95
Fried fish almandine w/1 veg.		2.85
Chef salad plate (lite-weight)		2.25
Hot deli: Italian meatball sandwich		2.85
Friday, October 30		
Deluxe Manhattan clam chowder	(cup)	.75
	(bowl)	.95
Roast loin of pork w/apple sauce & 1 veg.		2.95
Fried fish & chips		2.85
Spanish rice & beans		2.85
Hot deli: Grilled cheese		2.65

CREF Values

January	$33.54	February	$34.99
March	$36.02	April	$36.02
May	$36.03	June	$37.74
July	$39.33	August	$40.94

September $40.06

Arrivals & Departures

Arrivals

Anthony Caracappa ..... Physics
Samir K. Dutt ..... NSLS
Andrew J. Jaisle ..... Accel. Dev.
Peter M. Leahy Jr. ..... AGS
Domenick J. Milidantri .... Accel. Dev.
Alain R.E.G. Plenevaux ... Chemistry
Curtis Scott Reeve ..... Accel. Dev.
William O. Themann ..... Accel. Dev.
Thomas R. VanWinckel .... Accel. Dev.

Departures

This list includes all employees who have terminated from the Laboratory, including retirees:

John J. Austen ..... Supply & Mat'l.
Ulrich W. Heinz ..... Physics
Joseph G. Murray ..... Plant Eng.
William L. Sherry ..... Budget
Grace A. Volkmann ..... Personnel

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 and/or appropriate bargaining unit, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants. In keeping with the Affirmative Action plan, selection decisions are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

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.

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 Employment Manager, Ext. 2882.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

2705. CLERICAL POSITION (part-time) - Requires good knowledge of office practices. Familiarity with word processing and IBM/PC helpful. Duties to include distribution of mail, typing and telephones. Budget Office.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2706. SECRETARIAL POSITION - Requires AAS in secretarial science or equivalent experience. Will perform diverse secretarial duties including typing correspondence and technical reports on word processor and making travel arrangements. Experience on MICOM word processor and IBM/PC desirable. Must have DOE security clearance. Department of Nuclear Energy.

2707. CLERICAL POSITION - Requires excellent interpersonal skills and previous receptionist experience. Duties will include heavy telephone work, mail distribution and light typing. Accelerator Development Department.

2708. SCIENTIFIC ASSOCIATE POSITION - Requires BS in biology, including coursework in cytogenetics or equivalent experience. Duties include working with laboratory animals, including maintenance and autopsy and organization and analysis of data. Experience with light microscope, preparation of reagents and preparation of common lab equipment necessary. Computer experience desirable. May require some after-hours work. (Term position until 9/30/88). Medical Department.

2709. ENGINEERING POSITIONS (2) - Requires BS in mechanical engineering or related field and a working background in fluid flow and heat transfer calculations. Experience in design and fabrication of piping and piping supports and high vacuum systems is very desirable. Duties will include varied work on mechanical systems, including design and equipment, supervision of system installation and overview of operation. Accelerator Development Department.

2710. ENGINEERING POSITION - Requires BS/MSEE and a minimum of five years' experience in the design, testing and implementation of analog and digital instrumentation as related to cryogenic controls. Knowledge of microprocessor and process computer systems is desirable. Accelerator Development Department.

2711. ENGINEERING POSITION - Requires BSEE and five years' experience in the following areas: design of precision feedback and control systems for high power rectifiers and other industrial processes, including the use of digital electronics and computer systems interface. Familiarity with various applications of analog and digital components and design and analysis experience with both types of systems required. Accelerator Development Department.

2712. TECHNICAL POSITIONS - Requires AAS or equivalent in mechanical technology. Will fabricate, assemble and operate cryogenic systems. Experience in piping and mechanical assembly is desirable. Accelerator Development Department.

Motor Vehicles & Supplies

79 CHRYSLER LeBARON - 318, 4 dr. sedan, a/c, a/t, p/s, p/b, clean, $1,495; 75 Plymouth Valiant, 225, 4 dr. sedan, a/t, p/s, $595. 277-4091.

77 BUICK - V6, hatchback, passed inspection, $250; (2) 75 Fiats, many spare parts, $300. Bob, Ext. 5010 or 289-2986 eves.

78 FORD LTD - 8 cyl., a/c, p/s, p/b, black, $1,100; 80 Z Camaro, a/t, T-tops, full power, low mileage, $5,900. 737-1957.

79 OLDS CUTLASS - new transmission, dependable, $1,500 neg. 289-7921.

81 CHEVETTE - 4 dr., a/t, am/fm stereo w/cass., sunroof, 85k mi., $950 or best offer. Ext. 3569 or 286-9560 after 6 p.m.

79 THUNDERBIRD - black, p/s, p/b, p/w, a/c, am/fm, excel. cond., $1,500. Jerry, Ext. 7427 or 475-5591 after 5 p.m.

82 HONDA ACCORD LX - 5 speed, a/c, cruise, am/fm cass. Ext. 4095.

TIRES - 2, Dunlop, Gold Seal belted, P215/75B15, $40; 2, 15" Volvo rims. Bill, 929-6442 after 6 p.m.

80 RENAULT Le CAR - runs well, any reasonable offer. Ext. 2578 or 821-9836, leave message.

74 DODGE VAN - 8 cyl., low mileage, cloth int., brown/beige, fully equipped, excel. cond., $9,500 neg. Sivi, 727-8280.

78 JEEP WAGONEER - V8, 4 dr., 4WD, Quad Trac, p/s, p/b, p/w, a/c, digital stereo cass., cruise, hitch. Ernie, 588-4987.

85 CUTLASS SUPREME BROUGHAM - 8 cyl., 305, 2 dr., T-roof, 26k mi., loaded, mint cond., garaged. 722-4577.

79 CHEVY - 4 dr., 4 cyl., blue, runs well, damaged body, $100. Hong, Ext. 3915.

80 DATSUN 200SX - 5 speed, am/fm stereo, a/c, 87k mi. 654-0830 after 6:30 p.m.

85 PLYMOUTH DUSTER TURISMO - a/c, p/s, am/fm cass., charcoal grey, red int., 37k mi., orig. owner, $5,200 neg. 585-1656 after 1:30 p.m.

72 CHEVY NOVA - 6 cyl., a/t, p/s, 2 dr., runs well, $350. Paul, Ext. 4156.

84 CHRYSLER LASER - a/t, a/c, p/s, p/b, new tires, must see, excel. cond. Ext. 2446 or 924-1911 eves.

75 DODGE DART - blue w/white vinyl roof, good cond. 744-3736.

83 CAMARO - V6, very good cond. Eddie, 727-7666.

RIMS - 13", $5/each. Ext. 4267.

74 VOLVO - high mileage, engine replaced, runs well, reliable, $950. Torsten, Ext. 3817 or 878-1210.

85 PONTIAC FIERO - am/fm stereo, 5 speed, white, like new, 16k mi., $6,300. John, Ext. 3082 or 922-9150.

75 SPRINT - new tires, am/fm cass., good cond., very reliable, must see. Skip, 727-6369 after 5:30 p.m.

79 FORD FAIRMONT - 2 dr., am/fm, 4 cyl., very good cond., asking $1,500. Nestor, Ext. 3073.

80 PONTIAC SUNBIRD - 97k mi., good cond., very reliable, $1,500. Peter, Ext. 3734.

78 FIESTA - m/t, good mpg, reliable, $385; 77 Honda Civic, good for parts, $100. Ext. 3164 or 744-5954.

84 HONDA ATC 200X - trike rims, Carlisle tires, extras, runs well, just serviced, $850. Bob, 744-3289.

84 HONDA CIVIC - 4 dr. sedan, 5 speed, 36 mpg, runs well, clean, 74k mi. Tony, Ext. 2054 or 283-6409.

80 HONDA - hatchback, 4 speed, manual, good cond., $1,500. 744-5448.

78 CHEVY MONZA - $500; 75 Jeep Wagoneer, 4wd, $1,000. 874-3796.

82 CAMARO BERLINETTA - T-tops, p/s, p/b, p/w, a/c, am/fm stereo cass., 38k mi., $6,200. 924-8260 eves.

71 MACH I - partially restored, 302, p/s, p/b, radio, $900. 289-1242.

83 SUBARU DL - 2 dr. sedan, 5 speed, sunroof, stereo, mint, $3,800. 878-0544.

76 JEEP CHEROKEE - 4wd, p/s, 2 new tires, $750. 744-8790 after 6 p.m.

77 OLDS 98 REGENCY - loaded, excel. cond., orig. owner, $3,250. Ext. 3392 or 475-8330.

81 RELIANT WAGON - 4 cyl., a/t, new brakes, good cond., $1,850. Dick, Ext. 3273 or 588-5287 eves.

84 CHRYSLER LASER - a/t, a/c, p/s, p/b, new tires, must see, excel. cond. Ext. 2446 or 924-1911 eves.

74 IMPALA - 8 cyl., regular gas, reliable, $200. Ext. 3164 or 744-5954.

VETTER MOTORCYCLE FAIRING - Quicksilver, black w/gold pinstripe, frame mounted, full lighting, excel, $95. Henry, Ext. 5110.

84 MONTE CARLO CL - deluxe int., p/s, p/b, p/w, a/c, am/fm stereo cass., 35k mi., $7,500. 924-8260 eves.

69 PONTIAC LeMANS - 1971 V8 Pontiac engine, new front tires, runs. 924-6129.

77 MERCURY GRAND MARQUIS - 2 dr., 92k mi., garaged, very good cond., $1,600 neg. 744-2805.

75 DATSUN - good engine, 4 speed, glass, good for parts, best offer. 289-8212.

79 GRAN PRIX - 3 speed, am/fm cass., bucket seats, V6, 70k mi., excel. cond., $2,300. 751-4936.

78 FORD SUPERCAB PICKUP - 4 speed, 300 cu. in., tow pack., slotted wheels, more, excel. cond., $3,300. Artie, Ext. 4987 or 325-0743 after 5 p.m.

84 CHEVY TRUCK - 8 cyl., 12' enclosed box, hydraulic lift gate, a/c, p/s, p/b, 64k mi., $5,200. Ext. 4846 or 363-6940 after 5 p.m.

84 TOYOTA COROLLA - 4 dr., 5 speed, a/c, new tires, brakes, $3,800. Nancy or Jerry, 842-3516.

80 DODGE ASPEN - new tires, excel. cond., $1,200. Craig, Ext. 4028 or 938-7390 eves.

87 HONDA WAGON - 1500cc, 4 speed, some new parts, $600 or best offer. Tom, Ext. 3086.

83 DATSUN 210 - remanufactured engine, 12k mi., damaged body, warranty thru 8/89, $950. Ext. 7155.

73 PLYMOUTH SATELLITE - V8, new trans., just tuned, new tires, runs well, $900. 732-9474.

78 YAMAHA 400 - 14k mi., inspected, good cond., $400. 473-9223 after 5 p.m.

82 MERC CAPRI - needs engine work, good cond., asking $850. Dick, Ext. 4313 or 722-4094 after 6 p.m.

86 SUZUKI FA-50 SCOOTER - bright blue, excel. cond., $300. 821-0250.

Boats & Marine Supplies

30' DUTCH MAID - 1956, sloop, in commission, hull needs work, $1,000 or best offer. 475-9294.

34' SILVERTON - 1978, twin 270 Crusaders, 3kW generator, fresh-water cooled, sleeps 6, all glass, extras, $39,000. 878-4621.

27' BRISTOL - sloop, inboard diesel auxiliary, 5 sails, fully equipped, must sell. Kuper, 941-9423.

14' HOLDER SAILBOAT - 1983, blue multi-colored sails, mint, $2,200. 878-0544.

16' BOWRIDER - rebuilt 70 h.p., trailer, canvas, many extras, good cond., asking $2,200. Dan, Ext. 2075 or 737-8124.

Miscellaneous

GE ELECTRIC RANGE - 30", gold, very good cond., $75. 473-6546.

ATARI 130XE - Atari 1050 disk drive, like new. Ext. 3300 or 744-8823 eves.

TORO RIDING MOWER - 5 h.p., 25" cut, $300; self-propelled mower, $50; Westinghouse washing machine, $40. Ernie, 588-4987.

MOUTON LAMB FUR JACKET - size 14-16, excel. cond., $65. 475-1826 after 6 p.m.

SPINDLE ANTIQUE CHAIRS - 6; sulky for Gravely tractor, will trade or sell. 363-7032.

UNICEF XMAS CARDS - & gifts. Ext. 2022 around noon or 744-8386.

COUCH - & loveseat, 87", neutral print, contemporary, excel. cond., orig. $1,000 5 years ago, make offer. Roy, Ext. 2384 or 722-8736.

NYLON CARPET - 10'10"x11', orange print, like new, $75. Bill, 929-6442 after 6 p.m.

COAL STOVE - Surdiac model 520, good cond., $225; 2 storm windows, alum., 36"w x 39"h, $10/each. 567-9025 eves.

CANNING JARS - 6 dozen, $15; 3 cartons 1950's & up Popular Mechanix, Illustrated & Science books, $15; crib, $20. 878-6637.

RADIO CONTROLLED VAN - Lunch Box, fully assembled, $125. Joe, Ext. 7636 or 744-8790.

FUEL OIL TANK - 275 gallon capacity, good cond., $49. 924-3236.

KEROSENE STOVE - & 5 gallon can, $35; economy light fixtures, ceiling & wall, $5/each; bath scale, $5. 924-2726.

AREA RUGS - 2, 6'x10', rose w/grey border, 6 months old. 821-0865.

MOVING SALE - cars, bikes, lawn equipment, furniture, lamps, desks, much more 277-4091.

COMPUTER PRINTER BUFFER - for Commodore 64, Telesys turboprint, 32k, $70. Witkover, Ext. 4607 or 368-8018.

DINING ROOM SET - wood, lighted breakfront, 5 chairs, mint cond. 737-1957 after 5 p.m.

U-PICK PUMPKINS - weekends, 9 a.m.-6 p.m., Beaver Dam Rd., Brookhaven Hamlet.

LAWN MOWER - 3½ h.p. Tech. engine, 21" cut, good cond., $60. Dan, Ext. 4987 or 698-7322.

AQUARIUM - 10 gallon, w/filter, backdrop, extras, $10. Lois, Ext. 4904 or 929-4753.

REFRIGERATOR - 21 cu. ft., frost-free, $200; gas range, continuous clean, $75. Mike, Ext. 5035.

SEARS LEAF & LAWN VACUUM - good cond., $85. 281-2186.

APRICA FOLDING STROLLER - ideal for travel, wooden baby swing. Ady, Ext. 4531 or 331-3785.

MAN'S TRENCH COAT - Botany 500, 36 short, w/zip-out liner, like new, $35. Susan, Ext. 7235 or 395-3529.

NEWSDAY - November 21-26, 1963, $10; 12 volt Ford generator, $10; Murray 10-speed bike, $60. Frank Rumph, 588-3565.

CLOTHES - for infant girl, 24 mo.-3 yrs., dresses, pants, tops, jackets, coat, sleepers, shoes, blankets, mobile. Kelly, 744-3069.

DESK - 30"x60", wood-grain formica, executive, very good cond., $125. 728-9165.

MEN'S BICYCLE - 12-speed, $50; wallpaper, new, 5 rolls, $20. Susan, Ext. 4267.

FOSSIL FISH - citrine crystals & amethyst crystals from Brazil. Whitey, Ext. 2913.

PEAVEY PA SYSTEM - 2 cabinets w/4 10" speakers, 2 cabinets w/4 12" speakers, 160 watts, 8 inputs, good, $500. Jim, Ext. 3084.

TYPEWRITERS - 2, Smith Corona, electric, $35; manual, $20, both w/cases. Bob, Ext. 3509.

EBONY CHINA CLOSET - glass front, separate base, 60"w x 64"h, $150; pine dining room set w/6 chairs, 54" round, $150. 363-6845.

ELECTRIC BLANKET - like new, $10; air conditioner, used one season; 10 folding chairs, need paint, $5. 475-1254.

SEARS UPRIGHT VACUUM - 5.2 amperes, 2-speed, $25; girl's 16" Huffy bicycle, pink, $40; boy's Ross BMX bike, hand brakes, $75. 924-5419.

KEROSENE HEATER - 22,000 Btu, Sun-beam, excel. cond., $90. Ext. 2683 or 751-2469 eves.

DOORS - 2, screen/storm, cross buck-type, $10/each. 722-3338.

COPIER - two-stage, needs adjustment, $15. Ext. 4192.

SOFA - Ethan Allen, 4 cushions, orange; chair, Ethan Allen, gold. Ext. 2950.

POWERMATE GAS GENERATOR - 5 kV, brand-new, in box, $500. Joe, Ext. 7636 or 744-8790.

MOVIE CAMERA - Bolex Super 8, $20; movie light, $5; Olympia typewriter, $20; refrigerator, $40; desk, $30; lamp, $5; bookcase, $10. Pete, Ext. 4326.

FUR COAT - rabbit, full length, size 8, almost brand-new, $150. Marie, Ext. 3676.

SCHOOL DESKS - 1 wood top, 1 formica, $5/each. Ext. 4332.

KITCHEN TABLE - oval, butcher block, 4 wood chairs, good cond., $150. 4 stools, $40. Ext. 4457.

WHEELCHAIR - excel. cond., $200; piano, over 100 years old, great for beginner, $400. Bea, Ext. 3642.

GE STOVE - electric, 4 burners, 2 oven elements, $25. 727-4859.

CANNON COPY MACHINE - PC25, like new, $425. Tim, Ext. 3436 or 727-7741.

COUCH/LOVESEAT - velvet, w/wood trim, $100; table, $20; coffee table, $35; wooden étagère, $10; Oriental rug, 9x12, $25. 689-7259 after 6 p.m.

MONOCHROME MONITOR - for Tandy 1000 or any computer w/RCA pin jack/plug connector cable, $70. John, Ext. 3292 or 286-1348.

BASS AMPLIFIER - 140 watt acoustic, 2-15" speaker cabinet, $300; Aria Pro II bass guitar, black/gold, $350, both for $600. Jim, 878-4801.

TYPEWRITER - Smith & Corona, manual, very good cond., $45. Bill, 924-1346.

DRAPES - insulated, floor length, 10'W, gold brocade, $45; Bundy clarinet, $80; men's Schwinn 3-speed bike, $25; boy's bike, $10. Walt, Ext. 7154.

Yard Sales

YAPHANK - multi-family block sale, Oct. 24, Oct. 25-rain date, Rustic Rd. 924-4097.

ROCKY POINT - Oct. 24 & 30, 10 a.m.-4 p.m., 5 Grant Rd. Ext. 3423 or 821-3234.

Free

KITTENS - 7 weeks old, 2 pure white, 2 grey & black. 924-5192 after 5 p.m.

KITTEN - white, beautiful, very nice. 331-8921.

BLACK LABRADOR RETRIEVER - friendly, good watch dog. 878-1640.

Real Estate

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

For Sale

HILTON HEAD, SC - 3 bdrm. condo, sleeps 8, 2 baths, washer/dryer, wet bar, 6 tennis courts, 3 pools, golf, ocean view, asking $89,000, will rent. 929-8912.

RIDGE - 3 bdrm. L-ranch, bsmt., garage, ⅓ acre, fenced, sewers, city water, 4 miles north of Lab, $126,900. Marie, Ext. 7716 or 821-3556.

RIDGE - 2 bdrm. town house, 1½ baths, central air, 5 appli., immaculate, low maintenance, by owner, $92,000. 924-4781.

MIDDLE ISLAND - 3 bdrm. ranch, ½ acre, 4 appli., new burner/boiler, thermal windows, gutters & driveway, moving soon, must sell. Ext. 3086.

MONTAUK - Gurney's Inn, spa, timeshare, sleeps 4, lifetime vacation, 15th week Easter/Passover, $12,500. Ext. 3144 or 698-5046.

For Rent

BLUE POINT - 2 bdrm. house, l/r, new kit. & bath, d/r, w/d, central a/c, f/p, w/w, bsmt., fenced yard w/shed, ¼ mile to Nicolls Rd., 20 min. to Lab, $800/mo. +. Henry, Ext. 5110 or 399-3087.

HILTON HEAD, SC - sleeps 6, pool, beach, tennis, golf, winter rates, $300/wk. 585-9149.

CATSKILLS - 3 bdrm. chalet w/sleeping loft, fully furn., great for fall foliage, deer hunting & skiing, near Hunter & Windham Mtns. Judy or Kay, Ext. 3595 or Bea, Ext. 3642.

ROCKY POINT - 2 bdrms., oil heat, city water, big back yard, $600/mo. sublease, avail. Nov. 1. Jurg, Ext. 3423 or 821-3243.

MIDDLE ISLAND - 3 bdrms., 2 baths, eik, f/p, 2 story on wooded 2 acres, carport, avail. Nov. 15, $900/mo. Ext. 3675 or 924-3528.

SOUND BEACH - cozy 4 bdrm. cape/cottage, 1½ baths, 1 block to L.I. Sound, $750/mo. + util. 744-5930.

ROCKY POINT - 3 bdrm. ranch, l/r, kitchen, dinette, finished bsmt., avail. 12/15 for year-round rental, $800/mo. + util. Ext. 3434.

BELLPORT - furnished house, near bay, avail. Nov.-June 1988, single preferred, non-smoker, no pets, rent reasonable, + util., 286-9389 after 3:30 p.m. or 286-0466 after 5:30 p.m.

SOUND BEACH - 2 bdrm. ranch, full kit. & bath, f/p, bsmt., ¼ acre, near beach, 20 min. to Lab, no pets, $675/mo. + util. 1½ mo. sec. 821-0106.

MEDFORD - 2 room apt., new, spacious, eik, large l/r, priv. ent., w/w, cable, mature person, no pets, $550/mo. + 1 mo. sec., incl. all. 654-5411.

EAST PATCHOGUE - 1 bdrm. apt., priv. ent., patio w/grill, cable, all new, single person, $550/mo. incl. all. 654-0019.

On-Site Services

FRIENDLY BROOKHAVEN GULF SERVICE - Weekly special: tune-up & oil lube & filter, 4 cyl. $54.95; free battery & antifreeze check. Ext. 4034.

Wanted

TRAINS - Lionel, American Flyer, accessories, any cond., brings good price. Carole, Ext. 7100 or 924-4097 eves.

CHILD CARE - for 15 month old, Tue., Wed. & Thurs., 8:30 a.m.-5:00 p.m., on or off-site, your home. Bill, Ext. 2906 or 929-6189.

MINERALS - mineral collections & books, any language. Plotkin, Ext. 7974 on Wed. or 798-2887.

PARTNER - for sailing, joint owner for 30' sloop, Port Jeff slip. 473-2473.

SEAMSTRESS/TAILOR - to sew slipcover for club chair, materials provided. Sandy, Ext. 4550 or 281-0843.

MATH TUTOR - for 11th grader. Liz, Ext. 2346 or 286-8563.

FAMILIES - to join ski trip to Vail, Feb. 13-20. Ext. 7115 or 744-5801.

ARC WELDER - ac or ac/dc, 200 amperes. Gerry, Ext. 3672, Mon. & Thurs. mornings, or 663-2797 eves.

Classified Ad Policy Deadline is 4:30 p.m. Friday for publication Friday of the next week.