BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Innovative Approaches To Cancer Radiotherapy

So far, decades of international research have been powerless to overcome certain cancers, such as metastatic melanoma, which are generally fatal within a year. Yet now, recent strides in improved technology, both at Brookhaven and elsewhere, have refined neutron capture therapy to the point where clinical trials on this method for destroying tumors may soon begin on brain tumor patients in the U.S.

Earlier this month, 75 medical and scientific specialists from throughout the U.S. and the world came to BNL to discuss this progress and other related topics at a Neutron Capture Therapy Workshop. Held February 1-2, the workshop was organized by Senior Scientist Victor Bond and Scientist Ralph Fairchild, both of the Medical Department.

In neutron capture therapy, a boron-10 atom (or group of atoms) is attached to a biomolecule that, when injected into the patient, will travel straight to the tumor, transporting the boron with it. Partly because the boron carrier is especially attracted to tumors, and also because cancer cells are often extra-permeable to certain materials, the boron level in the tumor becomes higher than in the healthy cells around it.

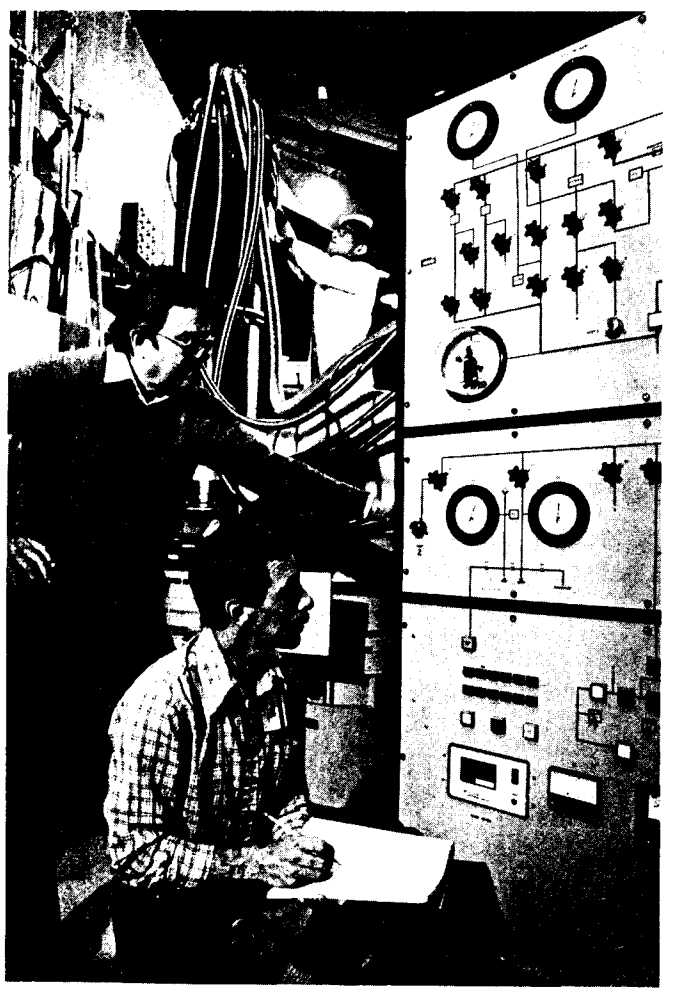
The boronated tumor is then targeted from outside the body by a neutron beam. Boron has a high affinity of neutrons and absorbs them, then "self-destructs" by splitting in two. The radiation that is released as this happens is intense enough to destroy the cancer cells containing it, but not the adjoining, healthy cells.

At the recent workshop, now that clinical trials are being contemplated, there were two major issues under discussion: First, is it best to deliver the radiation to the cells in one large dose, or in protracted fractionated doses? Second, which of the many boronated compounds now available should be used, and with which tumor?

Said Fairchild, "The consensus was that it would be most advantageous if neutron capture therapy were delivered in four to six fractions. Also, while present plans are to initiate clinical trials by treating glioblastoma with sulfhydryl boron hydrides, promising new compounds now being investigated intensively, such as boronated amino acids, porphyrins and monoclonal antibodies, may change the picture at any time." — Liz Seubert

Mort Rosen

During the last session of the Neutron Capture Therapy Workshop, (from left) workshop Co-chairmen Victor Bond and Ralph Fairchild, Medical Department, join the four workshop moderators: Sara Rockwell, Yale University; Börje Larsson, Uppsala University, Sweden; André Wambersie, Catholic University of Luvain, Belgium; and Ludwig Feinendegen, Institute of Medicine, KFA-Jülich, West Germany.



Mort Rosen

In the foreground, Franklin Langdon (left) and Robert Liegel, both of Physics, check the readings on the new dilution refrigerator. Behind them, Hiroaki Kadowaki of Tokyo's Institute of Solid State Physics adjusts the mixture of liquids in the cryostat of the machine.

Baby, It's Cold Inside!

Low-Temperature Physics Heats Up With New Refrigerator at HFBR

The latest research on low-temperature physics at BNL's High Flux Beam Reactor (HFBR) may result in hot news — thanks to the dilution refrigerator, a new device for chilling neutron scattering experiments down to six-thousandths of a degree above absolute zero.

"At this temperature, we're at a frontier of physics," said Guest Research Associate Gabriel Aeppli, AT&T Bell Labs, who is using the new refrigerator to investigate a heavy electron system in a joint venture with BNL and the Institute of Solid State Physics (ISSP), Tokyo. "It's about two orders of magnitude colder than what we had before, and at these extreme conditions, we should see new things happening."

Aeppli explained that, previously, neutron scattering experiments at BNL used a helium-3 refrigerator with a base temperature of four-tenths of a degree above absolute zero. "That's about the temperature at which one can start to see new phenomena, like nuclear spin ordering and heavy electron superconductivity," he said. "But just when it got interesting — we couldn't lower the temperature any further. That's why we had to get the new dilution refrigerator."

The new refrigerator was purchased from Oxford Instruments, England, under the technical supervision of Franklin Langdon, Senior Physics Associate with the Neutron Scattering Group in Physics. "We had a dilution refrigerator, nicknamed 'Big Blue,' that was built and operated at BNL in the 70's by Thomas Oversluizen and William Thomlinson [then both of Physics and now at the National Synchrotron Light Source]," recalled Langdon. "But its lowest temperature was 90 millikelvins — too high for our purpose."

"It takes a while to get them working," said Robert Liegel, a Senior Technical Specialist in Physics, who spent one year working on the new machine — assembling, callibrating and modifying it with special features for Brookhaven.

(Continued on page 2)

Conducting a Super Tour

BNL staff shared some of their wide-ranging experience with superconductivity on February 4, during a visit with members of the Coordinating Committee on Superconductivity R&D, Institute of Electrical and Electronic Engineers.

After receiving an update on high temperature superconductors from David Welch, Department of Applied Science, the eight-member group toured Accelerator Development Department (ADD) facilities, including the Power Transmission Project's test site and its cable winding facility, and the refrigeration plant for BNL's proposed Relativistic Heavy Ion Collider (RHIC).

The visitors also toured ADD's facilities for building superconducting magnets for both RHIC and the proposed national accelerator, the Superconducting Super Collider.

Here, Senior Project Engineer William Schneider (third from left), describes magnet assembly in Bldg. 905 to committee members (from left) Roosevelt Fernandez, Niagara Mohawk Power Corporation; David Sharma, Electric Power Research Institute; and Kenneth Klein, Director of Energy Storage & Distribution, Office of Conservation and Renewable Energy, Department of Energy.

Peter Horton

BNL Offers Outreach Program for Computer Beginners

"We started it to fulfill a need, and it's doing that job," said Earl Blanton, Assistant to the Director for Affirmative Action. He was describing the introductory computer course that the Lab's Affirmative Action Office (AAO) has run in Riverhead since 1985.

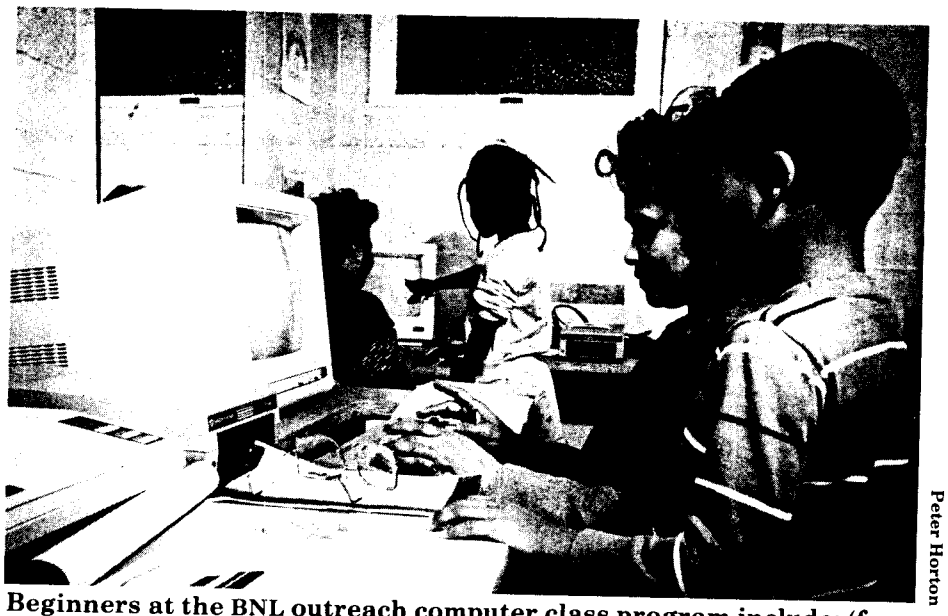
Originally intended for children, the program has now expanded to include six adults, who join the nine 7-to-15-year-olds at class on Wednesday evenings.

The course has been so successful that in 1986, Blanton was awarded the Dr. Martin Luther King Jr. Community Service Award by the First Baptist Church of Riverhead for his work. The same church also donated office furniture and allowed classes to be held in their basement. This offered a central position, besides providing security for the computer equipment on loan from BNL.

"We have 12 Commodores," said Frances Ligon, Administrative Assistant, AAO, who plans the program. Ligon is also one of the program initiators and taught many of the early classes. "When we first started, we had to take everything back and forth for each session. Now, we can leave it all in place. It makes a big difference."

"We have good assistance from other sources at the Lab," said Blanton, who now teaches most of the classes. "Ed Taylor [Applied Mathematics Department] set up equipment for us, and many of the participants in the Lab's Semester Student Program are very helpful.

"In fact," added Blanton, "we're doing fine. What we'd like now would be a personal computer to add more scope for our students. If anyone knows of a potential loaner, please call the AAO, Ext. 3318." — Liz Seubert



Peter Horton

Beginners at the BNL outreach computer class program include: (from left) Peggy Brown, Demetria Hopson, Mary Jane Saunders and Lynell Hopson.

Refrigerator (cont'd)

Said Liegel, "Basically, it works on the principle that below 0.86 kelvin, a mixture of liquid helium-3 and helium-4 spontaneously separates into two phases, one rich in concentrated helium-3 and the other rich in dilute helium-4. When the helium-3 migrates across the boundary between them, a cooling process similar to conventional evaporational cooling takes place. The final temperature of six millikelvins is a good bit lower than the 300 millikelvins that was the coldest we could get using our helium-3 refrigerator."

Two of the advantages of this refrigerator are that it has a unique, 360° access to neutrons, and it is completely stable at the 0.006 kelvin temperature, which makes experiments easily repeatable.

For several weeks before the first experiment, Hideki Yoshizawa, Guest Scientist, visiting BNL from the ISSP, had worked tirelessly with Liegel on the refrigerator — and on November 28, the machine became operative. Hiroaki Kadowaki, also a Visiting Scientist from ISSP, helped as well. Now, it's a matter of evaluating the results and performing follow-up experiments, which is expected to take about six months.

"We're investigating the heavy electron system in a compound made of one part cerium [a rare earth element] and six parts copper," said Aeppli. "At high temperatures, the electrons in this compound behave normally. But at very low temperatures, they behave as if they had 1,000 electron masses, which is a most unusual state. We think it may be because of magnetic fluctuations, which we can observe using the U.S./Japan instrument at the HFBR."

The dilution refrigerator has available a superconducting magnet producing a magnetic field of up to five teslas, which will also permit research at high fields at very low temperatures. Aeppli explained that these were the conditions for the discovery of the quantum Hall effect. This effect, for which Klaus von Klizten won the 1985 Nobel Prize in physics, makes it easier to measure fundamental constants and makes possible precise standards of electrical resistance.

— Liz Seubert

Theater Group: Meeting & Cast Call

The Theater Group will hold its next regular meeting on Wednesday, February 24, 8 p.m., in the North Room of the Brookhaven Center. The program will be readings from *Texas Trilogy*. Come at 7:30 for socializing. All are welcome.

Casting for the production of *The Foreigner* will be held on Monday and Tuesday, February 22 and 23, at 8 p.m., in Berkner Hall. Scripts are available from Robert Kinsey, Ext. 5096.

Bad Girls and Bold Boys

Ruth Bottigheimer will give a lecture entitled "Bettelheim's Witch: Roots of Culture," on Tuesday, February 23, in Room B, Berkner Hall. This evening meeting will commence at 5:15 p.m. with supper, which can be obtained through the line at the cafeteria, and the lecture will begin about 6 p.m. It is sponsored by Brookhaven Women in Science, and all are invited to attend.

Well known in the field of German literature, Bottigheimer takes interest in how national myths and fairy tales influence culture. In the title of her talk, she is referring to Bruno Bettelheim, the famous children's psychologist who wrote *Uses of Enchantment: The Meaning and Importance of Fairy Tales*, in which he interprets fairy tales and analyzes their influence on children.

In her lecture, Bottigheimer will take exception to the portrayal of women and girls in fairy tales and to Bettelheim's explication of their roles. She will present the message and impact of fairy tales on children from another point of view.

Ruth Bottigheimer

Bottigheimer is an adjunct assistant professor in the Department of Comparative Literature at the State University of New York at Stony Brook. Her most recent book on the subject of fairy tales is *Grimm's Bad Girls and Bold Boys: The Moral and Social Vision of the Tales*, published by Yale University Press last year.

S&SD Supervisors Earn New Certification

Peter Horton

The Department of Energy (DOE) now requires that all security supervisory personnel be certified by its Central Training Academy (CTA), Albuquerque, New Mexico. To satisfy this requirement, Kathleen Walker, Training Specialist, Safeguards & Security Division (S&SD), coordinated an intensive, five-day course on Supervisory Training for police officers. Most of the participants in the course, held at the Lab in January, were from S&SD. They were joined by attendees from other DOE sites as indicated. Attending were (back row, from left): Richard Rossetti; Philip Bence, West Valley Nuclear Services (WVNS); Rodney Nellis, WVNS; Thomas Gilbert; George Misson; Ernest White; Scott Senay, Bettis Atomic Power Laboratory; Tom de Simone; Leonard Butera; Keith Kemp, Argonne National Laboratory; (front, from left) Michael Delph; John Hunt; Harold Justice; Skip Bryant, Instructor, CTA; Richard Weber, Adjunct Faculty, CTA; Michel Montecalvo and Peter Garcia.

To Your Health

"Low Cholesterol Diets" will be the next Health Promotion Seminar topic, to be discussed on Tuesday, February 23, at noon, in Berkner Hall, Room B.

The speaker will be Martha McKittrick, a registered nurse and dietitian with Maxicare, one of the health maintenance organizations open to BNL employees. The talk is sponsored as a Health Promotion activity of the Occupational Medicine Clinic, and the Lab community is welcome.

McKittrick will begin her presentation with a video tape entitled "Understanding Cardiovascular Health." Afterwards, she will talk about the three dietary evils: cholesterol, fat and sodium, and the evil they can do within the body when consumed in excess.

She will outline strategies for decreasing their consumption, including tips for food shopping and dining out. Information packets will be handed out, which will include the American Heart Association's dietary cholesterol guidelines and low cholesterol recipes.

Camera Club

Photography classes for the coming year will be discussed at the next Camera Club meeting, on Thursday, February 25, at 5:30 p.m., in the Recreation Building. Beginning photography and darkroom work — both color and black and white — are some of the possible topics for upcoming classes.

Cooking Exchange

Recipes for hearty winter soups and breads will be demonstrated at the next meeting of the International Cooking Exchange Wednesday, February 24, from 12:30 p.m. to 2:30 p.m., in the Recreation Building in the apartment area on site.

Navy bean and bacon soup, fish stew and American chili will be featured. These traditional main-dish soups will be accompanied by cheese bread, corn bread and cinnamon bread. Such hearty recipes are sure to add warmth and variety to family meals. Come and enjoy these wholesome, cold-weather favorites with us.

All Brookhaven employees and their families are welcome. There will be a charge of $2 to help defray the cost of ingredients, and all those attending will be able to sample the dishes prepared. Babysitting will be provided at 50¢ per child.

Local Users Group

The next meeting of the Upton Local Users Group will be held on Wednesday, February 24, at 11 a.m., in Room B, Berkner Hall. At this meeting the Digital Equipment Corporation will give a presentation on software database products, RDB, TEAMDATA and RALLY (the entire VAX information architecture will be discussed).

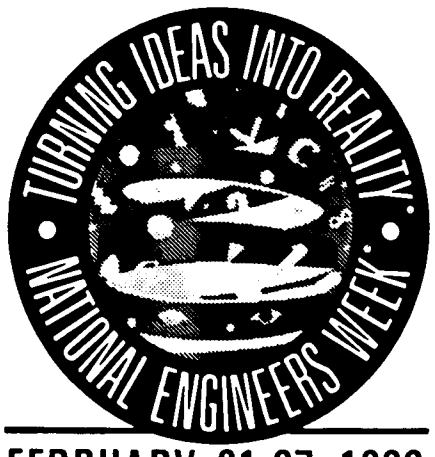
Time will be available for questions and answers after the presentation. All computer users are welcome to attend. For additional information, please call Zohreh Parsa, Ext. 4748.

Candidates Named For BERA Board

The BERA Nominating Committee has selected the following slate of candidates for the 1988 BERA Board Election: Robert A. Brown, Medical Department; Martin J. Leach, Department of Applied Science; Lawrence Musso, Safeguards & Security Division; and Jean D. Ramirez, Department of Nuclear Energy.

During the week of March 21 through March 25, eligible BERA members, including employees of BNL, AUI and DOE, and all other permanent on-site employees, will be invited to cast their ballots to elect two of the four candidates to serve on the BERA Executive Board.

More information on the candidates and the election will be published in a future issue of the Brookhaven Bulletin.



FEBRUARY 21-27, 1988

Pick a Student

Staff members are invited to review applications to select students to work under their supervision for the 1988 Summer Student and Summer Intern Programs, which will run from June 13 through August 19. Applications will be available for review in Room 2-107, Bldg. 490, Medical Department, from February 17 through March 1. Please enter through the main door and follow the signs.

Guidelines regarding selection of students have been distributed to research department offices. If interested, please contact your department coordinator.

Quartet to Perform Three Beethoven Quartets

For almost two decades, the New Zurich String Quartet has delighted audiences around the world with its masterful performances of a wide repertoire of chamber music. Now it's time for a Berkner audience to enjoy this group, when the quartet presents an all-Beethoven concert in Berkner Hall, on Wednesday, February 24, beginning at 8:30 p.m.

For their Berkner concert, the ensemble will perform three quartets by Ludwig van Beethoven — Opus 18, No. 6; Opus 59, No. 3; and Opus 132. Each quartet is representative of distinct periods in Beethoven's music.

Published in 1801, the set of six string quartets in Opus 18 were Beethoven's first compositions in this medium. These quartets grew out of the work of his predecessors, Joseph Haydn and Wolfgang Amadeus Mozart.

Four years later, when Beethoven began work on Opus 59, he had arrived at a more dramatic and forceful style. Works written in this middle period are projected on a much larger scale than before.

Beethoven's late quartets, including Opus 132, are his final musical testament and are said to contain the most personal music he ever wrote.

Tickets for the concert can be purchased at the door the night of the performance. Prices are $9 for general admission, $6 for students and those over age 65, and $5 for those under 18.

New Zurich String Quartet

Basketball

Games of February 11

First Game

Celtics 49		Hollywood 59	
J. Gaeta	16	E. Meier	17
O. Aliefendioglu	9	G. Mack	11
M. Fulkerson	7	D. Nordstrum	10
P. Ratzke	7	B. Kowalski	7
A. Ratti	4	B. Turner	6
R. Mease	3	E. Taylor	4
C. Edwards	2	B. Gunther	4
M. Colon	1		

Three Point Shots: Aliefendioglu, Fulkerson, Gaeta (2), Kowalski, Mease

Second Game

Penetrators 29		Longshots 35	
R. Domenech	8	T. Mayo	12
T. Comstock	7	M. Tardd	9
J. Cyr	6	F. Thompson	9
T. Abbott	4	F. Malone	5
R. Tonkyn	4		

Three Point Shots: Domenech (2), Thompson

Third Game

Runaways 58		Knicks 74	
G. Dunmore	16	Q. Harrison	24
P. Johnson	15	M. Lawrence	14
S. Gilbert	13	L. Walcott	13
J. Desmond	9	W. Cummings	13
G. Shepherd	3	T. Mendez	4
R. Jackson	2	G. Thompson	4
		T. McGill	2

Three Point Shots: Desmond, Dunmore (2), Gilbert, Harrison, Johnson

IBEW Meeting

Local 2230, IBEW, will hold its regular monthly meeting on Monday, February 22, 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.

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	October	$31.55
November	$29.30	December	$31.28

January $32.51

The Young and Talented To Star on Berkner Stage

From as far east as Easthampton and as far west as North Babylon, students will flock to Berkner Hall on Saturday, February 27, to participate in a Talent Show sponsored by the Afro-American Culture Club in celebration of Black History Month.

At 7 p.m., Master of Ceremonies George Grigg Jr. will begin introducing the first of the 32 scheduled acts. Entrants ranging from six to 18 years of age will share such talents as singing, jazz and tap dancing, classical piano playing and reciting their original poetry. Acts will be judged for their originality, poise and execution, showmanship and appearance. The top three will receive monetary awards, and all performers will receive certificates of participation.

The Talent Show is being coordinated by Grigg, with assistance from Arthur Anderson III, April Donegain, Mary Durham and Betty Sylvester, BNL; and Vernetta Cousins, Chaplin, Little Flower Children's Service. The performers they have recruited in the four auditions held since January represent a multi-ethnic cross section of talent from schools, community groups and churches throughout Suffolk County.

AACC President Bruce Penn urges everyone to come and enjoy the show. "We hear so many negative things about what young people are doing," he said. "Let's have a good turnout to encourage the positive."

All tickets are $3 and may be purchased in advance from: April Donegain, Ext. 2459; Mary Durham, Ext. 7143; Frances Ligon, Ext. 3709; Bruce Penn, Ext. 7213; or Public Affairs, Ext. 2345.

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They'll Be Singing the Blues — And All That Jazz!

Doug "Harmonica" McLean will be one of the headliners in Berkner Hall tomorrow night, when the Afro-American Culture Club presents a Black History Month treat — a Jazz & Blues Experience — beginning at 7:30 p.m.

As he plays his innovative and sensitive acoustic harmonica, and his intense, wailing, electrified blues harp, McLean will be accompanied by his five-piece Blues Band.

Also on the program for February 20 is Gwen Cleveland, vocalist with the Arts-in-Education Program of the International Art of Jazz (IAJ). Performing with her will be an ensemble of five musicians from the IAJ, a jazz-promotion group based at the State University of New York at Stony Brook.

Completing tomorrow's bill will be the MJBs, featuring Bill Sells on drums, Jean Sells doing vocals, Margaret Fonville on piano, Ray Williams on bass, and Paul Kendall playing a variety of wind instruments.

Advance tickets to a Jazz & Blues Experience are $8 for adults, $5 for children. If purchased at the door, tickets will be $10 for adults, $7 for children.

To purchase advance tickets, contact April Donegain, Ext. 2459; Mary Durham, Ext. 7143; Frances Ligon, Ext. 3709; Bruce Penn, Ext. 7213; or Public Affairs, Ext. 2345.

Doug "Harmonica" McLean

Volleyball

Standings as of February 8

League I		League II	
Upfagrabs	34-5	Nuts & Bolts	24-9
Dinkers	29-10	Set-Ups	22-11
Xrayted	23-16	Chunga's Revenge	20-13
Phoubars	15-24	Fossils	20-16
Cannonballs	11-28	Slammers	17-16
Bumpers	5-34	Upton Ups	8-25
		Photons	6-27

League III		Open League	
Sourcerers	26-10	Dakota	26-4
Printouts	25-11	Phoenix	24-6
Spikes	22-14	Serendipity	24-9
Screwballs	19-17	Not Too Bad	15-18
Renegades	18-18	Rowdy Radicals	8-22
MISfits	17-19	Duituits	6-24
Airheads	10-26	Leftovers	5-25
Good Times	7-29		

Bowling

Pink League

Maryann Reynolds bowled a 202/178/203/573 scratch, Sandy Asselta 175, Diane Davis converted the 3/4/7, Renie Rosati 4/7/10.

Purple League

Ed Meier had games of 212/211, Carl Murray 206, Gene Hassell 201, Mary Addessi 181.

Red/Green League

R. Jansson rolled a 233, N. Parrinello 232/229/652 scratch, W. Kristiansen 224, N. Combatti 217, H. Arnesen 214/208, J. Mayeski 212, L. Jacobson 209/201, K. Riker 207, K. Asselta 201.

Arrivals & Departures

Arrivals

Ramesh C. Budhani ..... DAS
Christopher J. Hanley ..... Plant Eng.

Departures

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

Rolf H. Beuttenmuller ..... Physics
Michael J. Buckheit ..... Sfgrds. & Sec.

Correction

In the concrete comparisons chart accompanying the story on insulating polymer concrete, the label "max. load/cubic foot" should have been "max. load/square inch."

Note to Diners

The cafeteria will be closed on Saturday, February 20. On that day, snack bar service will be available from 9 a.m. to 2 p.m. at the Brookhaven Center.

Cafeteria Menu

Week of February 22

Monday, February 22

Tomato rice soup	(cup)	.75
	(bowl)	.95
Sliced London broil w/gravy & 1 veg.		3.05
Chicken patty parmigiana & 1 veg.		2.85
Chef's salad plate (lite-weight)		2.25
Hot deli: Baked ham	(bread)	2.75
	(roll)	2.85
	(hero)	2.95

Tuesday, February 23

Ham & vegetable soup	(cup)	.75
	(bowl)	.95
Crusty herb-fried chicken w/1 veg.		2.95
Fresh baked fish w/parsley & lemon & 1 veg (lite-weight)		2.95
Hot deli: BBQ pork on bun		2.85

Wednesday, February 24

Lentil soup	(cup)	.75
	(bowl)	.95
Country-fried steak w/gravy & 1 veg.		2.95
Eggplant parmigiana w/1 veg.		2.85
Stuffed tomato cold plate (lite-weight)		2.25
Hot deli: Sliced turkey breast	(bread)	2.75
	(roll)	2.85
	(hero)	2.95

Thursday, February 25

Navy bean soup	(cup)	.75
	(bowl)	.95
Veal Madeline over noodles		2.95
Spaghetti w/white or red clam sauce & garlic toast (lite-weight)		2.85
Hot deli: Corned beef	(bread)	2.75
	(roll)	2.85
	(hero)	2.95

Friday, February 26

Manhattan clam chowder	(cup)	.75
	(bowl)	.95
Roast loin of pork w/1 veg.		3.05
Batter-fried fish & chips		2.95
Seasonal fresh fruit plate		2.25
Hot deli: Pastrami	(bread)	2.75
	(roll)	2.85
	(hero)	2.95

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.

2797. SECRETARIAL POSITION - Requires AAS in secretarial science or equivalent experience, and a thorough knowledge of Laboratory policies and procedures. Will provide varied secretarial support to division manager. Responsibilities will include scheduling appointments, typing correspondence on MICOM word processor, and maintaining division timecards and files. Additional duties will include data entry for MIS Project Monitor System and mail distribution. Management Information Systems Division.

2798. TOOL AND INSTRUMENT MAKER - (3 positions) Central Shops Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2799. MANAGER, POLICE GROUP - Requires a bachelor's degree or its equivalent in security management with a master's degree a plus, and a broad background in various safeguards and security functions. These functions are to include nuclear security, protective force training and exercises, tactical planning and execution and emergency management of security forces. Requires a minimum of 5 years managing a major safeguards and security operation and considerable skill in supervising large numbers of people and effectively dealing with upper management. Must have excellent skills in oral and written communications and decision-making. Responsibilities will include planning, organizing, managing and directing the activities of the Police Group. Ability to obtain and maintain a DOE "Q" clearance required. Safeguards and Security Division.

Motor Vehicles & Supplies

77 DODGE - $200; 74 Toyota Celica parts, $100. 928-5230 or 744-2203 after 6 p.m.

81 DATSUN B-210 - hatchback, 1.4L, 5 speed, a/c, new tires, exhaust & brakes, $1,600. 737-3327.

82 CAMARO - 4 cyl., am/fm, a/t, a/c, p/s, p/b, cruise, good cond., asking $3,800. 395-4272.

74 FORD - a/t, p/s, p/b, runs well, $250. Norman, Ext. 3354 or 472-3985.

81 DODGE OMNI - p/s, p/b, am/fm cass., a/t, a/c, $1,500; 78 Chevy Monza, hatchback, 4 speed, needs minor work, $350. 874-3796.

68 CAMARO - parts, doors; truck interior, many parts. Steve, Ext. 2310 or 929-6877.

77 AUDI FOX - a/c, radials, 85k mi., excel. running cond., $1,150. Al, Ext. 4442 or 929-8411.

81 OLDS OMEGA - p/s, p/b, a/t, a/c, new brakes, $1,200. Ext. 7795 or 589-8331.

82 DATSUN 200SX - 5 speed, a/c, loaded, 99k mi., excel. cond., asking $2,800. John, Ext. 7770 or 4480.

77 PEUGEOT 604 SEDAN - rare, p/s, p/b, p/w, sunroof, new parts, needs some work. Dave, Ext. 3653 or 878-8541.

TIRES - Firestone 235/75R15 M&S, 50% tread, $60/pr.; 6 bolt, GM wheels, free. Dave, Ext. 5454 or 475-2626.

77 CAMARO - for parts, engine runs, $60. 821-0250.

86 CAMARO - red w/black interior, V6, 44k mi., Kenwood stereo system, loaded, $7,500. John, 727-3673.

81 DODGE OMNI 024 - p/s, p/b, a/t, a/c, am/fm cass., new tires, muffler, etc., $1,500; 78 Chevy Monza, 4 speed, am/fm cass., $350 neg. 874-3796.

77 HONDA ACCORD - hatchback, a/t, a/c, am/fm radio, new brakes, exhaust, good tires, excel. in/out, runs well. 758-5592 eves.

70 MUSTANG 250 - V6, a/t, 16k mi. on rebuilt engine, runs well, best offer. 735-7940 after 6 p.m.

77 SUBARU - good winter car, front wheel drive, new alternator, rebuilt carb., brakes, $550. Ext. 4142 or 345-3915.

75 PLYMOUTH VALIANT - runs well, many critical parts are new, $500. Susanna, Ext. 3959.

86 CAMARO - blue, am/fm, tilt, a/c, many extras, low mi., $8,000 firm. J. Reddy, Ext. 5142 or 924-0441.

68 FORD MUSTANG 302 - V8, auto, new trans., dual exhaust, p/s, clean in/out, $2,000. Eric, 286-3403.

81 JEEP WAGONEER - V8, 4 dr., p/s, p/b, p/w, a/c, $6,500. 475-3407.

84 FORD MUSTANG - 20th Anniversary Edition, 60k mi., p/s, p/b, a/c, am/fm/tape, T-top, alarm, $8,200. 363-6940 after 5 p.m.

71 JAG X56 - project car, $3,800 invested, best offer over $2,000. 758-4770 after 5:30 p.m.

85 FORD ESCORT - 4 speed, 54k mi., am/fm stereo. Ext. 2890 or 744-6224.

82 MONTE CARLO - a/t, p/s, p/b, a/c, 69k mi., very good cond., $3,300 or best offer. 584-6730 after 5 p.m.

77 BUICK SKYLARK - new tires, one dent, good running cond., $450. 399-0537 eves.

85 DODGE MITSUBISHI CONQUEST TURBO - 5 speed, low mi., $7,500 or best offer. Larry, 473-6585.

82 CHEVETTE L/S - 45k mi., damaged, many excel. parts, best offer over $300. Dave, 281-0062.

79 OLDS CUTLASS - new trans., exhaust, & brakes, a/c, am/fm cass., high mi., $800. Sally, 281-0206 after 6 p.m.

TIRES - 4 ea., 165R-13, all weather, on Datsun wheels, $75; some other sizes available. Ken, 289-8212.

86 MAZDA PICKUP - 13-2000 SE5, 5 speed, am/fm stereo, orig. owner, excel., $4,950. Ext. 2529 or 588-7989 eves.

83 NISSAN SENTRA - 46k mi., no rust, excel. cond. 369-1571, leave message after 5 p.m.

CYLINDER HEADS - reconditioned for VW Bug; Weber carb. & assorted studs, all for $100. Fred, Ext. 4407 or 4435.

80 PLYMOUTH HORIZON - m/t, 70k mi., good cond., $1,000. 286-3209 after 6 p.m.

FULL LINER - & brush guard for 1982 Toyota pickup. Pete, 475-0831.

78 AMC CONCORD WAGON - a/t, p/s, radio, 83k mi., good cond., $750. John, Ext. 4101 or 286-0918 eves.

86 MITSUBISHI TRUCK - 4x4, cap, camper insert, p/s, p/b, Jack, 399-3899 after 5 :30 p.m.

86 SUZUKI SCOOTER - excel. cond., $300. 821-0250.

74 CHEVY NOVA - 3 speed, needs clutch, good cond., $100 firm. David, 369-9755.

Boats & Marine Supplies

22' SEAFARER SAILBOAT - 1974, 3 sails, Volvo outboard, full keel, asking $4,000. Fred, Ext. 4407/4435 or 499-1214.

21' MARQUIS - 1978, I/O, gal. trailer, complete package, $4,000 takes all. Vic or Tony, Ext. 3357 or 348-3518.

12' SAILBOAT - high freeboard, needs only minor work. 744-6059.

22' MARATHON WEEKENDER - 1986, 170 h.p., Mercruiser, Shoreline trailer, stand-up head, full galley, extras, $16,500. Ext. 3341 or 981-9474.

Miscellaneous

KITCHEN TABLE - 41" dia., 4 chairs, leaf incl., maple wood w/formica top, $40. 325-1797 eves.

COFFEE TABLE - $20; traveling cosmetic case, $20; baby crib, blonde wood, $50. 744-2203 or 928-5230 after 6 p.m.

DINING ROOM FURNITURE - 108" table, 6 chairs, 61" china, buffet, full padding, $995; china closet, mahogany, $295. 878-0175.

UPRIGHT FREEZER - excel. cond. $50. 281-9412 after 6 p.m.

BED - Sealy Posturepetic, queen-size, perfect cond., $250; bureau, chest, end tables, modern, $350. Ext. 2493.

INFANT'S CHANGING TABLE - $25; Graco walker, $20, both very good cond. Tom, Ext. 4819.

ART SET - starter, complete w/instructions, never used, orig. $90, now $60. 286-1097.

PUPPIES - Golden Retriever, AKC, excel. temperament, field champion stock, vet checked, shots, $300. 286-1024 after 6 p.m.

WASHER - Kenmore, 70 series, heavy duty plus, very good cond., $195. John, Ext. 2710 or 331-7350.

TANDY 1000 COMPUTER - DMP 130 printer, color monitor, two 5¼" disk drives, 384K memory, $800. Ed, 878-1200 days or 286-0654 eves.

EXERCISE BICYCLE - Sears, orig. $100, asking $35 . Ext. 4153 or 732-5829.

WALK/RUN TREADMILL EXERCISER - good cond., you pick up, orig. $280, asking $100. G.T., Ext. 2198 or 744-4662.

CENTER TABLE - glass top, decorative, $60; 2 side tables, $15/ea., all for $75. Ramesh, Ext. 4805 or 924-8113.

CAPTAIN'S BED - w/matching 5-drawer, 2-shelf dresser, excel. cond., $175. 473-8750 eves.

OPERA TICKETS - (2) at the Met, *Turandot*, Sat., March 5. 821-1435 eves.

SKYLIGHT VENTING - 45"x45", 1½ yr. old, w/screen, $100; two 20'x40' tarps, $30/both; bifold doors; large paper cutter. 751-8240 eves.

SOFA - 4 cushions, antique white, excel. cond., $350. 475-4394.

BUREAU - old, painted, $15; sled, $3.50; large round heavy table, not antique, $15; blender, $5. 878-6637.

GOLD LEAF STAMP REPLICAS - w/ first day of issue stamps, 2 handsome albums. Ext. 3846 or 4493.

WATERBED - queen-size, large headboard, w/mirror & shelves, $200. 874-2386.

PLAYPEN - high chair, car seat, bath, $90/all; blender, icebox, camping stove, low prices. Ext. 3134 or 2645.

FIREPLACE - free standing, black, open front w/screen, $75. Bert, Ext. 2050.

SILVERWARE - half-price sale, 72 piece, William A. Rogers, silverplate, mahogany chest, excel. cond., $125/all. Ext. 2529 or 588-7989.

IBM SOFTWARE - Popup calendar/alarm clock, $10; Apple MacIntosh software, Basic, $50. Susan, Ext. 4267.

MICROWAVE CART - excel. cond., $45. Karen, Ext. 4262.

WORK BENCH CHAIR - adjustable height, excel. cond., $25. 744-5871 after 6 p.m.

TV - color, RCA, 19", good cond., $90. Aoki, Ext. 3748 or 3176.

WALL MIRROR - gorgeous, old fashioned, etched, 52"x26", excel. cond., $50. Ruth, 744-5077.

TOOLS - old, kitchen utensils, aluminum cook & bakeware, 25¢ to $1. Ext. 2529 or 588-7989 eves.

BICYCLE FRAME - Connondale, 56 cm, w/campy headset, front derailleur, like new. Ext. 4023 or 325-9580.

TEAK DINING ROOM SET - 7 pieces, tiled buffet, rolling bar, like new, asking $1,950. Al, Ext. 4442 or 929-8411.

SCREENS & STORM WINDOWS - wood, 14 each, good cond., $50. Ext. 3794.

SKI BOOTS - Nordica rear entry, man's size U.S. 10, used one season, $45. Richie, Ext. 2175 or 734-7342.

FREEZER - Frigidaire, 8.3 cu. ft., still under warranty, $75. 751-1401.

Free

WOOD CASES - 11"x3"x3", w/⅛" lead jackets. Edwards, Ext. 4027 or 3846.

FEMALE CAT - friendly, spayed, Tara needs home, owner unable to care for her. 286-1097.

ONE LB. COFFEE CANS - Charlie, Ext. 4758.

Car Pools

BOHEMIA/OAKDALE AREA - needs 2 more drivers for car pool. Frank, Ext. 2314.

STONY BROOK - join two person car pool from M-section. Jag, Ext. 5080 or Neal, Ext. 2060.

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 Rent

BELLPORT VILLAGE - 1 bdrm. cottage, walk to stores, no pets, non-smokers, ref. required, couple preferred. Ext. 2700 or 286-7539.

SOUND BEACH - 1 bdrm. apt., priv. ent. & drive, w/w, single non-smoker preferred, $500/mo. incl. all. 744-7007.

RIDGE - Strathmore, 2 bdrm. condo ranch, l/r, d/r, kitchen, full bath, avail. immed., $625/mo. + util. Debbie, Ext. 2517 or 924-3414.

CAPE MAY, NJ - fully applianced new home, sleeps 6, avail. weekly or wknds. 427-8850 eves.

RIDGE - attractive 3 bdrm. house, bsmt., garage, 5 min. to Lab, $850 + util. George, Ext. 2615.

SHIRLEY - new 1 bdrm. apt., ww, new appliances, mature working woman, non-smoker preferred, $575 incl. all. 281-1840 after 4 p.m.

BROOKHAVEN - S. Country Rd., 2 bdrm. cape, new kitchen w/new appliances, new bathrm., $925 + util. 286-0270.

SOUND BEACH - large studio, eik, l/r-bdrm. combo, full bath, close to Lab, avail. immed., $500/mo. + 40% util. & sec. Ext. 2671 or 744-3284 after 6 p.m.

SHIRLEY - studio apt., 10 min. from Lab, quiet area. Helen, 399-0969.

BROOKHAVEN HAMLET - 3 bdrm., eik, fenced yard, guiet area, no pets, $775 + util. Ext. 2333 after 3:30 p.m. or 281-3479 after 5 p.m.

HILTON HEAD, SC - 2 bdrm. condo, sleeps 6, beach, pool, golf, tennis, Feb. & March, $320/wk. 585-9149.

EAST SETAUKET - 3 bdrm. hi-ranch, l/r, d/r, 1½ baths, economical coal stove, avail. immed., $925/mo. + util. Ext. 3791 or 928-7154

For Sale

WINDHAM, NY - ski chalet, 3 large bdrms., sleeps 10, 2 baths, fp, all appliances. 744-9746 eves.

SHIRLEY - 8 rm. house, full bsmt., ½ acre, low taxes, good investment. 281-6099.

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

STONY BROOK - 4 bdrm. cape, quiet street, l/r w/fp, den, d/r, 2 baths, bsmt., office, $189,000 or rent for $1,075/mo. + util. 751-8240 eves.

PATCHOGUE - large 1 bdrm. co-op, 2nd floor, immaculate, w/w, appliances, new kitchen, many closets, a/c, balcony, near all, must see, $69,900. 472-0392 or 472-6922.

MILLER PLACE - North of 25A, 3 bdrm. custom ranch, entertainment area, l/r, family rm., custom fp, 24'x26', 2 car garage, finished bsmt., much more, $225,000. 282-3353 or 473-5786.

MANORVILLE - lovely 3 bdrm. ranch, garage, on quiet cul-de-sac, 1½ baths, mint cond., 1+ acre, immed. occupancy, excel. neighborhood, South Manor schools, $145,000. Ext. 5400 or 878-6098.

PALM COAST, FL - ¼ acre, Greenbelt, approx. 5 miles to ocean, 24 miles to Daytona, water & sewer util., great investment, $5k & take over payments, $142/mo. Tom Nolan, Ext. 5265 or 7160.

Wanted

PIANO - second-hand, small. Ext. 3035.

CONVERTIBLE COUCH - & upright piano in good cond. Janet, Ext. 2345 or 929-3910.

APARTMENT - responsible woman seeks clean, separate apt. in priv. home, non-smoker, no pets, mid-March occupancy. Ronni, Ext. 3389.

ALUMINUM "JOHN" BOAT - approx. 4'x12', light, complete, good cond. Ext. 3794.

STUDIO APARTMENT - full time BNL employee, part-time SUNY student, needs studio apt. near Stony Brook. Mike, 698-0152.

FILING CABINET - used, for church choir music. Ext. 2617 or 751-1149 after 6 p.m.

SAILBOAT SLIP - 30', 4' minimum water depth, priv. party, only East End, L.I. 758-9818.

HOUSE TO RENT - 3 bdrm., in SWR school district, for BNL physicist w/family. Ext. 3009 or 2707.

TABLE SAW - in good cond. Ed, Ext. 2700.

VACUUM CLEANER - cannister type, w/hose & attachments. Joe, Ext. 2898.

ROOM TO RENT - Ext. 2058.

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