BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

The Importance of Being Ernest

There are three kinds of high energy physicists: the theorists who predict phenomena, the experimentalists who test those predictions, and those who build the particle accelerators in which these tests take place.

BNL Senior Scientist Ernest Courant is one such "master builder" who first came to Brookhaven as a summer visitor from Cornell. That was in 1947, the Laboratory's first year, and Courant joined in the study that later resulted in the construction of the Cosmotron. Designed to reach energies of three billion electron volts (3 GeV), the Cosmotron was also the world's first accelerator to reach and exceed 1 GeV.

Courant found the lure of energies in the billions of electron volts to be so strong that he joined BNL's permanent staff the next year, to analyze the properties of proton orbits in the Cosmotron. "The idea of going to 3 GeV seemed very high, very fascinating and exciting," he recalled. "I was happy to be at the forefront of breaking new ground."

After the Cosmotron was commissioned in 1952, Courant tackled a critical problem then confronting accelerator technology. Reaching 3 GeV, the Cosmotron had opened new areas of research, and its sister accelerator, the 6 GeV Bevatron at Lawrence Berkeley Laboratory, was expected to produce even more radical new physics. But in order to reach energy regions twice as high as the Cosmotron, the Bevatron had to be more than twice as big, with five times as much magnet tonnage. Accelerator physicists had to find a way to increase energies without such disproportionate increases in the sizes of accelerators.

Such a problem was logically in Courant's domain, since any increase in energy is related to increased acceleration of particles in their orbits. In an attempt to solve the dilemma, Courant joined forces with physicists John Blewett, Hartland Snyder and Stan Livingston, the first head of the Accelerator Department.

During acceleration, particles orbit through the center apertures of magnets, which keep them on course by focusing them horizontally and vertically. The way magnets are arranged so as to guide the particles is called the lattice. In the Cosmotron, all the magnets faced outward, but, to achieve higher magnetic fields, Livingston suggested that in future accelerators these might be alternated, with some facing outward, some inward. Courant, however, questioned whether this lattice pattern might have a negative effect on horizontal stability.

Courant looked back on this situation in 1980, during the celebration honoring the 20th anniversary of Brookhaven's 30 GeV Alternating Gradient Synchrotron (AGS), when he said, "I did the calculation and found to my surprise that the focusing would be strengthened simultaneously for both vertical and horizontal motion....now one could make both kinds of focusing strong at the same time. Soon we tried to make the gradients stronger and saw that there was no theoretical limit — provided the alterations were made more frequent as the gradient went up. Thus it seemed that apertures could be made as small as one or two inches — against 8×24 inches in the Cosmotron, 12×48 in the Bevatron, and even bigger in higher energy machines, as we then imagined them. With these slimmer magnets, it seemed one could now afford to string them out over much bigger circles, and thus go to 30 or even 100 billion volts."

The notebook in which Courant did his calculations is now in the Smithsonian Institution (see "The Past"), because those calculations, and the group's subsequent work, forever changed accelerator technology. The AGS is only one of many accelerators which the "alternating gradient" or "strong" focusing principle has made possible. "It's at least one of the guiding principles for everything that has been done since then," Courant observed, "so I guess I've had an impact."

It is also the basis for the proposed Superconducting Super Collider (SSC), which would reach energies of 20 trillion electron volts (20,000 GeV) in each of its two beamlines. As part of a national effort, BNL is developing one of three magnet designs being considered for the SSC. Brookhaven's magnets will reach fields around 6.5 Tesla, and Courant is designing the lattice for them and exploring stability problems for the collider.

How does lattice design differ in a 20×20 TeV accelerator, as opposed to a 30 GeV machine? Said Courant, "For the SSC, it's basically the same thing that we were doing before, but to the very limit of how far it can go." Describing this work, Courant said, "Lattice people determine how many magnets are needed, and answer such questions as: Is it better to have a few long magnets or many short ones? How strong does one want to make the strong focusing? In every case, one has to look at the trade-offs between practical, theoretical and cost considerations, and then think of the right compromise. And anytime one of the major magnet parameters changes, the lattice has to be recalculated."

Courant uses particle tracking programs to computer-simulate particle behavior. "It's very difficult to do such computations because, in the real machine," Courant explained, "the particle has to survive for many, many hours, which means many millions of revolutions. With computer simulation, it's hard to trace their orbits for more than a few hundred. Even the most sophisticated computers don't have enough capacity and speed to answer all the questions we would like to ask. Computers are only tools. You need people to think."

Mort Rosen

Ernest Courant at the SSC magnet development area in Bldg. 902.

Although Courant concentrates on SSC problems, he still finds time for other projects, such as the lattice and orbit calculations he has done for the relativistic heavy ion collider which BNL is proposing to build in the tunnel constructed for CBA.

Courant has also worked on the orbit theory behind the operation of polarized protons that began at the AGS last month. He is also, "speculating somewhat on whether operation with polarized beams will be possible on higher energy machines, up to and maybe including the SSC."

Being an accelerator physicist is often a matter of speculating, of looking forward. But Courant also finds satisfaction in looking back over his 37 years of involvement with high energy accelerators. And above all, he said, "I guess there's nothing to beat the excitement of being part of the discovery of the alternating gradient focusing principle. That's the sort of thing that happens only once in a lifetime."

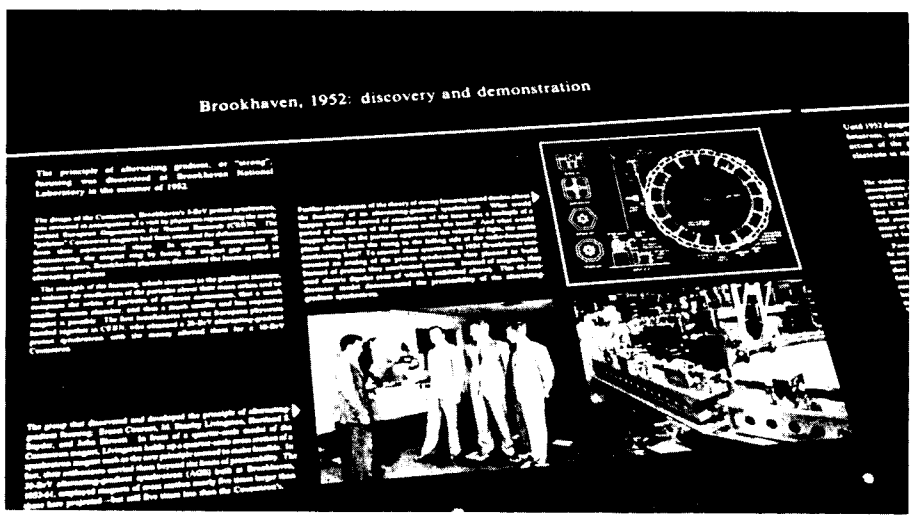
— Anita Cohen

The Past

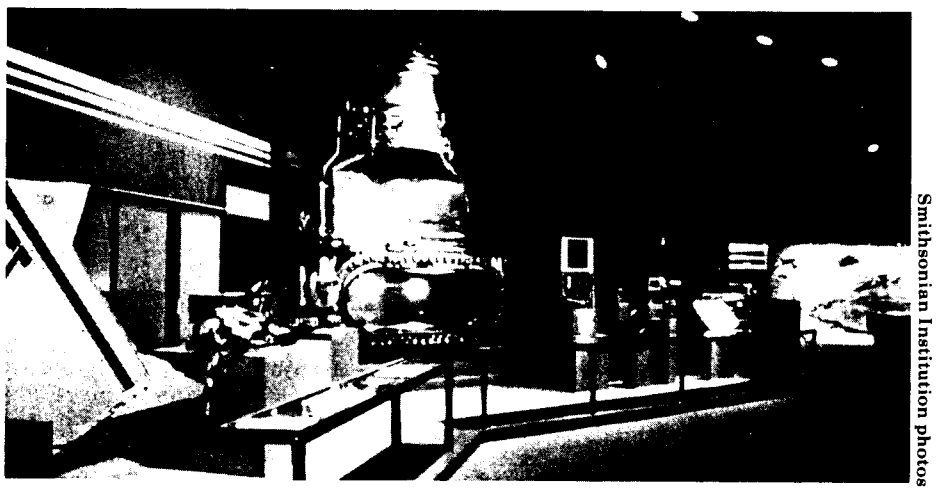
Many of us have visited the Smithsonian Institution in Washington, D.C. and admired the exhibits there, but few of us have seen our notebooks on display. Ernest Courant has, however. The notebook he kept while doing the calculations that resulted in the discovery of the "alternating gradient" or "strong" focusing principle is part of the Atom Smasher exhibit in the National Museum of History and Technology on the Smithsonian Mall.

Brookhaven is well-represented in the exhibit, which opened in 1977, tracing the then 50-year history of high energy accelerators. BNL came into existence only when this history reached its 20th year, but the Lab quickly became prominent in the field with the 3 GeV Cosmotron, the world's first proton synchrotron. The Cosmotron, the discovery of alternating gradient focusing and the AGS are the focal points of one display on proton synchrotrons.

At the center of a second display on particle tracking detectors is Brookhaven's 80-inch bubble chamber, where the Omega minus particle was discovered. And a more recent type of particle detector, a spark chamber from BNL, operates in a third display.



Part of the display on proton synchrotrons is shown here. At upper left, the 1952 discovery of the alternating gradient focusing principle is described. At right is a description of the electron analogue, a 45-foot model accelerator constructed at BNL in 1954 to demonstrate the principle. At bottom center is a photograph of the four men who co-discovered the principle at BNL: (from left) Ernest Courant, Stan Livingston, Hartland Snyder and John Blewett. Another part of the display focuses on Nicholas Christofilos, who discovered the principle independently, in Greece in 1950. At that time he was not taken seriously, but after the BNL discovery, his work was recognized as sharing the same basic principle. Subsequently, he came to Brookhaven and worked on the AGS project for several years.


Smithsonian Institution photos

The striking centerpiece in this display on the development of bubble chambers is Brookhaven's 80-inch chamber.

The Future

The importance of preparing a new generation to follow in the footsteps of accelerator physicists like Ernest Courant was recognized last year with the initiation of a special three-year program at BNL. Under this program, individuals with a Ph.D. degree and/or major training in the physical sciences or engineering may be offered appointments at the Laboratory as "Fellows in Accelerator Technology."

The specific objective of the program is to prepare scientists and engineers for careers in accelerator design and development. Towards this end, Fellows are expected to select the scope and nature of their investigations from among the general objectives of the Lab's accelerator physics program, which now include the upgrading of the AGS, magnet development for the SSC and the proposal for a relativistic heavy ion collider.

Since the program began in November 1983, four Fellows have received one-year appointments in the Accelerator Department. These appointments are renewable for a second year, after which each Fellow may be considered for appointment to the Laboratory staff, in competition with other candidates.

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 Ext. 5068.

DOE/NBM-1073
Vols. I & II
U.S. Statutes of General Interest to Safeguards and Security Officers. Vol. I Enforcement Provisions of Laws; Vol. II Text of Atomic Energy Act, Executive Orders and Other Laws. Prepared by J.J. Cadwell.

BNL-NCS-50496
ENDF-102
2nd Edition
Revised
ENDF-102 Data Formats and Procedures for the Evaluated Nuclear Data File, ENDF/B-V. B.A. Magurno.

NUREG/CR-3091
BNL-NUREG-51630
Vol. 3
Review of Waste Package Verification Tests. Semiannual Report Apr. 1983 - Sept. 1983. P. Soo, et al.

BNL-51707
Establishing the Acidification Chemistry Information Database (Acid). Progress Report for NAPAP Projects E1-8, E2-11. G.R. Hendrey, C.G. Hoogendyk, N.F. Gmur.

BNL-51709
The Brookhaven National Laboratory Coastal Meteorology Program, 1972 - 1983. G.S. Raynor, P. Michael, S. SethuRaman, R.M. Brown, J.V. Hayes.

NUREG-CR-3628
BNL/NUREG-51737
Probability Based Safety Checking of Nuclear Plant Structures. B. Ellingwood.

BNL-51744
A Research Agenda for Space Conditioning. Compiled by J.A. Andrews.

Sweet Honey in the Rock at Berkner

Sweet Honey in the Rock, an electrifying singing group, is coming to Berkner Hall on Saturday, September 15. The concert is at 8 p.m. and is open to the public.

The quintet is black and female and took its name from an old spiritual about a land so sweet that honey flows from the rocks. In the tradition of black Americans, the group sings unaccompanied, except for occasional use of a percussion instrument made from an African gourd. They use a full range of vocal possibilities — changing rhythms, switching leads, slurring, leaping and dancing through the octaves.

Based in Washington, D. C., Sweet Honey has sung across the country for nearly 10 years, and their program favors social comment and protest. They sing about the black experience, about being women and of problems common to the whole human family. Their theme is presented in a mix of musical forms — gospel, jazz, rhythm and blues, African roots songs and "field hollers." As the Los Angeles Times noted in a review, "The show provided a pertinent reminder of two timeless musical truths: The human voice is the most expressive of all musical instruments, and art can transcend entertainment and comment on the human condition."

Tickets are $10 and may be purchased from the BERA Sales Office in Berkner Hall, from any of the following, or, if space permits, at the door the night of the concert:

	Bldg.	Ext.
April Donegain	197	2903
Robert Mosley	99	2350
Kay Hunt	185	2882
Deidre Seymore	462	5037
Mac Thomas	318	2959
Sandra Green	535	4933
Frances Ligon	460	3709
Fred Nesbitt	527	4001

The concert is sponsored by the Afro-American Culture Club.

Canoeing with Quinby

Faith, hope, and love. Ingredients like these simply can't miss. They also took on a special meaning for Helen Quinby, as she named her 17-foot solo canoe just that.

"I figured that if I went anywhere in it," she says, "and I had that, I would be okay."

In two-man races, she can't bring the boat but she brings the ideals, along with a little something else — "It's knowing the waters and thinking about what you're doing, and not relying on brute strength alone."

In June and July, she participated in her first two canoe races, and fared exceptionally well. With different partners in five-mile contests on the Nissequogue river and in Peconic Bay, she finished third in a field of 60 and 27th of 100 entrants, respectively.

Quinby's almost immediate success is not surprising, however. She literally grew up on the water, spending summer vacations canoeing in Michigan while in high school, and has continued to live, work and play around it. She enjoys scuba diving, fishing (especially for bass), camping, is the president of the BNL Fly Tyers Club, and races sailboats with a crew twice a week at the Bellport yacht club. When camping or doing research upstate, she always brings her canoe. "I couldn't imagine not taking it," she says. Her previous job was as an oceanographer, and she currently works as a microbiologist in DAS.

Aside from racing in competition, Quinby finds that just cruising can be a very spiritual experience. "I can remember talking to my parents about the difference between a canoe and a motorboat," she says. "It's like walking down the street and driving down the street. You just experience the lake so much more...there's so much to hear and see and smell and feel."

On this particular morning, a light mist lingers in the air as she readies the boat for a test run at Southhaven Park. Across the lake, swans and ducks chatter amongst themselves while she steers away from the land. She uses a "pry and draw" stroke to move away, shifts to a "pitch" stroke to align the canoe, and switches to power strokes to pick up speed. Soon, the boat is cutting across the water, and she is on her way.

Just four years ago, Quinby's interest in the sport was given a boost. After spending the summer and fall in the Adirondacks working on an acid rain study, she purchased a 60-year-old wooden canoe that had been salvaged when the state took over some land, allowing it to be "forever wild." She named the boat Nehasane, after the estate on which it was found. After restoring it, she would bring the fifteen and one-half-foot, 100-pound canoe to the Adirondacks each time she went. "It was my time to play in the evenings," she says.

After she discovered the finer points of the sport, Quinby found that she could teach other women canoeing. In teaching, she stresses the importance of water safety, and advocates the use of lifejackets, a bailer and a spare paddle. She has found that many students are able to catch on very quickly, while others have difficulty with certain points. "Students often perceive that the paddle is moving through the water," she says, "when in fact it's the paddle that stays still and the canoe is moving."

Quinby owns four wood paddles. They all serve different purposes, and they're lightweight and are laminated to increase durability. They cost between $40 and $60 apiece, "so I treat them well," she says. "It's really worth it. When you go a long distance, and your paddle weighs ounces versus pounds, that makes all the difference in the world."

Roger Stoutenburg

Helen Quinby

In the near future, Quinby and her partners will pursue more races "to see how far we can go." In the meantime she enjoys taking the canoe out at least once a week for a quiet trip. One time, however, she couldn't resist setting a personal challenge for herself, and going out to meet it. She took Faith, Hope, and Love out for a 30-mile trip, completed it in one day, and camped overnight by herself. "It's exciting," she says, "to know that this old lady can still do it."

—Maurice A. DuBois

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BERNICE PETERSEN, Editor
MONA S. ROWE, Associate Editor
ANITA COHEN, Reporter
MARSHA BELFORD, Reporter

35 BROOKHAVEN AVE., UPTON, N.Y. 11973
Telephone (516)282-2345

Service Awards

The following employees received service awards during the month of August:

Thirty-Five Years

Frank J. Rumph ..... Physics

Thirty Years

Marilyn K. McKeown ..... Physics

Twenty-Five Years

Joseph Bauernfeind ..... Accelerator
Mary A. Hughes ..... Accelerator

Twenty Years

Harold Bartlett ..... Supply & Mater.
Robert H. Bergoffen ..... Reactor
Charles E. Botts ..... Plant Eng.
Michael Carroll II ..... S&E Svcs.
John R. Doscinski ..... Staff Services
Pierre Grand ..... Nuclear Energy
Darrel D. Joel ..... Medical
Ronald J. Nawrocky ..... Light Source
George A. Taylor ..... Applied Math

Ten Years

Patricia A. Aud ..... Applied Science
Frances C. Bernstein ..... Chemistry
Melville J. Bonanno ..... Plant Eng.
Maria C. DeNatale ..... Tech. Info.
Seymour Holtzman ..... Medical
George Maise ..... Nuclear Energy
Richard C. Melucci ..... Applied Science
Martine E. O'Connor ..... Medical
John E. Pepe ..... Applied Math
Ann W. Reisman ..... Applied Science
Maryann Reynolds ..... S&E Svcs.
Philip F. Rose ..... Nuclear Energy
Nicholas C. Satterley ..... Central Shops
John L. Usher ..... Nuclear Energy
Donald A. Warner ..... Chemistry

Nuc. Eng. Courses Cut

Polytechnic Institute of New York is in the process of suspending its nuclear engineering graduate program, including the extension courses at Brookhaven. Any persons who have not completed their program of courses should contact Glenn A. Price, Ext. 3336, as soon as possible, and submit the titles of uncompleted courses. This information will be forwarded to PINY to assist in an orderly closeout of the nuclear engineering program.

Bank Note

The Barclay Bank 24 card for automatic banking may be validated at the onsite branch during regular banking hours. The cards were distributed recently and, after validation, may be used at branches with automatic tellers. Locally, the Patchogue and Ronkonkoma branches are automated and Rocky Point is next in line.

Hospitality News

A guided tour of the Longwood Estate, which is located a few minutes from the Lab, will be sponsored by the Hospitality Committee on Tuesday, September 4. Those who are interested in going should meet at the Recreation Building, in the apartment area, at 9:30 a.m. Transportation for the tour will be provided.

Wives of employees, guests and visitors are welcome. Please come and bring the children. Babysitting will be available free of charge. Coffee, tea and danish will be served.

Labor Day Food Service

At the Cafeteria, the snack bar will be open from 9 a.m. to 2 p.m. daily on Saturday, Sunday and Monday, September 1, 2 and 3.

The Tap Room at the Brookhaven Center will be closed on Saturday and Sunday, reopening at 5 p.m. on Monday, September 3.

The Vended Food Service in Building 912 will be in operation throughout the Labor Day weekend.

Cafeteria Menu

Week Ending September 7

Monday, September 3
Snack Bar 9:00 a.m. — 2:00 p.m.

Tuesday, September 4

Potato bacon soup	(cup)	.65
	(bowl)	.85
Beef pot pie & 1 veg.		1.90
Turkey à la king over rice		1.95
Hot Deli: Italian sausage	(bread)	1.95
	(roll)	2.10

Wednesday, September 5

Cream of cauliflower soup	(cup)	.65
	(bowl)	.85
Fettucini Carbonara & 1 veg.		2.05
Fried chicken finger w/2 sauces & 1 veg.		1.90
Hot Deli: Corned beef	(bread)	1.90
	(roll)	2.05

Thursday, September 6

Navy bean soup	(cup)	.65
	(bowl)	.85
Sausage pizza & 1 veg.		2.00
Sauerbraten w/potato pancake		2.15
Hot Deli: Monte Cristo		2.00
Top your own cheese cake bar		.95

Friday, September 7

New England clam chowder	(cup)	.65
	(bowl)	.85
Stuffed fillet w/Newburg sauce & 1 veg.		1.95
Sweet & sour pork on rice pilaf		2.00
Hot Deli: Baked ham & Swiss	(bread)	1.95
	(roll)	2.10

Arrivals & Departures

Arrivals

William E. Gunther ..... DNE

Departures

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

Andrew T. Jesaitis ..... S&ES
Matthew J. Jesaitis ..... App. Math.
Melody D. Brown ..... S&EP

Area Musicians in Concert

The Belle Terre Chamber Players, an ensemble of area musicians, will present a concert at Berkner Hall on Friday, September 7, at 8:30 p.m. The concert is free and open to the public.

The Belle Terre Chamber Players is composed of a core group of four instrumentalists — Hao Huang, piano and harpsichord; Rachel Vetter Huang, violin; Charles Nath, clarinet; and Richard Savino, guitar and lute. Dedicated to the art of chamber music, the prizewinning performers bring to their musical collaboration not only international solo experience, but also a fine sense of balance and unity.

On their program will be Broken-Consort Pieces by Dowland, Trio in C Major by Vivaldi, Hungarian Dances by Brahms, Trio in A Major, Op. 16, by Kreutzer, Serenade in C Major, Op. 29, No. 4 by Neumann, Variations on "Eine Mädchen Oder Weibchen" by Beethoven-Carulli, and selections from L'Histoire du Soldat by Stravinsky.

BERA News

Roger Stoutenburgh

1984 TENNIS CHAMPS: (foreground) Mary Lou Abata - women's singles, women's doubles, mixed doubles; Christine Saitta - women's doubles; Naresh Bhagat - men's doubles, mixed doubles; (standing) Om Singh - men's doubles; and Steve Shapiro, men's singles.

Equipment Demo

Aviv Corporation will be exhibiting their products at Berkner Hall on Thursday, September 6, from 11 a.m. to 5 p.m. They will be demonstrating DEC digital equipment, Data General and Multibus based disk and tape controllers used for high speed real time data acquisition.

PC Users Meeting

The next meeting of the PC/ Workstation Group will be held on Tuesday, September 11, at 10:30 a.m. in the Applied Math Seminar Room. Arnie Peskin will speak on "Artificial Intelligence and LISP."

Golf

The sixth tournament of the BGA season will be held on Monday, September 10, at the West Sayville Suffolk County Golf Course. The tournament will be run as a two-player, pick your own partner, team scramble, with teams playing in flights based on the combined team handicap. Tee times may be obtained by contacting John Usher, Ext. 2096, Bldg. 130. Entry fees are $1 for BGA members and $2 for non-members. Those interested in playing in the tournament, but who are unable to find a partner, should contact Usher. Deadline for entering is noon, Thursday, September 6.

Forty-two golfers played at Middle Island in the fifth tournament. Winners were: Low gross, 18 holes; Flight A - Doug Sweely (83), Flight B - Bob Gallagher (91), and Flight C - Howard Vetter (100). Vetter also won the closest to the pin contest. Low net, 18 holes; Flight A - Ron Webster (75), Flight B - Joe Mayeski (66), and Flight C - Frank Lepera (75). John Millener won the long drive contest.

Softball

Games for week of August 20

League I
Blue Jays 4 — Phoubars 2
Six Pax 14 — Big Sticks 11
Ravens 12 — Ice Pops 11
Renames vs. Moles
No score reported
Makeup game:
Moles 15 — Ice Pops 12

League II
Lights Out 17 — Titans 3
Medical 14 — Random Errors 2
Faze II vs. Scram
Dirty Sox vs. Magnuts
No scores reported

League III
No Names 12 — The Source 10
Survivors 7 — Nads 3
Farm Team (won) — E-Z Riders (forfeit)

League IV
Turkeys 8 — Underalls 4
Mole-Esters 11 — TNT 10
Septembers vs. Kidz-R-Us
No score reported

League V
Mudville Sluggers 30 — Erasers 6
No Feedback 28 — Space Kadets 3
Who Cares 23 — Foul Ups 9

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. 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 Personnel Placement Supervisor, Ext. 2882.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

2102. MATERIAL HANDLER - Supply and Materiel Division.

2103. TOOL AND INSTRUMENT MAKER, GROUP LEADER - (Heavy Machine Shop) Central Shops Division.

2104. SECRETARIAL POSITION - (part-time) Requires excellent typing and communication skills. Will provide diverse clerical and word processing support to an NRC project. Safety and Environmental Protection Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2105. SENIOR STATIONARY ENGINEER - Requires demonstrated experience in the maintenance, repair and operation of high pressure boilers firing #6 fuel oil. Current stationary or marine engineer license is highly desirable. Plant Engineering Division.

Autos & Auto Supplies

82 DIRT BIKE - RM-125, excel., kidney belt, chest protector, Bell Moto III, new. O'Kula, Ext. 4167 or 722-4821.

79 CAMARO - auto., sunroof, am/fm cass. stereo, beautiful cond., must see. 325-1756.

71 CHEVY IMPALA - V8, a/c, p/s, p/b, good cond., $1,400. Ext. 2673 or 744-8632 after 5 p.m.

73 CADILLAC - Fleetwood Brougham, electric everything, excel. cond., prof. maintained, $1,000. 286-1205.

72 DUSTER PARTS - 6 cyl. eng., trans., right fender, right door, windshield. 727-3608.

74 HORNET - 74K mi., (4) new tires, brakes, battery, runs well, body rusted, $500. Ning, Ext. 5222.

74 GMC - 4x4 utility truck, alum. wheels, dual tanks, all new, must see, $6,000. 744-9892 after 6 p.m.

TIRES - (2) snows on rims, wht. walls, LR78-15 $50; FR78-14, wht. walls, fair, $5/ea. Tony, 269-9510 eves.

63 CHEVY II - for whatever, $50. George, 589-0819.

71 GHIA - semi-auto, recently rebuilt, new body, $2,700. Ext. 5294.

78 DATSUN 280Z - 2+2, p/b, a/c, stereo, louvers. Rick, 981-7906.

68 CHEVY PICKUP - 350, cap, 3 spd., Hurst floor shift, very good for parts. Ext. 5318 or 585-2084 after 6 p.m.

79 MERCURY BOBCAT - hatchback, auto., am/fm, a/c, p/b, p/s, excel. cond., $2,750. 567-4333 or 924-4965 eves.

78 DATSUN - F10 wagon, runs well, needs body work, $400. Ext. 4698 or 744-2097 eves.

67 SAAB - model 96, V4, front wheel drive, recent seats, muffler, new battery, $550. Ext. 4240 or 286-0295.

76 CHEVY NOVA - 69K mi., excel. mech. cond. Ext. 2073 or 928-8071.

72 CHRYSLER NEWPORT - reliable, $250. Donna, 722-4644.

SEARS BATTERY - 12 V, $15. Ext. 2675.

72 FORD TORINO - body good, engine needs work (302 cu. in.), $200 neg. 878-8964.

CROSS BED TOOL BOX - & set of bumpers for Chevy pick-up, $80. Jim, Ext. 4040 or 289-0876.

68 VW - runs, $175; 1969 VW parts, $75. Bill, Ext. 4938 or 728-1304 eves.

72 BUICK ELECTRA - 455 engine, runs well, looks terrible, $750. 246-8297.

78 COACHMAN CAMPER - 22', mint cond., 460 Ford engine, 21,000 mi., loaded, sleeps 6, MY-4-6346, $12,000. Ext. 2905.

73 VW SQUAREBACK - rebuilt engine, good transportation, $800. Ron, Ext. 2189 or 281-6630 after 5.

76 VW RABBIT - 4 dr., good cond. Ext. 2537 or 473-1658 after 6 p.m.

72 VOLVO - needs body work, asking $800. Eric, Ext. 2973 eves or 289-2352 days.

VESPA BRAVO MOPED - Super Deluxe, Class B, excel cond., used very little, $500. Lloyd, Ext. 3381 or 286-1024.

76 PLYMOUTH SPORT FURY - 2 dr., 318 engine, 70K mi., new muffler & pipes, clean, $1,350. Bob, Ext. 4782 or 821-0695.

71 CAMARO - 350, auto., louvers, spoiler, very clean body/interior, must sell, asking $1,300. 281-8426.

76 OLDS - 4 dr., white, low mi., V8, a/c, asking $2,500. Kevin, 567-6651.

78 MOTORCYCLE - KZ400, well maint. (by dealer), low mi., just tuned & serviced, very good cond., asking $800. 281-0360 after 6 p.m.

77 CHEVROLET CAPRICE - classic, 350 V8, 4 dr. sedan, Jensen stereo & tape deck, $2,900. 744-2783 a.m.

71 VW POP-TOP CAMPER - sleeps 3, all fixtures, new radials, battery, asking $1,200. Wanda, Ext. 3583 or 922-4865.

78 CADILLAC - 4 dr. sedan, D'Elegance model, 67,000 mi., excel. cond., full power, cruise control. Ext. 3319 or 744-9802.

RIMS - (4), white, 8-lug, with 12x16.5 tires, goood cond., must sell, $250. 744-3968 leave message.

78 MUSTANG - good cond., auto., 4 cyl., sunrooof, am/fm w/booster, spoke rims, blue. Regina, 283-3142.

74 CAPRI - good transportation, $600. J. Sanford, Ext. 3321 or 286-9611.

76 DATSUN PICKUP - w/cap, 4 spd., studded snows w/wheels, $1,200. Ext. 4798 or 929-4940.

RADIATOR - from 1978 Pontiac Grand Prix, make offer. 298-4155.

TURTLE TOP CARRIER - brand new, $75. Al, Ext. 2075.

72 VW BUG - roof rack, runs well, make offer. Russ, Ext. 3059 or 744-7242.

71 DODGE DART - 1318, 4 dr., p/b, p/s, a/c, excel. running cond., body fair, 127K, asking $750. Ext. 4935 or 928-5737 after 6 p.m.

68 PONTIAC TEMPEST - good cond., 50,000 orig. mi., $800. Ext. 3158 or 727-7075 eves.

72 DODGE SPORTSMAN VAN - 6 cyl., auto., p/s, p/b, all windows, seats 4, $1,500. Joe, Ext. 5233 or 369-0432.

70 NOVA - orig. owner, small V8, p/s, recent paint & improvements, runs well, $650. Ext. 4192 or 751-7787.

75 CORVETTE - excel. cond., white/beige int., p/s, p/b, a/c, p/w, T-tops, low mi., tilt wheel, am/fm. Roy, Ext. 4664 or 331-2401.

78 NOVA - V6, auto., p/s, p/b, a/c, am/fm cassette, new exhaust, low mi., clean, excel. cond., $2,350. Ext. 7759 or 3073 eves.

76 DATSUN 710 - 4 spd., am/fm radio, window defogger, trip odometer, very good cond., $1,600. Ext. 3565 or 924-8594.

78 HONDA MOTORCYCLE - CB550K, garaged, low mi., helmet inc., $850. 467-8563.

75 TOYOTA COROLLA - good cond., reliable trans., asking $1,200. 473-3070.

78 PLYMOUTH HORIZON - 4 dr., auto., $2,400. Debbie, 727-8764 before 7 p.m.

74 CHRYSLER NEWPORT - $450 or best offer. 727-5912.

82 HONDA - CB250, Custom, plexifairing, luggage rack, saddle bags, brand new cond., must sell, $990 firm. Ext. 4417 or 929-8748.

78 JEEP WAGONEER - auto., Quadra-Trac, 64K, V8, $3,700. Joe, Ext. 4139 or 467-2422.

71 VOLVO - 144S, new paint & tires. 472-4520.

Boats & Marine Supplies

5' JOHN DORY - fiberglass boat, w/steering, excel. cond., $500. Ext. 3604 or 878-0516 after 5:30 p.m.

18' WINNER - 1971 fbgls., i/o, FWC, 1/d trailer, 155 HP OMC, many extras, $3,200. 722-3905 after 5 p.m.

28' OWENS - very good cond., new canvas & hardtop, sleeps 4, stove, sink, ice box, stand-up head, equipped, asking $2,600. 281-0360 after 6 p.m.

13' AMF PUFFER SAILBOAT - hiking straps, large cockpit, main, jib, spinnaker, $800. Joe, Ext. 5233 or 369-0432 eves.

32-1/2' IRWIN - sloop, center cockpit, excel. cond., loaded, $33,000. Stan, 878-6670 days or 878-0528 eves.

OUTBOARD ENGINE - 1978 Mercury, 4.5 HP, long shaft, low hours, $350. Ext. 3833 or 587-8408.

WINDSURFER - 13' mast, brand new, $650. Rich, 744-9529 after 6.

Miscellaneous

MINI AUTO RACER - Budweiser, red fbgls. body, brand new, best offer. Joe, 744-1566.

PLANTERS - colonial spinning wheel, maple, 2 small, 1 large, $25. Nancy, Ext. 5274 or 281-2767 eves.

COLONIAL COUCH - matching chair, plaid, Herculon, mint cond., $200. 587-2625.

RCA TV - 12" black & white, needs work, $20; cot, $12. 744-9677.

STORM DOOR - aluminum, 32"x6'8", storms and screens, $30. Joe, Ext. 5233 or 369-0432 eves.

FUR JACKET - racoon, never worn, won in raffle, value $1,000, sell for $250. Tony, Ext. 2462 or 269-9510 eves.

OAK HALL TREE - 4 hooks, $10; mahogony hall tree, $20; lawn spreader, $10. 878-6637.

MAPLE TWIN BED - upholstered chairs w/slipcovers; Scotts spreader, model 75-3; oil drums, hanging lamp. 325-1961.

15" TV - black & white, 3 years old, $45. 924-8722.

LAWN THATCHER - power rake, Bluebird, excel. cond., $525. 289-0413.

LOVEBIRDS - (4) blue mask birds w/breeding cage, $250. 399-4480.

CAMARA SYSTEM - Pentax 110 w/winder, normal, tele, wide angle, flash, used once, $100. Bernd, Ext. 3405/3389.

TORO - 2 stage, 5 HP; snow blower, elect. start, $550; circular saw, $12; heavy chest, bayonet saw, $20; Jr. Brit. encyclopedia, with case, $35. Joe, 261-7825.

PIONEER - super tuner, am/fm stereo cass., 40 watt booster speakers, $90. 924-6582.

WOOD BURNING STOVE - Timberline, heats entire home, $200; baby's bassinet, complete, new $80, used 2 months, $40. 929-4840.

CULLIGAN WATER SOFTENER - Mark 4, new cond., now have city water. 281-3093 after 5:30 p.m.

COLONIAL COUCH - chair, ottoman, rocker, $150; 2 dressers, maple, pine $25. ea.; night table $10. Lydia, Ext. 2380.

FLY ROD - antique bamboo, H&R, folsom arms, 50 yrs. old, excl. cond., 9', original case. Ext. 2294.

BRIDAL GOWN - veil, antique satin, size 11, fall/winter wedding. Lola Kopp, Ext. 2265.

LOVE SEAT - Duncan Phyfe, gold velvet, very good cond., $100. 588-4641.

GUITAR - Fender Mustang, excel. cond., $250. Rob, 928-1209.

SMALL ANTIQUE PIANO - 38" wide, make offer; fold-up bed on wheels, thick mattress. 298-4398.

BASSINETTE - white wicker, very large skirt, $20. 744-0722.

BOX SPRING - twin size, good and clean, $10; (3) coffee makers; coffee grinder, good & clean, $8/ea. Ext. 3589.

MAGNAVOX STEREO - hi-fi console, good cond., nice piece of furniture, good sound, $150; Wurlitzer organ, spinet, solid cherry, model 4300D, multimatic percussion, excel. cond., $900. Lloyd, Ext. 3381 or 286-1024.

BASS AMP - Baldwin professional, (2) 12" speakers, 4 inputs, loud, $350; Rawling lefty baseball glove, $35, neg. 281-3149.

FIREPLACE SCREEN - $10; Sears sewing machine, $20; G.E. new electric dryer, good for apt., $200. Victor, Ext. 2395.

TOPP'S BASEBALL CARDS - must see, large collection, make offer. Joe, 325-1080 after 5 p.m.

MEN'S & WOMEN'S DRESSERS - mahogany, cherry, antique, break front; Singer sewing machine. 744-5752.

WINDOW BLINDS - verticals, minis, wovenwood shades, custom colors and sizes. Jim Griffin, 281-2849.

SPEAKERS - 1 pair, K.E.I., columns 18"x56", each has two 12" and speakers, $250. 924-7677.

PORTABLE CB - $35; air mattress, $10; 2 adult vest life preservers, $6 for both. 744-9832.

COFFEE TABLE - new, never used, oval Colonial type, $75. 589-0643.

BARBER CHAIR - early 1900's, white & green upholstery, great conversation piece, must see, $100. 422-1846 after 7 p.m.

POOL SAND FILTER - 1/2 HP pump, multi-port all P.V.C., $50. Al, Ext. 2075.

SWAGLAMP - 16", brown wicker shade, $30; bookcase headboard, double, $25; Zenith B&W TV, $25. 744-6874.

CHILD'S BIKE - red, 16", very good cond., $22. Ext. 4935.

GAS STOVE - 30", coppertone, good cond., asking $90. 286-1169.

REFRIGERATOR/FREEZER - avocado color, good cond., $100. Ext. 3593 or 286-3540 eves.

WOMAN'S TOURING BICYCLE - 10 spd., Iverson, white, excel. cond., $65; bicycle built for two-tandem, excel. cond., $100. Aug, Ext. 2898 or 363-7620.

OPERA TICKETS - Sept. 2; U.S. Open tennis tickets, Sept. 1. Bob, Ext. 7785.

BEDSPREADS - twin size, red, white & blue; King size, gold & beige, $15/ea. Les, Ext. 2920.

HIGH CHAIR - Bobby Mack; Hedstrom stroller, best offer. 981-5696.

SEARS COLOR TV - 19", very good, $140; infant car seat, like new, $25. Ext. 7759 or 3073 eves.

FURNITURE - bits & pieces. 246-8297.

DINETTE SET - contemporary, octagonal smoked glass table w/chrome & 4 chairs, w/deep brown covering, $200. 467-8563.

UNIVOX 100 WATT GUITAR AMP -very good cond., $100 neg. Bill Sanchez, Ext. 3848 or 281-6498.

G.E. FREEZER - 15 cu. ft., manual defrost, excel. running cond., $100. Dave, Ext. 7922.

FORMAL DINING SET - Chippendale circa 1920, 6 chairs, buffet, china closet, table, antique finish. 751-2149 after 6 p.m.

NATIONAL GEOGRAPHIC MAGAZINES - 1970's issues, make offer. 727-5912.

ELECTRIC TYPEWRITER - Smith Corona, script letters only, like new; ITT touch tone trim line phone, brown; Petite Curie ivory phone; telephone answering machine, like new. 751-6418.

JACKET - misses size 6, red wool, elegant, fashionable, never worn, orig. price $120, best reasonable offer. Janet, Ext. 2345 or 929-8152.

Free

DISHWASHER - works, take away. Jerry, Ext. 7427 or 475-5591 after 6 p.m.

PUPPIES - need loving homes, black Lab/Weimaraner cross. Miriam, 473-5060 after 6 p.m.

Car Pools

NORTHPORT/FT. SALONGA - 8:30-5:00, need one or two additional drivers. Walt, Ext. 7154 or Eva, Ext. 7772.

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 Rent

YAPHANK - Condo Town House, 3 bdrm., 2-1/2 baths, cent. air, w/w, full basement, appliances, pool, club house, tennis, 2-1/2 mi. from Lab., furn. or unfurn. Leo, Ext. 4615 or 924-3928.

FLORIDA - Springhill, 45 mi. N of Tampa, 2 bdrm. house, winter season or monthly, near golf, tennis, lake, Gulf breezes, completely furn., reas. Ext. 4530 or 261-2719 after 5 p.m.

BERKSHIRES CHALET - 3 hrs. from NYC, 3 bdrm., 2 baths, fully equip. kit., elec. heat, deck w/spectacular view, near lake, hiking trails, avail. wknd or wkly. 929-6946 after 6 p.m.

SHOREHAM - garage, $20/month. Pete, Ext. 3297 or 821-9547.

MASTIC - 2 bdrm apt., heat & elec. incl., $550/mo. Ext. 3376.

PORT JEFFERSON VILLAGE - sublet for 3 mos., then 1 year lease, 1 bdrm., balcony, close to shops, $375 incl. heat. 246-8297.

E. PATCHOGUE - large 1 bdrm., near beach, pool, tennis, util. incl., $450/mo. 289-9724.

PORT JEFFERSON VILLAGE - 2 bdrm. house, new EIK, all appl., front & back porch, walk to everywhere, $1,000 neg. Ext. 4853 after 1 p.m. or 473-4948 after 6 p.m.

MILLER PLACE - 4 bdrm. house, 10 rooms, fireplace, new baths, new kitchen, fenced yard, 2 car garage, walking distance to beach & stores, 15 min. to Lab or SUNY Stony Brook, many extras. Ann, Ext. 2022 or 744-8386.

MOUNT WASHINGTON VALLEY, N.H. - contemporary chalet, weekly or weekends, Sept. & Oct., 3 bdrms., 2 baths, deck, wood stove, dishwasher, w/d, reasonable. 928-6921.

For Sale

ST. JAMES - farm colonial, 4 bdrm., eik, 3 baths, finished basement, gas heat, brick walks, appliances, excel. cond., low taxes, $122,000. Ext. 5061 or 862-6650 eves.

MILLER PLACE - colonial, 4 bdrms., formal l/r, d/r, country kitchen, fam. room w/brick fplc., 9 acre, $158,000. 331-1718.

RIDGE - 4 bdrm. colonial, l/r, d/r, eik, den, basement, drive-in garage, oak floors, sun and shade, berry bushes and chipmunks, very convenient to BNL. 924-0425.

PATCHOGUE - 3 bdrm. ranch, mint cond., immaculate, oak floors, large country kitchen, finished basement, fenced yard, dead end street, move in cond., many extras, $79,500. 289-2274.

Lost & Found

FOUND - eyeglass case with contacts, found in parking lot behind Bldg. 510. Diane, Ext. 7114.

LOST - lefty's softball glove at field 2, Mon. Aug. 16. Kathy, Ext. 3420.

Wanted

VENDORS - for church flea market, 9/8, raindate 9/15, exit 70, $5/space; Manorville. 878-6637 or 727-1170 Manorville.

TWO WOMEN - to complete bowling team in women's league. Louise, Ext. 3397/3366.

PLAY PEN - for infant, good cond. Michele, Ext. 2927 or 286-9226.

STEREO AMPLIFIER - 500 watt. George Hrabak, 589-0819.

INFO - on satellite TV dish system for home use. Paul, Ext. 2350.

SPONSOR - for Sept. Camp Paquatuck charity bicycle ride, 1/mi., max. $10.80. Gerry, Ext. 4841.

CAR SEAT - Century 200 model, will buy or swap for Cosco Peterson Safe-T-Seat. 744-0722.

HOUSEKEEPER AND BABYSITTER - 3-5 days/week. 289-9724.

HOUSE OR APT. - to rent, retired couples needs place for 1 or 2 weeks. Ext. 4192 or 751-7787.

CLEAN FILL - approx. 20 cu. yards. Ext. 2492 or 475-8658 after 7 p.m.

POST CEREAL & FUN FITNESS LABELS - Charles Goldstein, Ext. 4169 or Bldg. 515.

MEN'S BIKE - 10 spd., 22-24" frame, repairable o.k.; CRT monitor for computer, Comm. 64, reasonable. Bill Sanchez, Ext. 3848 or 281-6498.

HOUSEMATE WITH CHILD - to share large house in Shoreham, good schools, finances neg. Ext. 3401 or 744-6229.

PART TIME COMPUTER TEACHER - private school. 583-4477.

Classified Ad Policy

Deadline is 4:30 p.m. Friday for publication Friday of the following week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's property.
3. Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
4. Ads for the sale or trade of firearms will not be accepted.
5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated. One ad per person per week.
7. **Property for sale or rent cannot be accepted on this form. Special Real Estate Ad Forms are available at the office of the Brookhaven Bulletin, Building 134.**

☐ For Sale: Autos & Auto Supplies
☐ For Sale: Boats & Marine Supplies
☐ For Sale: Miscellaneous
☐ Car Pools
☐ Lost & Found
☐ Wanted
☐ Free
☐ _____

Please print your ad below in 15 words or less using one word per block. Include name and phone number to call.

Note: The following must be completed for your ad to appear.

NAME (Please Print) .....

Employee's Signature ..... Life No. ..... Ext. .....

Send to: Brookhaven Bulletin, Building 134 (Ext. 2345)