

U.S./Japan Research Gets Under Way at Reactor

It weighs in at several thousand pounds, but is capable of floating on a film of air so thin that you could not slide a piece of paper between it and the floor. This engineering marvel is a new polarized beam neutron spectrometer installed at the High Flux Beam Reactor (HFBR).

The new spectrometer was commissioned in March, after three years of construction and \$1 million in construction funds from the Japanese. The machine was built under a formal agreement between the U.S. and Japan to cooperate on neutron scattering research, and it promises to be the cornerstone in a long and productive program shared by the two countries. Experiments are scheduled to begin this month.

Under the cooperative agreement, which officially extends into the next decade, two Japanese scientists each year will come to BNL to do joint research with two American scientists at the HFBR. They will use the spectrometer for experiments on phase transitions, magnetism and lattice dynamics.

The HFBR is a source of neutrons. Since neutrons have no electrical charge, they penetrate matter easily and are ideal probes for measuring the position and motion of atoms in condensed matter. Neutron spectrometers are the tools that allow scientists to use neutrons, and so play a major part in studies of the physical properties of matter.

The concept for the new spectrometer originated with BNL's Gen Shirane and Professors Sadao Hoshino and Yuji Ito of the University of Tokyo. Japan's coordinating institution for the project. They envisioned a versatile machine, finely controlled by computer.

A conventional neutron spectrometer has four elements: the monochromator, the sample, the analyzer and the detector. Each element must be positioned relative to the other and oriented with respect to the incoming neutron beam from the reactor. Precision positioning and the ability to

reproduce exact positions are essential.

According to Andrew Kevey, project engineer, the engineering challenge lies in the fact that the assemblies of the four elements, plus shielding and auxiliary equipment, weigh several thousand pounds. How to move them around? "As a departure from earlier BNL designs," says Kevey, "this spectrometer uses air pads and a Tanzboden for moving the assemblies." Tanzboden is a German word for dance floor, and, in the neutron scattering field, the term is generally used to describe a very flat, smooth and level floor usually made of marble on granite.

To reduce costs, a new floor construction technique using epoxy was developed. It worked well for a prototype Tanzboden, and a full-size one was installed at the HFBR. To move the spectrometer, a thin film (less than a thousandth of an inch) of air is blown under pressure between the air pads and the Tanzboden, and computer-controlled motor drives can precisely position the machine.

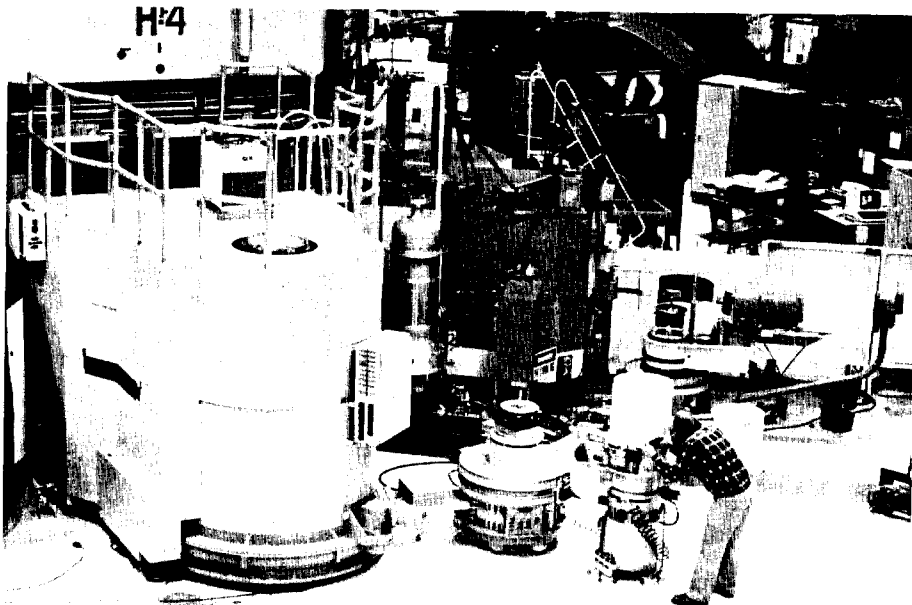
Kevey has called this a "textbook project" from beginning to end. As proof, the machine was installed on time, within budget and in fine working order.

Credit is due in particular to Hideki Yoshizawa, who is the project's resident liaison scientist from Japan, and Chuck Majkrzak, BNL physicist. Others made important contributions in various fields: design — Carl Canter, Frank Langdon, Arthur Nintzel, John Plonski and Jeffrey Zahradka; assembly, testing and installation — Frank Merkert Jr., Albert Roberts and Richard Rothe Jr.; fabrication (both in Central Shops and the Physics Department staff shop) — Carl Holmstrom, Enrique Jimenez, Alfred Roebuck; spectrometer control — Gerd Dimmler, John Gannon, Mary Anne Kelley, Seymour Rankowitz, Walter Sargent; procurement — Richard Hill, Peter Sikinger and Virginia Stewart of Physics did budgeting and accounting.



Mort Rosen

From March 17-21, Professors Sadao Hoshino and Yasusada Yamada, members of a U.S./Japan joint research committee, came to Brookhaven Lab to celebrate the commissioning of a new spectrometer at the High Flux Beam Reactor and to have discussions with their American counterparts, BNL's Gen Shirane and John Axe. At a dinner party hosted by the Japanese on March 18, the invited guests, both builders and future users of the spectrometer, toasted to a long and productive U.S./Japan cooperative program. The spectrometer was built with Japanese funds and will be used for neutron scattering experiments. At the reactor, with the spectrometer in the background, are (from left): Victor Emery, BNL; Yasusada Yamada, Osaka University; BNL Associate Director Martin Blume; Sadao Hoshino, University of Tokyo; and Hideki Yoshizawa, John Axe, Andrew Kevey, Frank Langdon and Gen Shirane, all of BNL.



Mort Rosen

The new spectrometer is located at beam port H-4 at the High Flux Beam Reactor. Here, Richard Rothe Jr. is making fine adjustments on the machine. The spectrometer is remotely controlled by a computer, which, depending on the data being collected, can adjust the position of the machine for better data gathering.

Lab Tours Have Wide Appeal

Last Saturday, 29 members of the Junior Academy of the New York Academy of Sciences took their eighth annual tour of the Laboratory, where they were hosted by Chemist Don Metz.

The Junior Academy is open to New York City high school students who are interested in science as a career.

The 1500 members meet once a month for a lecture by a scientist, have a twice-a-week tutorial in math and science, are offered a year-long computer course and take field trips throughout the year.

The students were introduced to nuclear physics at the Tandem Van de Graaff by Ole Hansen and Harvey

Wegner. After lunch, Michael Tanenbaum discussed particle physics at the AGS, Thomas Ludlam talked about RHIC and relativistic heavy ion physics, and William Thomlinson explained how the NSLS worked and what research is being conducted there. The Junior Academy's last stop was PETT IV, where Jerome Russell met with them.

The Tour Program of Public Relations offers similar college-level and professional tours throughout the year for groups of scientists, and for graduate and college students studying science. Since October 1, 317 visitors have taken one of these tours, and about 400 more have booked a date.

Classes of school children from fifth grade through twelfth, and organized groups, such as senior citizens and civic associations, are offered a shorter, more general, guided tour of the Lab, including a bus ride around the site and a walk through the Exhibit Center. To date, 3,375 school children and adults have been guided about the site, and 2,000 more are expected by the end of the fiscal year. To make an appointment for an arranged tour, call Ext. 2345.

Inside Info

Paul Reardon, Associate Director for High Energy Facilities, has been invited to speak on superconducting magnet development at a Symposium on the Superconducting Super Collider at Harvard on April 17. The symposium has been organized under the 1984-85 Morris Loeb Lectures in Physics.

Gen Shirane, Neutron Scattering group leader, Physics Department, has been given a Senior U.S. Scientist Award by the Alexander von Humboldt Foundation, West Germany. His research will be performed at the Hahn-Meitner Institute for Nuclear Studies, Berlin, and he will be there for six months, beginning May 15. Shirane will collaborate with members of the Institute on techniques of neutron scattering.

The awards were established in 1972 by the Federal Republic of Germany to promote the exchange of ideas between American and German scientists and research institutions. The U.S. scientists nominated must have gained international reputations in their fields. Shirane is the ninth scientist from BNL to win this award.



Alex Rubin

At the Exhibit Center, some members of the Junior Academy examined the various exhibits describing science at BNL. Tour Guide Elaine Lowenstein (center) used a model to explain how the Graphite Research Reactor, housed in the building in which they were, operated from the early 50's to the late 60's.

Speakers Bureau

Jerry Cadwell (DNE), Shoreham-Wading River High School Career Day, Careers in Law and Engineering, December 12, 1984.

Harold Kirk (Accel.), Hauppauge Jr. High School Science Club, High Energy Physics Accelerators at BNL, January 23.

Neil Baggett (Phys.), Rotary Club of Middle Island, Particle Physics Today, January 28.

Edward Murphy (PE), Boy Scouts of America Career Day at Cold Spring Harbor High School, Engineering as a Career, February 1.

William McGahern (HEF), Career Awareness Day at Half Hollow Hills High School West, Careers in Science and Engineering, February 12.

Morris Strongson (AMD), Boy Scouts of America Career Day at Ward Melville High School, Careers in Computers, March 5.

Sharon Smith (DAS), Southampton College, Biology at the Ice Edge in the Greenland Sea, March 7. Patchogue Bay Power Squadron, Oceanography, March 8.

Russell Dietz (DAS), **Eleanor Grist (Bio.)**, **Avril Woodhead (Bio.)**, 20th Annual Science Fair at Shelter Island High School, Science Fair Judges, March 15.

Martha Heine (Med.), Suffolk County Girl Scouts Council Career Conference, Careers for Women in Science, March 16.

Wolfgang Wulff (DNE), Navy Nuclear Power Seminar at SUNY Maritime College, How a Nuclear Reactor Works: Theory and History, March 23.

Glenn Price (DO), St. Isidore School Science Fair, Science Fair Judge, March 27.



Members of Elisa Hendrey's English class meet at the Rec Hall for a session. Seated from left, they are: Yukiko Kobayashi (Japan), Rosaria Vignola (Italy), Zhengou Li (China), Yoko Lim (Japan), Elisa Hendrey (USA), Maria Teresa Andreu (Spain), Willie Matthijs (The Netherlands), and Lucia Cardoso (Brazil). Standing are Luigi Zecca and Patricia Zecca from Italy.

—Roger Stouenburgh

English as a Foreign Language

English is a foreign language for many BNL visitors from other countries and their families. To help them become familiar with and more fluent in the language spoken in America, the Lab offers continuous English classes on Mondays in the Recreation Building. They are taught by Elisa Hendrey.

The English class for beginners is held from 7 to 8:30 p.m., and the advanced class goes from 8:30 to 10 p.m. They are open to all Lab employees, guests and their families from other countries who wish to speak and read English. The attendance of the two classes overlaps, as many students, beginner and advanced, want to learn English as quickly as they can.

Maria Teresa Andreu, who is from Spain and the wife of Research Collaborator Francisco Botella-Olcina, Physics, is a beginner who spoke no English when she arrived at the Lab. "I am learning English because of the class," says Andreu, "and I like the teacher because she speaks slowly and explains everything."

"I studied English in school and took private English lessons, but my English wasn't good enough to talk with other people," says advanced student Willie Matthijs of The Netherlands, wife of Biology Research Associate Johannes Matthijs. "I take both classes because they are a good exercise in English conversation."

"My purpose is to improve my English," explains Chemistry Research Collaborator Luigi Zecca from Italy,

"and my conversation has generally improved. I write papers and read journals in English, so I feel that learning to speak better English is practical for my work."

"I like the class because the teacher will correct our pronunciation as we speak and read out loud," says Rosaria Vignola, who is from Italy and the wife of Visiting Scientist Gaetano Vignola, NSLS. "I studied English in high school, but the emphasis was on grammar and reading, not on speaking. I like to practice speaking English — I will talk with anyone about anything. I especially like discussing American history and holidays."

American English, like all languages, is more than grammar and vocabulary, so Hendrey incorporates U.S. current events, culture, history and traditions into the classes' discussions. She distributes newspaper stories and magazine features to her students as sources for these discussions. For instance, one Monday evening during February, which was Black History Month, Hendrey used Martin Luther King's "I Have a Dream" speech as the text. In addition, the beginning English class uses an English-as-a-second-language textbook.

Hendrey will first read a paragraph from the evening's text out loud, so the students can hear how a native pronounces the words and puts them together in sentences. Each student in turn will read a passage and be corrected as he or she reads. Then all will question and discuss its meaning.

In addition to talking about America, the members of the class talk about their own countries, but in English. For example, when the issue of raising the drinking age was raised by politicians, the English class talked about the problem of teenage alcohol abuse in other countries.

"I find it interesting when people speak about the culture and traditions of their countries," says Patricia Zecca from Italy, wife of Luigi Zecca. "We have also talked about the food, games and other things that are different and the same in our countries."

Outside of class, the English students have gotten together to experience such American traditions as a Fourth of July picnic and a Thanksgiving dinner. And they have viewed art work from their own countries in New York and Long Island museums.

The English classes began seven years ago as a result of a problem in translation. "I said to a Japanese friend who lived on site that I would some day enjoy teaching English as a second language to foreign visitors at the Lab," says Hendrey. "My Japanese friend thought I said I was going to teach such a class. She thought that was a great idea, knew of other people living on site who would like it and offered to have the class in her apartment. Rather than disappoint her, I started the class."

Hendrey had taught English to native and foreign speakers before. She is certified to teach English, has taught high school and junior college students English language and literature, and chaired a high school English department. She taught English as a second language to students in Morocco, and tutored individual foreign students of the Shoreham-Wading River School District.

The first three-hour, once-a-week classes were attended by about a dozen people, and since they were so successful, Personnel offered to hire Hendrey to continue teaching. "The class moved out of my friend's apartment and into the lounge of the Recreation Hall, which is like a living room," says Hendrey. "We want to keep the atmosphere informal because that encourages people to try to speak English more freely."

— Marsha Belford

Arrivals & Departures

Arrivals

Frank G. Muller Physics
Edward J. Whittle Biology

Departures

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

Noreen T. Corley DNE
Daniel L. Costa Medical
Edward Densieski AGS
Detlef Gabel Medical
Theodore Klosowicz Physics
Robert J. Mayer, Jr. Pl. Eng.
Hans R. Moser NSLS
Marwin J. Rapkin S&EP
Lawrence M. Woodworth DAS

Did You Know: electrons go around the small electron storage ring of the NSLS five million times per second. The circumference of that ring is 50 meters.



The Danish House is coming along quickly. By Tuesday afternoon, when this photo was taken, the tiled roof was being finished, and the brick facing was being laid. Inside, plumbing, electrical work, painting and paper hanging were being done. Because of the interest in this house, many employees are showing up on the construction site to see how the work is progressing. Though the interest is appreciated, the presence of employees is impeding the workmen and is dangerous. Please stay behind the fence and wait until the employees-only open house scheduled for April 19. On this day, the completed house can be toured from 11 a.m. to 2 p.m. and from 4 p.m. to 6 p.m. The public will be able to tour the Danish House on June 1 and 2.

— Alex Reben

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.

NUREG/CR-2331
BNL-NUREG-51454
Vol. 3, No. 4

Safety Research Programs Sponsored by Office of Nuclear Regulatory Research. Quarterly Progress Report Oct. 1 - Dec. 31, 1983. A.J. Weiss, compiled by.

BNL-51676
Health and Environmental Effects Document for Photovoltaic Energy Systems - 1983. P.D. Moskowitz, et al.

BNL-51753
Semiannual Report for the Period Apr. 1, 1983 to Sept. 30, 1983.
1) Superconducting Power Transmission System Development
2) Cable Insulation Development Advanced Technology Applications Div.

PC Users Meeting

The PC/Workstations Group will meet on Tuesday, April 9 at 10 a.m. in the Applied Mathematics Department Seminar Room. IBM will give a presentation on their Professional Graphics Display and Adapter.

BROOKHAVEN BULLETIN

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—BERA News—

At the BERA Store

The BERA Sales and Service office in Berkner Hall is open each workday between 11 a.m. and 4 p.m. In addition to the newly improved film processing service supplied by 20/20 PHOTO, the following items are available:

Sales

Film, flashbulbs, batteries, a new line of Gordon Fraser Gallery greeting cards, and a limited supply of cookbooks compiled by the BERA Cooking Exchange.

Tickets

Magic Kingdom membership cards — no charge. Great Adventure — Amusement Park \$12, combination Amusement Park and Safari \$13. UA (United Artists) Theaters \$2.50. Metropolitan Opera and Islanders hockey tickets are sold during the regular season. (Dates for start of tickets sales are usually announced in the Bulletin one week in advance.)

The BERA Store is also designated as the official redemption center for the BERA Participation Awards.

Any questions pertaining to store activities may be addressed to Pat Manzella, Ext. 3347.

Swim Club

The BNL Swim Club is organizing car pools for those who wish to swim after work at the Brookhaven Town/Mastic YMCA pool while the BNL pool is closed. Swimmers who can offer rides and those who need one should call Jim Lipka, Ext. 3372. The Swim Club will continue to meet, but informally, on the first and third Thursday of each month at 5:30 p.m. at the Mastic YMCA pool. For more information, call Marsha Belford, Ext. 3327, or Mark Catan, Ext. 2504.

Bowling

Purple League

High games were bowled by Valerie Green 194, Marge Stoeckel 190, Pat Manzella 180, Nancy Roesler 178, Fran Brown 173.

Red/Green League

H. Marshall rolled a 241, J. Ferrante 228/220/638 scratch series, R. Sick 220, J. Petro 217, T. Holmquist 211, D. Jesaitis 208, E. Sperry 206, K. Riker 204, J. Connelly 204, T. Prach 204, C. Tomesch 202.

Pink League

S. Asselta had a 230 game.

White League

Caryl MacDougall bowled a 201, Sharon Smith 192/188, Millie Connelly 181, Sandy Asselta 180, Jim Griffin 232/600 series.

At the L.I. Industrial Tournament, BNL finished 8th in the overall scratch standings.

Astronomical Society

Observation night this month will be Friday, April 12, beginning at dusk, with the following Friday evening as the rain date. Those planning to attend should check with Bob Mills, Ext. 5043, or Rick Jackimowicz, Ext. 3803, on the afternoon in question. Come early; latecomers risk finding an empty, locked building.

Motorcycle Club

A meeting will be held on Monday, April 8 at 5:15 p.m. at the Recreation Building. Now is the time to start planning for our spring gathering and the rest of the 1985 season. Please attend.



PANOCHA STRING QUARTET

The Panocha String Quartet, which has met with world acclaim since its formation in 1968 in Prague, Czechoslovakia, will give a concert in Berkner Hall on Thursday, April 11, at 8:30 p.m.

The members of the Quartet were students at the Prague Conservatory when they began playing together. First violinist Jiri Panocha lends his name to the ensemble; the other musicians are second violinist Pavel Zejfart, violist Miroslav Sehnoutka, and

cellist Jaroslav Kulhan. All are equally distinguished solo performers.

For their program at Brookhaven, the ensemble will play Quartet in D minor, K. 421 by Mozart, Quartet in F minor, Op. 95 by Beethoven and Dvořák's Quartet No. 14 in A flat major, Op. 105.

Tickets will be sold at the door. General admission is \$8; students and those over 65, \$5; and those under 18, \$3.

Singles Club

The April meeting will be held in Berkner Hall Lobby, Tuesday, April 9, from 12:20 to 12:40 p.m. The club is sponsoring a trip to the Poconos on May 17 through May 19, which includes whitewater rafting and adventure on mules. Bus leaves BNL 4:30 p.m., Friday, May 17. \$130/4 per room, \$154/2 per room. Deposit of \$35 due now, balance by May 3. Call Doris Terry, Ext. 2228 for details.

Volleyball

C League

Team	W-L
Captain Midnight	37-14
Tigers	36-16
Screw Balls	32-19
Craw	19-32
Quarks	18-33
Couples	12-39

Open League

Phoenix	53-1
Odds & Sods	31-23
Half Lifes	25-29
Rowdy Radicals	22-32
Team 6	22-32
Generic	9-45

Congratulations to Odds & Sods for breaking Phoenix's shutout by winning one game with the score of 15-9. Congratulations to UpFaGrabs, A League; TNT and Fossils in the B League. Next week Dinkers-UpFaGrabs, A League, 5:30 p.m., 5 game series and Fossils-TNT, B League, 5:30 p.m., 5 game series. 13859

Aviation Club

The Brookhaven Flying Club will meet at Berkner Hall on Wednesday, April 10 at noon.

That evening, the Club will sponsor an FAA Safety Seminar at Berkner Hall. The seminar will start at 7:30 p.m. and continue until 10 p.m. All those interested in aviation and aviation safety are invited. Refreshments will be served.

Cooking Exchange

The theme of the April 10 meeting of the Cooking Exchange will be Korean Barbecue. The true character of Korean cookery is made evident by the use of sesame seeds, sesame oil and crushed red pepper.

Cooking Exchange meetings are held in the Recreation Building on the second and fourth Wednesdays of each month from 12:30 to 2:30 p.m. The club is open to employees and their immediate family members. A one dollar donation entitles those present to copies of the day's recipes, taste samples of the prepared dishes, and coffee or tea. Babysitting is provided at 50¢ per child.

For more information call Dee Polychronakos, 744-3578, or Mizuko Kishimoto, 282-3029.

Basketball

First Game

Hollywood - 77

R. Domenech	3
G. Grigg	14
R. Kowalski	2
G. Mack	14
E. Meier	25
D. Nordstrom	14
A. Richardson	5

Longshots - 54

P. Brown	11
J. Gaeta	4
J. Gaffney	15
J. Garrison	5
L. James	11
B. Jasper	2
R. Rowley	6

Second Game

Coasters - 79

K. Cosgrove	2
R. Doty	15
M. Fulkerson	22
L. Smith	11
A. Washington	14
M. Williams	15

Runaways - 77

S. Gilbert	9
T. James	20
P. Johnson	19
T. Mooney	2
G. Shepherd	14
M. Tardd	13

The Numbers Game

It has come to our attention that not everyone reads every word in the Bulletin. In fact, we understand that some people only skim the "good stuff" (over which we labor) and then bury themselves in the ads. Well, this is a pretty kettle of fish.

In order to instill new, constructive habits in our readers we are offering a small enticement, not a bribe, mind you, just an enticement. Starting today, and continuing for the month of April, we will place life numbers of two current employees somewhere in the Bulletin (not in the ads) each Friday. Those who find their life numbers and report to us on Ext. 2345 will receive an interesting trinket from the Science Store. Among other things, such trinkets include luggage tags, Frisbees and gyroscopes.

So keep your eyes open, keep informed and win a prize! 8168

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to New York City on Wednesday, April 17. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare for adults is \$5; children under five years ride free.

Reserve a ticket by sending your fare through the U.S. mail to BNL, P.O. Box 322, Upton, New York 11973. Please do not send cash. Checks or money orders, payable to BNL, must be received by Friday, April 12. Put the date of the trip, your life number and your phone number on the back of your check or money order. Your tickets will be given to you at the station on the day of the trip. Refunds will be made only if cancellations are received by the Monday morning preceding the trip.

Cafeteria Menu

Week Ending April 12

Monday, April 8	
Beef barley soup	(cup) .65 (bowl) .85
Swedish meatballs on noodles	2.10
Macaroni, ham & cheese w/1 veg.	2.15
Hot Deli — Pastrami round	(bread) 2.05 (roll) 2.25
Tuesday, April 9	
Navy bean soup	(cup) .65 (bowl) .85
Beef & broccoli stir fry on rice pilau	2.20
Breaded pork chop & 1 veg.	2.20
Hot Deli — Baked ham	(cup) 2.00 (bowl) 2.20
Wednesday, April 10	
Garden vegetable soup	(cup) .65 (bowl) .85
Veal stew on egg noodles	2.20
Chicken burritos & 1 veg.	2.15
Hot Deli — Turkey breast	(bread) 2.10 (roll) 2.30
Thursday, April 11	
Minestrone soup	(cup) .65 (bowl) .85
Baked lasagna & 1 veg.	2.20
Sauerbraten & potato pancake	2.25
Hot Deli — Grilled Reuben	2.05
Friday, April 12	
Seafood chowder	(cup) .65 (bowl) .85
Top round of beef & 1 veg.	2.15
Broiled fish fillet & 1 veg.	2.10
Hot Deli — Clam boat	2.15

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 Employment Manager, Ext. 2882.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

2210. BUILDING AND GROUNDS UTILITY WORKER. Plant Engineering Division.

2211. LABORER (6 positions - temporary - 5/20/85 to 9/27/85) - Plant Engineering Division.

2212. LAUNDRY OPERATOR B (2 positions - temporary - 5/20/85 to 10/11/85) - Plant Engineering Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2213. ELECTRICIAN A (temporary) - Under minimum supervision lays out, constructs, installs, maintains, repairs and operates electrical systems, equipment, controls and related devices. Requires minimum of five years' industrial electrician experience. Plant Engineering Division.

2214. STEAMFITTER A (temporary) - Requires substantial experience in the commercial/industrial sector as a steamfitter. Will be responsible for the layout, construction, installation, maintenance and repair of heat, steam and water distribution systems, related facilities and auxiliary equipment. Plant Engineering Division.

2215. PLUMBER A (temporary) - Requires successful completion of a four-year apprenticeship program and/or substantial experience in the commercial/industrial sector as a plumber. Will be responsible for the layout, construction, installation, repair and maintenance of water, sewage and gas systems, related facilities and auxiliary equipment. Plant Engineering Division.

2216. CARPENTER (temporary) - Under minimum supervision lays out, constructs, modifies and maintains buildings and component parts from construction drawings, rough sketches or verbal instruction. Works with wood, wood substitutes, and combination materials and flooring, roofing and wall materials. Plant Engineering Division.

Autos & Auto Supplies

79 SUNBIRD - V6, 5 spd., new tires, battery, radiator, alternator, muffler, best offer. 732-1877.

74 FORD PINTO WAGON - a/t, good cond., new transmission. \$900. Ext. 7578 or 744-2715.

81 POP-UP TRAILER - Viking, ice box, sink, stove, heater, awning, excel., \$2,300. Skora, Ext. 5046 or 744-9677.

78 PLYMOUTH HORIZON - manual transmission, 35 mpg, orig. owner, \$1,500. Ext. 3871 or 878-1954.

75 FIAT 128 - 4 spd., am/fm, good engine, (2) new tires, needs work, \$350. Ext. 3714 or 3208 after 7 p.m.

80 TOYOTA COROLLA - great mpg, 5 spd., excel. mechan. cond., orig. owner, \$2,850. 269-5648.

73 FORD F100 PICKUP - w/cap, V8, std. transmission, \$1,150. 924-4262.

IN-DASH STEREO - Audiovox, am/fm 8-track, \$35; power antenna, \$25; speakers, Jensen, 5-1/4", \$30/pr.; Pioneer, TS100, 4", \$20/pr.; TS107, 4", \$25/pr., all new. Ext. 2462.

75 TRIUMPH SPITFIRE - convertible, excel. body & mech., 30k mi., am/fm, hard top, \$2,800. 744-2169.

350 CHEVY SHORT BLOCKS - (2), both apart, need work, \$50 ea.; Manley pistons, 327+ .030.043 rings w/L.W. pins, \$150; alum. super rods, \$100. Bill, 399-6168.

67 UTILITY TRAILER - home-made, heavy duty suspension, good tires, \$200. Mike, Ext. 4605 or 281-5456 eves.

81 FIREBIRD - dark grey, red & silver pinstripe, excel. cond., 51k mi., \$5,500, must see. 289-9467.

68 DODGE DART - 6 cyl., 2 dr., good transportation. Dave, 281-8957.

81 KAWASAKI - 440 LTD, bought new '82, new battery, well maintained, sissybar, \$800. 744-3968 leave message.

70 DODGE DART - standard, 4 dr., 62k orig. mi., creampuff. 878-2233 after 6 p.m.

73 FORD STATION WAGON - a/t, p/s, p/b, 351, many new parts, best offer. 475-6981.

75 PLYMOUTH FURY - 9 passenger wagon, V8, p/s, p/b, a/c, rack, Class 3 hitch, high mi., \$1,200. 751-6076.

79 YAMAHA 650 - Special II, 10k mi., very good cond., asking \$750. Henry, 878 9551 after 6 p.m.

73 FORD GRAND TORINO WAGON - recently tuned up & inspected, \$750. Steve, 744 4787 eves.

76 FORD PINTO - station wagon, 4 cyl., standard transmission, 65k mi., new brakes, exhaust. \$950. Ext. 2442 or 3125.

80 DATSUN PICKUP - w/cap, 20+ mpg, many new parts, runs well, \$2,100. 585-7572 eves.

63 STUDEBAKER - Cruiser, have fun this summer, drive a Studebaker, \$800. Kevin, 281-8031.

77 VOLARE WAGON - 6 cyl., 4 spd., new clutch, tires, brake cylinders, linings, rebuilt trans., \$850. Ext. 3786.

POP-UP BRAVO - sleeps 7-9, s/s, icebox, trunk, heater, slide-out kitchen, awning, asking \$900. Mike, 732-9324.

81 FIBERGLASS CAP - 8' truck bed, \$200. 929-3483.

76 MALIBU - 2 dr., 3 spd., a/c, high mi., looks good, runs well, \$850 or best offer. Skora, Ext. 5046 or 744-9677.

76 DODGE ASPEN - station wagon, 6 cyl., 74k mi., standard shift, ski rack, asking \$1,400. 473-8877.

MC TIRES - Dunlop, brand new, 150/90 H15, tubeless; blackwall, tube, model K627B, \$55; motorcycle parts & accessories. 325-9580 after 6 p.m.

77 VOLARE - wagon, 6 cyl., 4 spd., new clutch, tires, brake cylinders, linings, rebuilt trans., \$850. Ext. 3786.

75 HONDA MOTORCYCLE - fully dressed, many extras, ready to go, 750cc, excel. cond., \$1,300. 878-4664.

74 OPEL MANTA - sunroof, a/t, am/fm cass., runs well, looks good, needs carb & muffler. \$700. Michael, 585-4038.

GM FLOOR MATS - set of 4, grey, new, \$20; 15" wheels, 6 lug, \$20 ea. Ext. 2462.

CHEVY MALIBU - must sell, moving, reliable, a/t, a/c, p/s, p/b. John, Ext. 5515 or 246-8293 or 744-1793 eves.

77 CHEVY MALIBU - wagon, p/s, am/fm, 350ci, 8 cyl., excel. cond., \$2,400. 331-2271 after 5 p.m.

71 CHRYSLER PARTS - very good cond., 4 barrel carb, alternator, distrib., wires/cap, tranny motor. 654-8438 eves.

73 MUSTANG - V8, a/t, p/s, p/b, new radials, exhaust, battery, \$1,000. 475-5343 after 6:30 p.m.

73 THUNDERBIRD - must sell, p/sun roof, 4 new tires, all power, TV antenna, loaded, mint cond., Chris, 360-2212 days or 588-9504 eves.

79 MAZDA GLC - 4 spd., orig. owner, excel. running cond., \$2,000. 924-3066.

82 THUNDERBIRD - Heritage, custom made, low mi., grey velour interior, moon roof, spoke wheels, loaded, \$8,500. Ext. 2956.

80 PINTO - 17k mi., mint cond., \$2,500. Ext. 2103.

73 DUSTER - 6 cyl., runs fine, good second car; 76 Kawasaki KZ400, trunk bags, fairing, \$300 firm. 821-0758, 6 to 8 p.m.

235 CI ENGINE - power glide trans. and rear for 1955-1964 Chevy, 68k mi. Joe, Ext. 2556.

82-1/2 TOYOTA TERCEL - SR-5, a/c, 5 spd., 58k mi., excel. cond., many extras, \$4,600. Henry, Ext. 4547 or 924-6688.

Boats & Marine Supplies

27' TARTAN - auxiliary documented, cruise and race equipped, light blue hull, white/gray top, 12 sails, atomic 4 FW cooled. Ext. 4258 or 669-9202.

MUSHROOM MOORINGS - 2 ea. w/chain & buoy, (1) 300 lbs., (1) 250 lbs., best offer. 331-4052.

21' FORMULA - 1968, 185 HP Merc. I/O, new steering, cuddy, full canvas, extras, fair/good, \$2,500. 751-6076.

18' GLASSCRAFT TRI HULL - 95 HP Merc., electric start, new seats. 2 tanks, tilt-trailer, \$2,500. Willie, Ext. 2333 or 732-3002.

13' SCAMP - fiberglass sailboat, 2-3 man, good cond., w/trailer, \$375. 475-3415 after 5 p.m.

LOCKING LUG NUTS - new 1/2" r.h., \$8. Paul, Ext. 4156.

23' CHRYSLER CABIN - fiberglass boat, 1968 twin Volvo engs., sleeps 4, extras, \$4,500. 399-3381.

25' LANCER - 1976, 2 sails, VHF, depth, am/fm, compass, sleeps 5, head, 7-1/2 Merc., valued at \$12,500, asking \$9,500. 273-6695.

19' FIBERGLASS CRUISERS INC. - w/90 HP Chrysler, trailer, many extras, excel. cond. 325-0447 after 6 p.m.

21' GALAXY - 1983, deep V cuddy cabin, 120 HP Volvo, 30 hrs., port-a-potty, am/fm cass., compass, depth, full swim platform, full canvas, like new, extras, \$8,900. Ext. 3589 or 281-3635.

18' STARCRAFT MARINER - 50 HP Mercury, Holclaw trailer, \$1,800. 286-1205.

ALUMINUM BOAT - trailer good for up to 17' boat, asking \$400. Walter, Ext. 4986 or 757-5478.

MUSHROOM ANCHOR - 100 lb., chain and pickup bouy, \$75. 369-0432.

19' GRADY - 1983, white, full canvas, 115 Evinrude, power trim/tilt, w/85 Cox E-Z Load trailer. John, Ext. 4668 or 324-0220.

79 OUTBOARD MOTOR - Mercury, excel. cond. Mario, Ext. 7148 or 363-2522 after 6 p.m.

26' PACEMAKER - 1968, Sport Fisherman, 318 cu. Chrysler, f/w cooled, 110V/12V RF, VHF, DF, recorder, excel. cond. Don, Ext. 5329 or 878-2215 after 6 p.m.

25' TROJAN - 1969, 200 HP Chrysler, VHF, depth scanner, \$5,500. 289-3316.

Miscellaneous

BEDROOM FURNITURE - Early American, queen size 4 poster bed, 2 night tables, men's dresser, triple dresser w/hutch, excel. cond. 924-7658 after 5 p.m.

DRYER - 110V, compact, excel. cond., \$100; end tables, \$25 ea.; Base CB, digital, 40 CH, \$50. Harry, Ext. 7578 or 744-2715.

POTTER'S WHEEL - cement kick wheel, like new, best offer; air conditioners, (2) 27,000 BTU, \$150, 50,000 BTU, \$175; (2) stainless Tappan gas ovens; (1) counter top gas stove. 758-6053 after 6 p.m.

LUGGAGE - 4 pc., blue, 26" & 22" suitcases, cosmetic case & matching tote bag, \$45. Marion, Ext. 2902 or 281-5667 after 6 p.m.

ARTLEY STUDENT FLUTE - custom solid silver head-joint, closed hose, C-foot, good cond., \$150. D. Hardy, Ext. 3389.

WEDDING GOWN - like new, lace bouffant, 4 tiers front, 6 back, size 10, pearls/sequins, \$60. Ext. 2733.

MOVING - chests; hi-riser; chairs; kitchen table; ironing board; lamps, much more, cheap. 929-4701.

GARDEN TRACTOR - Sears, 10 HP, 36" mower deck & 42" sweeper, like new, \$600. Al, Ext. 4615 or 751-8462 after 6 p.m.

WESTINGHOUSE FREEZER - upright, 10 cu. ft., 3 mos. old, under warranty, orig. cost \$400, sell for \$325. 281-0124.

GE REFRIGERATOR FREEZER - 13.5 cu. ft., self-defrosting in refrigerator, works well, \$110. Ext. 3222 or 3755.

DINING TABLE - solid dark pine, 4 heavy legs, 72" L x 20-1/2" W w/2 drop leaves, each 10" W, \$275. 722-4489.

BOOKS - classics, gardening, cookbooks, sociology, etc; house sale, contents must go, 2 antique chests, 3 & 4 drawer; (5) women's winter coats, size 12, suede, camel, all for \$50; Chevette spare tire & rim, brand new, \$25. 281-2002.

HOT TUB - self-contained, 74" x 67", filter, chemicals, evapor. cover, used indoors, 3 mos., excel., \$1,500. 751-6076.

ROWER/EXERCISER - DP Bodytone 300, assembled, almost new; jogging trampoline, 42" diameter. Jane, 473-0961.

TRESTLE TABLE - Ethan Allan, 70", 2 benches, 2 chairs, cushions; dry sink; curio shelf; twin bed; bureau. Gail, 979-9318.

FIREPLACE INSERT - Glacier Bay, airtight stove, excel. cond., \$595. Ext. 2705.

LIVE BUNNIES - for Easter, Dwarfs, gray, black, off-whites, \$20; pure white, regular size, \$10; brown fluffy, \$8. 924-4290 or 924-0697 will reserve for Easter w/deposit.

BATHROOM SINK - wall mount, good cond., (4) new tub enclosures, \$20 ea. Dave, Ext. 3093 or 281-0062.

MORSAN TENT - 7x7, like new, \$50. Ext. 4312.

DRUM SET - Tama, 5 pc., w/2 cymbals, hi hat, and all hardware. Herb, Ext. 3611.

PINE KITCHEN SET - w/mate's chairs and table leaf, very good cond., \$100. Ext. 2514 or 757-3178.

HIDE-A-BED - queen, \$60; desk, \$35; double bed, new, mat/box spring, great frame, \$100; fish tank; dog crate. Malinda, 928-8379.

ACOUSTICAL GUITAR - Goya (Martin), folk, 6 string, mint cond., \$100 neg.; Sears weight bench w/leg press, over 100 lbs. of weights, \$50. Joe, 744-5069.

BICYCLES - (2) 20" girls, w/banana seat, excel. cond., \$35 ea. Ext. 2980 or 289-0532 after 6 p.m.

POOL - aluminum frame work for 15' x 30' pool, plus filter, skimmer, motor/pump, \$375. Walt, Ext. 2907.

GAS COOK TOP - brand new, coppertone, elect. start, 4 burner, cost \$140, sell for \$90 firm. Howard, 878-8294.

POOL - 21' x 4', with new 1 hp motor and s/s filter, you dismantle, excel. cond., \$600. 475-6938.

13" B&W TV - \$25. Carol, Ext. 2907.

FLOOR POLISHER - Electrolux; assort. door knobs, new, \$15 for all; patio door hardware. Paul, Ext. 4156.

TABLE - butcher block, w/4 cane chairs. 399-4122.

MOVING MUST SELL - good 10 spd. bicycle, performance wind surfer. John, Ext. 5515 or 246-8293 or 744-1793 eves.

SHAG RUG - 14' x 26', orange and brown, good cond., \$75. 941-9352.

Car Pools

CALVERTON - rider, County Road 24, 8:30 to 5:00. Tom, Ext. 2314.

SHOREHAM - join or form car pool. Pete, Ext. 3297 or 821-9547.

PORT JEFFERSON/STONY BROOK - will ride or drive. Pierrick, Ext. 3464.

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

CORAM - Bretton Woods Townhouse, 3 bdrms., 2-1/2 baths, all appliances, in/outdoor swimming pool, golf course, bowling, tennis, health club, etc. \$1,100 plus util., avail. April 1, no pets. 331-4768.

LAKE PANAMOKA - new (1) bdrm. apt., private entrance, util. included, single preferred, \$400 monthly. 929-4877.

VERMONT HOUSE - reas. vacation, 3 bdrms. & 2 baths, f/p, fully equipped, woodland trails, alpine slide, golf, summer theater, boating, fishing, etc., family-oriented, avail. weekly. 732-6499 after 6 p.m.

MANORVILLE/CENTER MORICHES - small cottage for one person, May 15 thru Oct. 15, secluded area. Howard, 878-8294.

SHOREHAM - 4 bdrms., Colonial, l/r, d/r, den, f/p, carpeting, country kitchen, dishwasher, washer/dryer, 2-1/2 baths, garage, excel. location, avail. April, \$1,250 pays all. 744-8659.

YAPHANK - 4 bdrm. house, 1-1/2 baths, l/r, d/r, large kitchen, completely renovated, 10 min. from Lab. avail. April 15, \$800 month plus util. 924-4872.

LAKE RONKONKOMA - cottage, 1 bdrm., l/r, dining area, kitchen, mins. to SUNY Smithtown, 20 min. to Lab, \$475 includes elec./water. 588-1889.

PATCHOGUE - waterfront, 1 bdrm. apt., w/w, dishwasher, heat/ac incl., 20 min. to Lab. \$561 plus 2 months security. 289-8988 after 5 p.m.

WADING RIVER - 3 bdrms., high ranch, 2 baths, l/r, d/r, eik, sun deck, finished basement, 2 car garage, washer/dryer, dishwasher, one acre property, 10 min. to Lab, SWR school, avail. immed. Chyng, Ext. 4391/4396/4563 or 751-8224 after 6 p.m.

FARMINGVILLE - one bdrm. apt., \$500 includes all, plus cable. 732-2141, before 1 p.m.

For Sale

E. PATCHOGUE - S. Durkee La., large custom Cape Cod, beautiful 1/2 acre lot, walk to beach and marina, 4 bdrms., 1 w/kitchenette, 2 baths, study w/fireplace, full basement, attic, garage. S. Country School Dist., \$153,000. 289-9724.

BELLPORT VILLAGE - 4 bdrms., split level, 1-1/2 baths, den, d/r, l/r w/cathedral ceiling, deck, \$85,000. Ext. 3695 or 286-4028.

ST. THOMAS, U.S. VIRGIN ISLANDS - Timeshare unit, Bluebeards Castle. Ext. 5163 or 475-6964.

CORAM - Birchwood at Bretton Woods, 3 bdrm. condo, Dalton model, den, l/r, formal d/r, 1-1/2 baths, patio, gas heat, central a/c, like new, many extras, 1/2 block to clubhouse. Ext. 7338 or 324-7643.

SHOREHAM - center hall, Colonial layout, private beach, 4 bdrms., l/r, d/r, f/r w/fpl. study, \$215,000. 744-5709.

Free

COLOR TV - 19", needs one tube, you pick up. Ext. 3755.

MALE DOG - needs good home, owner moving. Ext. 2980 or 289-0532 after 6 p.m.

CAT - male, altered, friendly, needs loving person. John, Ext. 5515 or 246-8293 or 744-1793 eves.

ELECTRIC DRYER - 220V, you pick up. 821-0758, 6 to 8 p.m.

REFRIGERATOR - still works, non-frost free, you pick up. Ext. 2389.

Lost & Found

LOST - men's glasses, blue/grey frames. Karl, Ext. 2984 or 3051.

Wanted

CAMPBELLS SOUP LABELS - send to F. Chandler, Bldg. T-89, for St. Mary School, E. Islip.

BOY'S BICYCLE - 289-9724.

BABYSITTER - reliable woman needed, no house-cleaning, own transportation, 4 children, ages 7-12, 2:30-5:30 now until June, 10:00-5:30 summer months, \$3 per hr. 289-1861 after 5:30 p.m.

16-K RAM PACK - for Timex Sinclair #1000 computer, cheap, for a young boy. Pete, 286-2093.

TRAINS - Lionel, American Flyer, accessories, any cond., brings good price. Carole, Ext. 3362 or 924-4097 eves.

FOLDING BICYCLE - any cond. Walter, Ext. 4605.

PEOPLE - who are interested in Bible study and discussion, meets Wed. at noon. Pat, Ext. 3565 or Sherry, Ext. 2670.

AIR CONDITIONER - 8k-10k BTU, 110V. Pete, Ext. 4819.

BOY'S BICYCLE - Ext. 2104 or 928-3863.

PERSON TO SHARE HOUSE - 2 rooms to rent, \$250 month ea., nice area, Shirley, 5 mi. from Lab. Drew, Ext. 2957.

CAR BOOSTER SEATS - in good cond., for 4 yr. old, grandparents need two. 286-1214.

FILM EDITOR/SPLICER - super 8 mm. Ext. 2246.

MOPED - for high school senior to use going to school, good cond. Ext. 2981.

SEA KAYAK - touring. Don, 286-12