BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Spotlight on NSLS Research

X-Ray Microscopy

Doctors and dentists routinely use x-rays to examine their living patients. And it has been known for some time that x-rays would be equally useful for looking at smaller samples of biological materials, such as cells. But while technology has produced x-ray machines and radiographs, x-ray microscopes that could produce images with adequate clarity have been another story.

In theory, the x-ray microscope should have a resolution many times better than the optical microscope for examining natural biological specimens. Helping the technology catch up to the theory is the goal of a team from SUNY Stony Brook, now working at the National Synchrotron Light Source (NSLS). Led by physicist Janos Kirz, the team, which includes graduate students John Kenney and Harvey Rarback, as well as scientists from IBM and the NSLS, is developing an x-ray microscope capable of achieving this resolution.

The teardrop-shaped image shown above is a single-celled diatom, a type of alga similar to that found in a swimming pool. This image was produced on a color image processor, on which the various shades of white, black and gray shown here appear as different colors to show densities throughout the sample. Here, the lightest areas are the least dense and represent the fluid surrounding the diatom. The darker spots show the density of the absorbing material in the diatom and suggest its internal structure.

Although this is a team of physicists, their efforts are directed towards creating a tool for biologists. "We are trying to make this a convenient instrument for others to use," explained Rarback. "We think this instrument will be very useful for research at the NSLS."

The instrument is located at port U15 of the vacuum ultraviolet (VUV) ring, which emits a broad spectrum of radiation. To examine a specimen, the x-ray microscope uses only one wavelength, in the 15 to 45 angstrom soft x-ray range. This wavelength is selected by a monochromator designed by NSLS physicist Malcolm Howells. With admiration, Kenney called it, "the world's simplest monochromator."

The selected radiation is transported within a vacuum-sealed beamline to the experimental apparatus inside the team's hutch. Waiting for the soft x-ray beam is a thin sample of biological material positioned at the end of its path, but out of the harsh vacuum environment. The lack of vacuum is critical. "In an electron microscope the sample must be put in a bit of a vacuum," Kenney said. "This entails drying the sample, slicing it very thin so electrons can pass through it, then staining it. What you are really looking at in an electron microscope is the stain. But for x-ray microscopy, we can just put the sample in the beam. It must be thin, but not ultra-thin. And it can be alive and wet, living in its natural fluid environment."

Soft x-rays are not very penetrating and are easily stopped. The denser the material in their path, the less they will penetrate. Thus, the soft x-rays coming from the beamline are absorbed, in varying degrees, by the different elements in the sample. The sample is mechanically scanned through a submicron beam spot. A detector, located directly behind the sample, transmits intensity information to a computer.

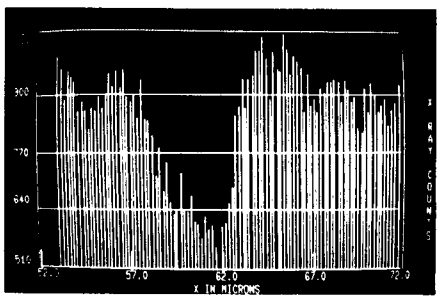
The computer can translate the information into different kinds of images. One is a conventional image showing the density of absorbing material in the sample. A color image processor allows the experimenters to assign different colors to different densities. The resulting image, while not in true color, gives an easily readable interpretation of densities throughout the sample. With this, said Kenney, "You can clearly start to see that x-rays bring out the internal structure in the specimen."

The second type of image is a cross-section of the sample depicting x-ray counts as a function of position along one scan line. Still under development is a process which involves making two scans at slightly different wavelengths above and below an x-ray absorption edge, which would produce an image locating a particular element in a biological cell.

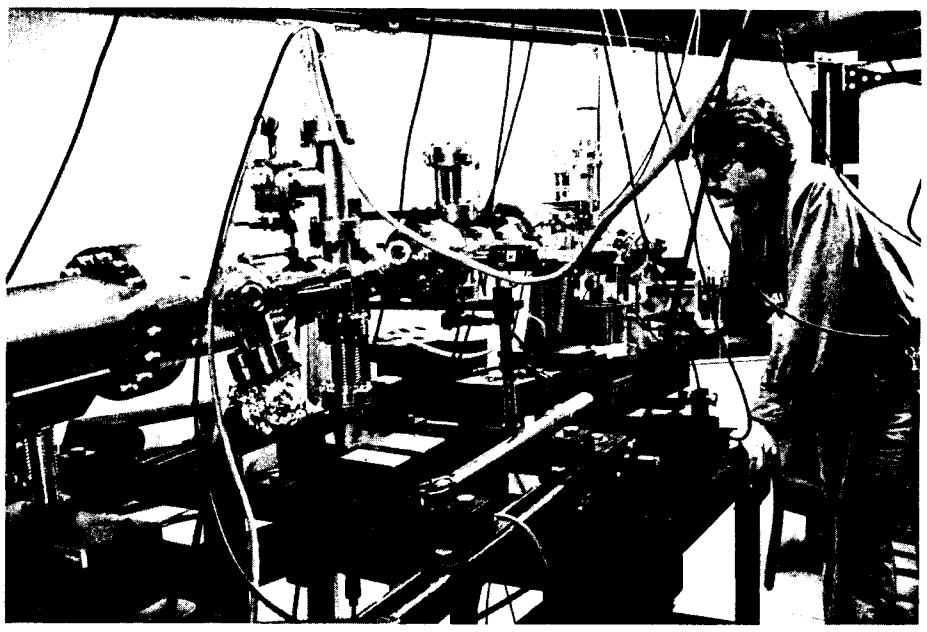
All the information that goes into these images is stored digitally in the computer's memory and can be recalled at any time.

The key to the resolution obtained in these images is a type of x-ray lens called a Fresnel zone plate built by IBM specifically for this research. Zone plate fabrication requires state-of-the-art technology similar to that used in the fabrication of the finest integrated circuits. By using diffraction, rather than refraction like ordinary lenses, the zone plate will ultimately be able to provide resolution

(Continued on page 3)



This histogram represents a cross-section of the image of the diatom. The graph depicts x-ray counts along one scan line and indicates how well the soft x-rays were able to penetrate the material along that line. Longer bars indicate more penetration. Since the scan line represented here is approximately midway through the image, the longer bars show the fluid surrounding the diatom. When the soft x-rays hit the diatom, they are absorbed in varying degrees, producing the shorter bars. The computer can produce histograms of any chosen line throughout the image.



Mort Rosen

At port U15 of the NSLS, John Kenney positions a sample in the x-ray microscope at the end of the beamline. The microscope is being developed by a SUNY Stony Brook team in collaboration with IBM and the NSLS.

Stainless Steel Corrodes Faster Than You Think

For the past six weeks, twelve graduate students from MIT have been working long hours on projects suggested by BNL scientists. They are participating in a unique internship program called the School of Chemical Engineering Practice.

The Practice School places students at various host laboratories or industrial sites, where they gain experience in applying fundamentals learned in the classroom. Here at BNL, one student team, with support from DOE's Office of Basic Energy Sciences, is studying corrosion in stainless steel.

While stainless steel can easily stand up to ordinary household use and is commonplace in corrosive environments, it can deteriorate. The corrosion rate depends on how harsh the environment and on how long the exposure.

Stainless steel is an alloy made of iron, chromium and nickel. It is resistant to uniform attack, but in a chloride environment (salt is sodium chloride), it will pit. And the pits can grow rapidly, wearing through a thin metal sheet in as little as a few days.

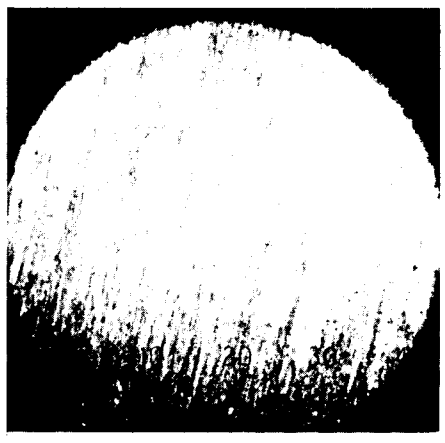
MIT students Gregory Gaudet, Thomas Mo and Jean Tilly have centered their project around a simple, but revealing experiment. They use a stainless steel wire embedded in epoxy to form an artifical pit. The wire is connected to a source of electrical current and put in a beaker of salt water. Left alone, the wire will corrode uniformly very slowly. With the application of voltage, the wire surface is activated and the corrosion rate speeds up.

That's not surprising. What is, however, is that if the voltage is suddenly lowered by about 400 to 500 millivolts, a drastic change takes place. Two distinct regions are observed on the wire surface — one continuing to corrode rapidly and the other corroding very slowly (passivated).

Seeking to explain how two different corrosion rates could occur under the same conditions, the students have repeated the experiment hundreds of times, at different pit depths, different applied voltages, and for different types of stainless steel. Here is their theory: When the wire corrodes, metal ions are produced at the wire surface. These ions then diffuse out of the pit and into the solution. Both the corrosion rate and the diffusion rate depend on the concentration of metal ions at the wire surface, and a stable system occurs only when the two rates are equal. A sudden drop in voltage triggers a difference between the rates of corrosion and diffusion, leading to the observed difference in corrosion rates.

For this project, the team has guidance from BNL scientists Hugh Isaacs and Roger Newman. The two had done previous work which suggested this peculiarity in the corrosion mechanisms of stainless steel.

The MIT students are adding to what is already known about corrosion in stainless steel. As a final goal of their BNL project, they are making a computer model of diffusion phenomena in pitting corrosion, using results of their experiments to refine the model so it predicts the corrosion rate more accurately.



Stainless steel wire, one millimeter in diameter, before the experiment.

After dropping voltage, stainless steel wire shows active and passive regions. The lighter upper section is corroding at a slow rate, and the darker lower section is corroding rapidly.

The Barrys of Beach Plum

The house would not have appealed to everyone. But the old gunning shack on the Fire Island shore of the Great South Bay had been a landmark for John (Jeb) Barry when he camped out on the barrier beach as a boy. As an adult, Barry saw the unused house just west of Old Inlet as a way to recapture the charms of those carefree days. So he and his wife Suzy looked into renting the place.

The owners of the house also turned out to be the owners of a small sailboat that Barry had found floating adrift on the bay a few years before and turned over to the police. Apologizing for their tardiness, the owners thanked the good Samaritan and offered a belated reward. Not only did the Barrys receive permission to use the house, they also summered there rent-free for a few years.

When they did start paying "rent," it was in the form of maintaining and improving the house and property and providing the owners with a winter's supply of firewood.

Not everyone would consider that a bargain. Though "The Beach Plum" sits on the water's edge, surrounded by those lovely fruit bushes, it lacks a few of the conventional amenities: electricity, plumbing, telephone, television. But "getting away from the telephone" is one of the things Barry likes most about this summer retreat. And with the next cluster of houses about three miles away, the Barrys can also entertain friends without worrying about the neighbors. "We enjoy seeing everyone come over here and have a good time," Barry says.

To show their appreciation, the Barrys' friends bring ice — a commodity that is hard to produce with a gas-powered refrigerator. Gas also runs the stove and the lights. Running water comes from a plastic line Barry has rigged from the house to the hand pump, located about halfway between the bay and the ocean. And there's an outhouse behind the main house.

The inconveniences don't bother Barry, who says, "If you don't have it, you just do without it." The Barrys have been doing without, and enjoying it immensely, for ten summers now. They live in the cabin from mid-June through Labor Day weekend, often renting their Brookhaven home out for the summer. Still, it's not all a vacation. Both Barrys work — he's a technician in DAS' Combustion Studies Group; she's a secretary for a local firm — and they try to use their vacation days to take long summer weekends. On their workdays, they commute — by boat.

A well-worn path marks the 800 feet from "The Beach Plum" to Fire Island's Atlantic Ocean shore where the kids enjoy a romp with Raven.

Visitors to "The Beach Plum" come by boat and tie up at the Barry's dock. Here to greet them are (front to back) Heather, Walter, Raven, Suzy, Heather's friend Melissa Kinsella and Jeb Barry.

The cruise to Squassux Landing in Brookhaven usually takes about 15 minutes in their 18-foot motorboat. On occasion, however, there is the weather to contend with. "Electric storms are the worst," Barry says. "I usually sit them out. And the fog in the morning can be terrible too, but I just use the compass and go." He has little choice. "I ride in a carpool most of the time, so I've got to be on time," he says.

The morning routine varies, depending on the children's plans. Sometimes Walter, 11, and Heather, 8, ride with Mom and Dad to spend the day with their grandmother in Brookhaven; other days, their grandmother joins them on Fire Island. The Barrys own a second 18-foot boat, a Boston whaler, which the children can operate in an emergency. And the grandmother can use the family's 4-wheel drive Jeep.

Generally, "the Jeep just sits there," says Barry, who has no wish to disturb the National Seashore on which the house sits. When the Federal government took over the area in 1964, the property was leased to the owners from whom the Barrys rent it. The owners' lease will expire in 1992, when the house will be razed and the area will be allowed to return to its natural state. Until then, the Barrys plan to continue enjoying the cottage, at least "until the kids get tired of it," Barry says. "So far they have really enjoyed it. Every week we bring one of their friends over. And we try to keep them motivated by planning lots of activities like water skiing, hiking and fishing." Also on the list is crabbing, in their 10-foot crabbing boat, and sailing, in the Barrys' Snark sailboat.

Their fleet comes in handy when the Barrys are coming or going for the summer — with their two dogs and about 60 Bantam chickens. "A red fox has gotten a couple of the hens this year," said Barry. "I saw him sitting on the dock, licking his chops." Other local inhabitants are "quite a few deer, lots of mosquitoes and plenty of poison ivy."

"You learn to live without some things and to live with others," said Barry. One of the things the family has learned to live with is the weather. "We've had some bad electrical storms here," said Barry. "Probably the worst was Hurricane Belle a few years ago. We left for the mainland and when we got back, everything was brown from the salt that blew over from the ocean. Even a 'normal' electrical storm can be scary. Some of the winds shake the house. It's just sitting on poles."

Soon the Barrys will leave the house to resume their winter schedule. But they'll head back for weekends throughout the year. And if the bay freezes over they'll want to check for damage by vandals, so they'll drive across the ice and park the car on the dock.

How does Barry account for this devotion to a house they don't own, a house without electricity, a house that will be no more in less than ten years? "We really love it," he says, "you have to — the running back and forth, repairing the boats, carting the food — we never thought we'd stick it out for ten years. It's a lot of work, but it's well worth it." — Anita Cohen

—photos by Humphrey

John Barry commutes to his summer retreat.

John Barry, at the other end of his commute - Bldg. 527.

Heather, Raven and Walter share a few quiet moments inside "The Beach Plum."

In Memoriam S.L. Commerford

Spencer Lewis Commerford, a Scientist in the Medical Research Center, died on August 28, at the age of 53.

A biochemist, Commerford's research centered on nucleic acid biochemistry. He came to the Lab in 1959 on an NIH postdoctoral fellowship, and joined the staff of the Medical Department in 1962. In 1982 he went to Germany on a year's sabbatical to work on studies of DNA damage and repair mechanisms at the Institute for Medicine, Kernforschungsanlage, Julich. In addition to his research, Commerford taught molecular biology and physiology to undergraduates in the Brookhaven Semester Program from 1968-81. He held a B.S. and M.S. in biochemistry from MIT and a Ph.D. in biochemistry from Harvard.

Commerford was a member of Sigma Xi, American Society of Biological Chemists, the Biophysical Society, the Harvey Society, and the American Society for the Advancement of Science.

He is survived by his wife, Alina, a son, Peter, and a daughter, Janine. He was a resident of Shirley.

Memo to Retirees

If they have not already done so, retired employees and their spouses who are nearing, or have reached, age 65, are reminded to apply for Medicare A & B coverage. The Laboratory's group medical insurance plan will not pay for any medical expenses which are payable under Medicare. Employees who are retired, or who are going to retire at age 65, should apply for coverage three months before their 65th birthday at the nearest Social Security office. District Social Security offices are located at 75 Oak St., Patchogue, and 518 E. Main St., Riverhead. When applying, take along proof of date of birth. For further information, call BNL Personnel Services at 282-2877.

Instrumentation Conference

The Third National Conference on Synchrotron Radiation Instrumentation will be held September 12-14 in Berkner Hall. For registration and program information, contact Judy Ferrero, Ext. 2145, or William Thomlinson, Ext. 3937.

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NSLS (Cont'd)

down to 500 angstroms — many times better than any optical microscope.

The experimenters have been at their job for about a year now, tuning and refining their equipment. While they have already achieved resolutions better than 3000 angstroms, they are still in the process of testing their microscope and learning how to use it best. "It's something that's going to take a long time before it can realize its full potential," said Kirz.

—Anita Cohen

Arrivals & Departures

Arrivals

Sujit Banerjee ..... S.&E.P.
Kathryn A. Hope ..... Nuclear Energy
Eugene A. Rosa ..... Nuclear Energy
Jay R. Winkler ..... Chemistry

Departures

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

Ad T. Aerts ..... Physics
Herbert J. Bernstein ..... Chemistry
Maureen Bohning ..... Mgt. Info. Sys.
Zvy Dubinsky ..... Energy & Env.
Franklin L. Leon ..... S.&E.P.
George R. Reisert ..... Plant Eng.

Low Fat Cheeses

Even if a package of cheese is labeled "skim milk," it may not be a low fat product, says the Cooperative Extension Association of Suffolk County. Cheese processors are free to add cream to skim, or part skim, milk products. Though the Federal Government sets guidelines as to the amount of fat and water that goes into each of 75 cheese varieties, Jarlsberg, farmer and pot cheeses are not legally defined in the goverment's regulations.

Aerobic Dance

Activity seems to be synonomous with summer, but for many people, it's the antonym for winter. If you want to change all that and continue your summertime level of exercise throughout the winter, the Aerobic Dance Club may have just the thing — a regular program of Aerobic Dance and/or Stretchercize.

All classes in the ten-week fall session begin in the North Room of the Brookhaven Center and run from 5:15 to 6:15 p.m. Registration will precede the first classes, which will be taught by Linda Sandberg. Full payment for each session is due at registration.

Aerobic Dance classes will meet on Tuesdays and Thursdays, beginning September 20. The fee for the 20-lesson session is $60. The ten-class Stretchercize session will meet on Wednesdays and will cost $30. The first class is scheduled for September 21.

Participation in the activities of the Aerobic Dance Club is open to any eligible BERA member age 18 or over. For more information call president Lizzy Soenarjati, 878-9520; secretary/treasurer Bonnie Wesolowski, Ext. 4301; or Linda Sandberg, 689-8740.

Sickle Cell Tests

September is National Sickle Cell Month. Lectures on sickle cell will be presented at Berkner Hall, Room B, on Wednesday, September 7, from 9 a.m. to 4:30 p.m., and on Thursday, September 8, from 12:30 p.m. to 4:30 p.m. The lecture takes about 30 minutes and will be repeated as groups form. Rosetta Greene, community health educator from the Long Island Sickle Cell Project, will be the speaker.

Free testing will also be available to interested persons. According to the Long Island Sickle Cell Project, sickle cell anemia is not detected in routine blood testing, and the disease is no longer limited to the black population.

For more information on screening, genetic counseling and other services, contact the Long Island Sickle Cell Project at 420-5026/5028, or 732-0400 Ext. 438/441.

Scholarship Alert

Up to ten 1984 AUI Trustee Scholarships will be awarded to children of regular employees of Brookhaven National Laboratory. Awarded competitively, the scholarships are renewable for up to four years of study toward an academic degree. In addition, up to three scholarships may be awarded to minority group children of employees of BNL and NRAO, who are Black, Hispanic, or Native American. Eligibility will be determined by applicable federal criteria.

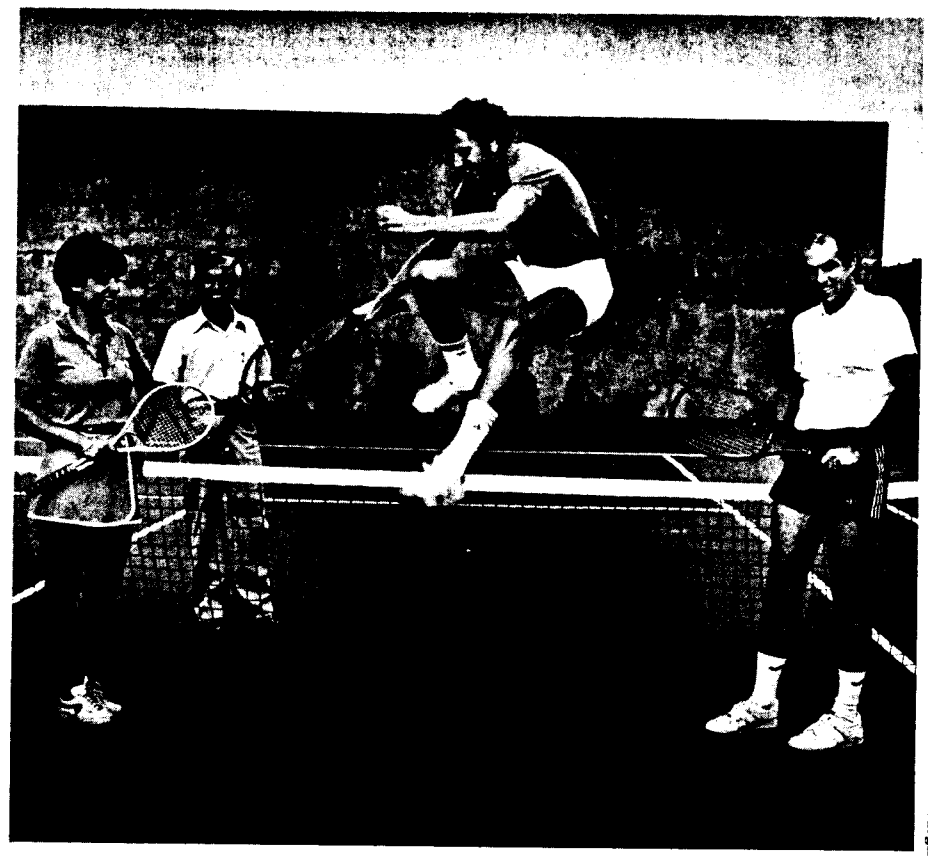
To qualify for a scholarship, the applicant must be a son or daughter of a BNL employee who began regular full-time, or regular eligible part-time employment no later than November 1, 1983, and who is employed by BNL at the time the award is announced. Also eligible are the sons and daughters of retired employees or employees who died when in regular service at the Laboratory. In the case of stepchildren, eligibility will be established if the employee regularly claims the child as a dependent for income tax purposes.

Eligible applicants must be secondary school seniors who will graduate during the current academic year and enter college by the fall of 1984.

Each scholarship will be in the amount of $1,700 per year and is paid directly to the college.

Applications are due November 1, 1983. For more information, application forms and critical date schedules, contact the Office of Scientific Personnel (OSP), 40 Brookhaven Ave., Ext. 3338.

OSP also has available a recent issue of The Chronicle of Higher Education. This publication carries a listing of tuition and fees payable in 1983-84 at more than 2600 post-secondary institutions (including additional tuition payable at state schools for out-of-state students).



Roger R. Stoutenburgh

Urged on by fellow champs of the 1983 BNL tennis tournament, Tom Koetzle obliged the photographer with a jump over the net. Koetzle was the winner in men's singles. Other winners were: Chris Saitta (left) in women's singles, Saitta and Mary Lou Abata in women's doubles, Louise Herrera and Steve Shapiro (right) in mixed doubles, and Darrel Joel and Junichi Iwai (second from left) in men's doubles.

Food Service

At the Cafeteria, the snack bar will be open from 9 a.m. to 2 p.m. on Saturday, Sunday and Monday, September 3, 4 and 5.

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

The vended food service in Bulding 912 will be in operation throughout the Labor Day weekend.

Att: Philatelists

The on-site Post Office has a few mint sets from 1978 and 1979 on sale at the original prices of $4.50 and $5.25. These stamps will only be on sale until September 30 after which time they will be destroyed.

Hospitality News

The Hospitality Committee's next monthly morning get-together will be held Tuesday, September 6 from 9:30 to 11:30 a.m. at the Brookhaven Center. Annette Meyer, the guest speaker, will demonstrate some of the various ways macrame can be used.

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

Bowling

It's time to dust off the old bowling ball or purchase a new one. The 1983/84 bowling season will begin on Tuesday, September 13 for the leagues in Port Jefferson (6 p.m.) and Thursday, September 15 for the mixed leagues in Shirley (6:30 p.m.).

Islanders Games

Tickets for the New York Islanders pre-season hockey games are now on sale at the BERA Sales Office in Berkner Hall. The Champs will be playing Buffalo on Tuesday, September 20; Philadelphia on Saturday, September 24; Boston on Tuesday, September 27; and the Rangers on Thursday, September 29.

BERA has eight tickets for each game and is offering to sell them to on-site employees at a two-for-one price of $17.50.

The sale of regular season tickets will be announced in the Bulletin before October 1.

Cafeteria Menu

Week Ending September 9, 1983

Monday, September 5
Snack Bar Service
9 a.m. to 2 p.m.

Tuesday, September 6

Chicken and rice soup	(cup)	.65
	(bowl)	.75
Filet of sole doré & 1 veg.		1.90
Baked lasagna & 1 veg. w/garlic bread		1.95
Hot Deli: Texas jumbo chili & cheese dog		1.90

Wednesday, September 7

Old fashioned bean soup	(cup)	.65
	(bowl)	.75
Veal chasseur & 1 veg.		1.95
Spinach crepes w/cheese sauce & 1 veg.		1.85
Hot Deli: Swedish meatball hero		1.95

Thursday, September 8

Minestrone Soup	(cup)	.65
	(bowl)	.75
Baked meatloaf & 1 veg.		1.85
Tuna noodle casserole & 1 veg.		1.85
Hot Deli: Corned beef	(bread)	1.85
	(roll)	2.00

Friday, September 9

Manhattan clam chowder	(cup)	.65
	(bowl)	.75
Old fashioned beef stew on egg noodles		1.95
Macaroni & cheese w/1 veg.		1.80
Hot Deli: Top round of beef w/green peppers	(bread)	1.95
	(roll)	2.10

House Open to Public September 11

Since its dedication on September 10, 1980, the Brookhaven House has been open to visitors at least once a year during the Lab's summer Sunday tour program. Over 7500 people have already taken this opportunity to inspect the energy-efficient solar home located on the corner of Upton Road and Mitchell Lane. And more will have the chance on Sunday, September 11, when free tours of the Brookhaven House will be offered from 10 a.m. to 3 p.m.

A number of different energy-conserving concepts are utilized in the Brookhaven House, resulting in heating costs which are a fraction of those encountered in typical homes. Such features as south-facing windows, house siting and a heat storage system contribute to this performance. The house can be heated throughout an average Long Island winter using only about 170 gallons of oil.

No complex technology was involved in the houses's construction and only readily available building materials were used. The construction of the house, from initial planning through completion, was documented in the award-winning film "Building the Brookhaven House," which will also be shown on September 11.

The Sunday tour program will continue until the end of September *except on September 4.* The tours include slide shows, a guided tour of the Lab site and a guided walking tour of the three-story Exhibit Center.

Softball

Final Standings

League I

	Won	Lost
Blue Jays	11	3
Ravens	10	4
Six Pax	10	4
Phoubars	9	5
AMD	6	8
Ice Pops	5	9
Big Sticks	3	11
Moles	2	12

League II

Roga	12	2
Magnuts	10	4
Medical	8	6
Titans	8	6
Lights Out	6	8
Dirty Sox	5	9
Light Source	5	9
Random Errors	2	12

Scores for week of August 15

League I

Six Pax 10 - Blue Jays 9
Phoubars 15 - Big Sticks 3
Ice Pops 23 - Moles 22
AMD 11 - Ravens 9

Makeup game:

Blue Jays 14 - Moles 0

League II

Dirty Sox 5 - Medical 0
Lights Out 11 - Light Source 8
Magnuts (won) - Random Errors (lost)
Roga (won) - Titans (lost)

League III

Survivors 11 - Nads 8
No Names 4 - E-Z Riders 3
TNT (won) - Mole-Esters (lost)

League IV

No Feedback 23 - Spacekadets 13
The Source 18 - Underalls 1
Turkeys 17 - Who's on First 11
Random Sample 8 - Mudville Sluggers 7
Septembers 17 - Who Cares 16

Scores for week of August 22

League I

Blue Jays 25 - Ice Pops 3
Six Pax 28 - Moles 8
Ravens 8 - Phoubars 6
AMD 24 - Big Sticks 10

League II

Magnuts 17 - Dirty Sox 9
Titans 13 - Lights Out 6
Light Source 21 - Roga 16
Medical (won) - Random Errors (lost)

League III

E-Z Riders 17 - Mole-Esters 10
TNT 10 - Nads 6
Survivors (won) - No Names (lost)

League IV

Mudville Sluggers 13 - Septembers 12
Spacekadets 20 - Who's On First 10
Underalls 7 - Turkeys 3
The Source 6 - Random Sample 3
Who Cares 14 - No Feedback 7

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.

SCIENTIFIC POSITIONS OPEN: The following staff positions are open. Candidates may apply directly to the department representative named, or through the office of Scientific Personnel, Ext. 3338.

STAFF SCIENTIST - Seek Ph.D. scientist with interests in X-ray and VUV instrumentation, facility operations, and research. Contact: William C. Thomlinson, National Synchrotron Light Source Department, Ext. 3937.

LABORATORY RECRUITMENT: Opportunities for present Laboratory employees.

1932. SECRETARIAL POSITION - Requires AAS degree in secretarial science or equivalent and excellent communication and clerical skills. Will be responsible for all phases of office procedures including word processing and shorthand. Familiarity with data processing terminology helpful. Management Information Systems Division.

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

1933. TECHNICAL POSITION - Requires AAS degree in electrical technology or equivalent and background in high voltage, high power, rf, analog and digital circuits and controls. Will work at 200 MeV Linac. Accelerator Department.

1934. SCIENTIFIC ASSOCIATE - Requires BS or MS in a physical science. Individual will provide support on experimental beam line and operation. Work will involve preparation of operations manual, scheduling work, software development, and interacting with outside beam line users. National Synchrotron Light Source Department.

Autos & Auto Supplies

77 CHEVY VEGA - $1,900. 654-0830 after 6 p.m.

83 BUICK SKYHAWK - $8,300. Ext. 5138 or 473-5095 after 9 p.m.

79 HORIZON TC3 HATCHBACK - $3,500. 924-5689 after 5 p.m.

79 CHEVETTE - $1,995. 473-2473.

67 VW BEETLE - 286-9158.

76 BEAUVILLE CHEVY VAN - $4,000. 689-8793 or 732-5445.

76 DATSUN 280Z - $4,695. 473-1157 after 6 p.m.

82 CHEVY C-10 PICK-UP - $7,900. Ext. 4026 or 744-8567.

74 PINTO - $230. 751-5868 after 6 p.m.

80 SUZUKI MOTORCYCLE - 400 cc, $995. Kinney, Ext. 4316 or 924-4536.

79 FORD FAIRMONT FUTURA - $3,000. 399-5316.

72 CHEVY NOVA - $400. Liz, Ext 2082 or 286-8563.

77 GRANADA - $2,750 or best offer. Lou, 283-6338 eves.

73 FORD MAVERICK - $1,300. Ext. 4846 or 363-6940.

73 DATSUN HATCHBACK - $700. 878-4285 after 5:30 p.m.

74 AUDI FOX - Ext. 4976 or 929-3061.

69 RAMBLER AMERICAN - $300. Ext. 3082.

78 YAMAHA SPECIAL - 750cc, $1,600. 289-2864.

VW PARTS - brand new, call for needs. Augie, Ext. 2419 or 289-4211 eves.

79 MG MIDGET - $3,400. 878-0201.

60 VALIANT - $150. Ext. 3870 or 281-0152.

75 HONDA CVCC WAGON - $1,175. 289-9074 eves.

70 OLDS CUTLASS SUPREME - $650. 351-1017 after 7 p.m.

81 CHEVY MALIBU CLASSIC - $6,100. Ext. 5294.

70 AMC - $350. Ted, Ext. 4163 or 286-0065.

69 VW BEETLE - $300. Ext. 4587 or 929-8443.

70 KARMAN GHIA - $1,000. 286-1618.

74 GREMLIN - $350. Ext. 4495.

77 MALIBU WAGON - $2,350. Harry, Ext. 3080 or 282-3096 eves.

76 BUICK CENTURY WAGON - $1,900. 581-7656.

75 HONDA MOTORCYCLE - CB400F, $775. 981-7054 between 7-10 p.m.

78 HONDA MOTORCYCLE - 550, $975. 981-7054 between 7-10 p.m.

71 LEMANS - $700. 369-2844.

75 PLYMOUTH VALIANT CUSTOM - Ext. 4134.

TIRE - 15" mounted on new '78 Buick Regal rim, $25. Sue Ext. 7235 or 399-1736 after 5 p.m.

51 FORD TRACTOR - $2,500. Hugh, Ext. 4424 or 924-3293.

69 DUCATI MOTORCYCLE - 350cc, $195. Hugh, Ext. 4424 or 924-3293.

81 DATSUN 210 - $4,200. Lloyd, Ext. 3381 or 286-1024 after 6 p.m.

Boats & Marine Supplies

ANCHOR - folding 40 lb. for 20 ft. and up, $35. Albert, Ext. 4612.

BOAT & TRAILER - 40 HP motor, must sell. Al, 941-9442.

17' WELLCRAFT - fiberglass, 85 Johnson outboard motor, fully canvased, CB, depth finder, trailer, like new, $2,500. 234-7225.

27' CRUISER - inboard Chrysler V/8, canvas back, sleeps four, extras. 289-1754.

GRADY WHITE - 204C overnighter, 200 HP Johnson, VHF, many extras, $8,000. 654-0050 after 6 p.m.

SEARS OUTBOARD ENGINE - 7 HP, few hours, needs clutch repair, $175. 588-3957.

21' STARCRAFT - 1973 Cruiser Chiefton, aluminum hull, full cabin w/sink, 115 HP Evinrude, $3,700. Rolf, Ext. 4238 or 286-1974.

15' FIBERGLASS BOAT - with electric start, 40 HP Johnson, compass, and trailer, $700. 878-4285 after 5:30 p.m.

14' APOLLO SAILBOAT - fiberglass, main and jib sails, seats four, trailer, $700. 878-4285 after 5:30 p.m.

TRI HULL - 1981, w/65 HP Mercury, all access. included, $2,000. 399-5316.

ROW BOAT - $50; mushroom anchor, 150 lb. w/50 ft. of chain, $100. Jerry, Ext. 2934 or 744-2816.

WINDSURFER - Starboard + 2 sails, $550. 475-4428.

26' DODGE - wood hull, fully equipped, extras, 105 HP, excel. cond., sleeps 4, $4,200. 286-1192.

INBOARD ENGINE - Chysler, 400 c.i., running, will demonstrate, $300. Bob, Ext. 4220 or 286-8770.

16' FIBERGLASS RUNABOUT - $50; with excel. 40 HP engine, $325. Ed, Ext. 4188 or 363-5170.

Yard Sales

LAKE PANAMOKA - 3 families, corner Wyandanch & Wauwepex, Saturday, Sept. 3, 9 to 5 p.m.

MIDDLE ISLAND - 4 yard sales, Sept. 3-5,, something for everyone, Woodville Rd.

BELLPORT - Sat. Sept. 3, 9-6, 759 Doane Ave., something for everyone.

Miscellaneous

PROPANE GRILLS - excellent cond., one single, $50; one double, $70; 19 inch B/W Zenith TV, $125. 929-3127.

GERMAN VIOLIN - 3/4 size by Schrotter, w/bow & case, good tone & condition, $150. R. Kehl, 744-9861.

ANTIQUE BICYCLES - man's and ladies, 26 x 2.125 w/w tires, $40/ea. 727-4363.

LIVING ROOM - 3 piece set, French, 40 years old, intricate unusual handcarved frames. 281-6699.

DISC CAMERA - Kodak 6000, new (used once), $45. Nancy, 281-6699.

MARBLE TOP TABLES - Baraque gold laquered bases, (1) oval, (2) round. 281-6699.

50 GAL. DRUM - for storage of oil or kerosene, $5. Helga, Ext. 2384.

FARM STAND - pick your own, Tues.-Sun., Manorville. 878-2595 or 924-5446.

MINI BIKE - small, 5 HP Tecumseh engine; Schwin BMX Scrambler, good condition, $125/ea. Chris, 585-4038.

WROUGHT IRON RAILINGS - (2), heavy duty, fancy twisted Balustrade, 3 step 4' stoop. 744-3792.

CHEMICAL GLASSWARE - flasks, volumetrics, erlenmeyers, boiling, test tubes, condensers, separator, funnels, etc., $300. 473-7009.

VACUUM - Sears Kenmore Upright, like new, $45. Ext. 4547.

DINETTE TABLE & CHAIRS - maple finish, (4) captains chairs, excellent condition, $150. Richie, Ext. 2175 or 734-7342.

STEREO - Quadraphonic AM/FM, multiplex 8-track auto. changer, FM needs work, $100 or best offer. Ext. 4985.

FREEZER - 20 cu. ft., excellent condition, $100 or best offer. Rosemary, Ext. 3480.

TODDLER CAR SEAT - $6; Porta-crib (wood), $20; infant feeder, $1; Brownie movie camera, $2.00 & more. 293-7368.

DEHYDRATOR - for preserving and drying fruits and vegetables; quartz heater, new; (2) tennis racquets. Zvi, Ext. 4886.

ORIENTAL RUG - 9x12, beige and blue, $225. 475-8952.

ORGAN - very old, Estey pump, make offer; stove, very old, kerosene gas. Fred, Ext. 7947, 4823 or 588-2268.

ANTIQUE TRUNK - w/brass fittings, great shape, $45. 475-2090 eves.

INSULATION - used, 3-1/2"x15" over 700 sq. ft., $50; 20" boy's bike, $20. 732-3105.

BEE HIVES - with bees & queen, 2 deep supers, $50/ea.; 6 lbs. honey, $9/ea.; wood, $95/cord. Hugh, Ext. 4424 or 924-3293.

BOY'S SUIT - 3 pc., navy, excel. cond., $18. Sue, Ext. 7235 or 399-1736 after 5 p.m.

HIDE-A-BED - double, 72" long inner spring, $100; electric typewriter w/table, full size, $75. 289-0526.

ELECTRIC DRYER - 15 yrs. old, runs well, new bears & belt, $25. Roy, Ext. 4664 or 744-8779.

MINI BIKE - Rupp, 4 hp Tecumuh engine, not running, $50; girl scout uniform, size 10-12, $12. 581-7656.

OIL FURNACE - motorized flue damper valve, cost $225, will sell for $99 plus full instructions. Jack, Ext. 3085.

REFRIGERATOR - Frigidaire, 19 cu. ft., $190; modern walnut hutch, $100; cast iron radiator, $20. Ron, Ext. 7696 or 289-1003.

SCREEN PROJECTION - home movie slide type, good cond., $10. Victor, Ext. 2395.

MATTRESS - queen size w/box spring & frame, Simmons Beautyrest (super firm), $90. Ext. 3947 or 475-3431.

CAMPING EQUIPMENT - North Face 2-man backpacking tent, $75; Camptrails backpacks, $25/ea., stove & more. 929-8662.

ANTIQUE DRESSER - walnut, 4 drawers w/mirror, very good cond. Walt, Ext. 7154 or 754-1392 eves.

BABY CLOTHES - & furniture, like new. Billie, 286-3718.

B/W TV - Sears, 24" solid state, $45. Maggie, 744-4787.

PORTABLE 8 TRACK STEREO - Panasonic, hand carry; quart canning jars, glass tops. Ext. 2950.

BEDS - mattress, box spring & frame: queen, $55; single, $30; single headboard, $15. Ext. 3600 or 289-8182.

SKI BOOTS - men's 8-1/2c, Solomon SX90, used 2 weeks, $135; men's ski pants, 34R, never worn, $75. Ext. 4727.

YOUTH BEDS - (2) 34"x67" spring, good cond., $25/ea. Ext. 3371.

CHAIR - Lazyboy, slightly used, pale green, $90; white sofa, $20. 289-1430 after 5 p.m.

SKI BOOTS - Nordica, size 8, with GK03 Austrian skii's and Solomon bindings, $100 takes all. 286-1062.

MINK COAT - Victorian furniture, china, cut glass, barbell set, lamps, hand made afghans. 472-0509.

B/W TV - 13" good cond., $25 incl. photofact. Ext. 4240 or 286-0295.

COFFEE TABLE - rectangular shape, good cond., $20. 589-4218.

WELL PUMP ROD RECIP - 1/2 HP motor, Fairbanks Morse, good cond., $75. 473-9323.

ANTENNAS - Wilson tribander, $50; Radio Shack V-185 TV antenna, $50. 744-9677.

PICTURE WINDOW - 3'9"x8'9", alum. triple track, includes screens, storms, & frames, alum. & wood, $50. Lew, Ext. 5193.

DETECTO SCALE - new, $10; meat board well, new, $9; (2) pool/bath towels, $4/ea. Tim Malloy, 289-6490.

BEDROOM SET - 6 pc., $375; living rm. set, $150; dinette set, $150; kerosene heater, more. 281-4397.

BASF BLANK CASSETTE TAPES - C-90, CrO_2, $2.75/ea. Ext. 2521.

SLEEPING BAG - Bristlecone, used twice, sub zero 3 season use, hollofil insulation, $100. Rob, 928-1209.

GIRL'S BIKE - 3 spd., banana seat, hand brakes, $20. Ext. 3130.

Free

KITTENS - (6), just weaned, can eat by themselves. George, 281-3939.

PUPPY - trained stray, great with children, very faithful and adorable. Ext. 4512

DOG - terrier mix, female, spayed, 2 yrs. old, housebroken, current shots, ideal adults. Irene, 286-3622.

Real Estate

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

For Sale

STONY BROOK - luxurious 5 bdrm., 3 bath, farm ranch, walk to SUNY, oversized recreation room, cen. a/c, s/s, w/w, 2-1/2 car gar., 3,000+ sq. ft. on lovely 1/2 acre, ideal mother-daughter. 751-2030.

POINCIANA GARDENS - property in South Stuart Florida, 140 x 125, $6,000 willing to negotiate. 289-8428.

BROOKHAVEN HAMLET - custom 4 bdrm., 2 car gar., 1.25 acres w/privacy, wooded and open areas, walk to schools, new city water, efficient and in excellent condition, $125,000. 286-0436.

SO. SHIRLEY - 3 bdrm. ranch, eat-in kitchen, dining room, large living rm., new kitchen floor, all w/w carpet, basement and garage, $46,000. 399-5316.

RIDGE - one acre wooded plot, 100 x 400, on quiet established street, $13,900. 924-3236.

For Rent

CENTER MORICHES - 3-1/2 lg. apt., 1 bdrm., full bath, carpet, refrigerator, own zone heating, cable, no children, must see, 1 mo. security, available Oct. 1, $500/mo. pays all. 878-0480 eves.

BAYPORT - 4 bdrm. ranch, 2 full baths, brkfst. rm., den w/fireplace, fin. basement, attached garage, $850/mo. util. not incl. Gene, Ext. 5293.

BELLPORT VILLAGE - 3 bdrm., living room, dining rm., kitchen, built-in pool, 10 miles from Lab., 2 mos. security, $600/mo. plus utilities. 286-8437, before 2:00 p.m. or after 7:00 p.m.

STONY BROOK - 3 bdrm. furnished colonial house, from Nov. 13 to Dec. 31, 1983, transportation to Lab. Jag, Ext. 5080 or 751-1884.

SOUND BEACH - 2 bdrm. cottage w/basement, hugh yard, quiet neighborhood, $450/mo. 473-8768.

SETAUKET - Old Field South, mint, charming Victorian Colonial, 3 bdrm., energy efficient, large property, $850/mo. plus utilities. 751-9096.

SETAUKET - excellent Bracken-built Colonial, 5 bdrm., lr, fr, dr, eik, 2 car garage, full bsmt., 3/3 acre w/perfect privacy, $1,100/mo. (flexible) plus utilities. 751-9096.

Car Pools

QUEENS - form or join existing car pool. Ext. 3606.

NORTH SMITHTOWN - would like to start car pool or join existing one. Ext. 2145.

BNL - to Stony Brook University, Mon.-Wed., Fri. mornings. Ning, Ext. 4504.

RONKONKOMA - driver to join 3 person pool, LIE exit 59, 8:30-5. Victor, Ext. 2395.

NORTHPORT/FORT SALONGA - need 4th person for on-time car pool, 8:30-5. Walter, Ext. 3354.

HUNTINGTON STATION/MELVILLE - 1 person needed for existing 3 person car pool. Meyer, Ext. 3036.

Lost and Found

LOST - child's softball glove, vicinity field 1, Aug. 15th. Ann, Ext. 2114.

Wanted

HOUSE TO RENT - 2 bdrm., between Brookhaven Hamlets and Patchogue, for October 1st or earlier. Morgan, 289-1244.

TAPE RECORDER - reasonable, working, large cheap bird cage. Liz, Ext. 2082 or 286-8563.

GAS TANK SENDER - for 1968-1970 Volvo. John, Ext. 3277.

KARATE OUTFIT - for 10 yr. old, size 12 dress; stereo for teenager; wood coffee/end tables. Pat, 282-3319 or 281-2289.

WEIGHT BENCH - w/leg lift, reasonable. D. Wayne, Ext. 4100 or 654-2076 eves.

AEROBICS EXERCISE PEOPLE - video cassette instructions. Doug, Ext. 2382.

CHILD CARE NEEDED - now 2 days per wk., after school begins, 4 afternoons, Apt. 4B. Ext. 3130.

FIELD HOCKEY STICK - good condition. Alison, Ext. 3986.

OLD BICYCLE PARTS - to practice working on & experiment with. Ext. 4030 or 878-2484.

CONVERTIBLE SOFA - suitable for home office. Ext. 3420.

HOLDING TANK - for well system, 40 gals. or larger; bathroom vanity, no sink or top needed, 24" wide. Bill Sanchez, Ext. 3848 or 281-6498.

TO RENT - retired couple needs furnished place, Sept. 5-12 (approx.). Ext. 4192 or 751-7787.

HOUSEMATE - share house near Wading River beach, l/r, fireplace, $175/mo. plus util. Ext. 4965.

HOUSE SITTER - last 3 weeks of September. Ext. 4373.

BUNKBEDS - no mattresses needed, boy's or teen-age style, sturdy please. Gerry VanDerLaske, Ext. 7527 or 399-4929.

Ads for Services may be posted at the BERA Sales office.

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