BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Big Success With Small Machine

Main Goals Achieved With Phase I Compact Synchrotron

A team at the National Synchrotron Light Source (NSLS) has attained all of the major commissioning milestones of Phase I of a two-phase project to develop the first compact, made-in-the-U.S., superconducting x-ray lithography source (SXLS).

But the team is not resting on these accomplishments: They continue to test the limits of the Phase I prototype — a compact synchrotron with conventional or "warm" magnets, even as they await the arrival of the two "cold" or superconducting dipole magnets, the completion of a dedicated linear accelerator injector and the construction of a new building for the Phase II prototype.

"The primary goals of Phase I of the project have been achieved," said Project Physicist James Murphy, NSLS. "We have certified the optics of the machine, exceeded our design current by a factor of two, injected the machine at energies of 80 to 200 million electron volts [MeV], and we have adapted a new computer control system. Work will continue on the Phase I ring to ascertain the limits on the stored currents and to improve the injection rate at energies below 200 MeV."

In addition to Murphy, the SXLS commissioning team includes Project Head and NSLS Physicist Richard Heese; NSLS Physicists Eva Bozoki and Stephen Kramer; NSLS Technical Specialist Thomas Romano; and Physicist Jay Krishnaswamy of Grumman Aerospace Corporation.

Grumman and General Dynamics are BNL's industrial partners in this project, a major goal of which is to transfer the SXLS technology to American industry.

Industry is interested in building compact synchrotrons to do x-ray lithography — a technique for producing supercomputer chips with device sizes of 0.25 microns or less. Such minute circuit sizes would permit the development of denser and more intricate computer chips and thus faster computers with much larger memories. This technique requires intense light of the right wavelength — and a synchrotron happens to be an ideal source of that light.

Most sources of synchrotron light right now are medium-sized, ring-shaped accelerators — perhaps about 50 meters or more in circumference. But, by developing compact synchrotrons under 10 meters around — small, practical, inexpensive and reliable enough for the semiconductor industry to employ with ease — countries such as Japan and Germany have been racing to be the first to dominate x-ray lithography source technology. And, by purchasing such sources internationally, corporations such as IBM are competing to be the first to mass produce chips using x-ray lithography.

Members of the commissioning team for Phase I of the superconducting x-ray lithography source: (clockwise from bottom) Project Head Richard Heese, Eva Bozoki, James Murphy, Jay Krishnaswamy, Thomas Romano and Stephen Kramer.

The U.S. entered into the compact synchrotron race in March 1988, by asking the accelerator physicists at the NSLS, through grants from the Department of Defense, to build the SXLS — an 8.5-meter-in-circumference source for the 10-angstrom, soft x-ray light ideal for proximity-printing chip lithography.

To build the SXLS, this NSLS team has taken a two-phase approach.

During the present Phase I, after a warm-magnet version was designed and built behind the shielding wall of the NSLS x-ray ring, the SXLS project team surpassed three significant commissioning milestones: Electron beam was first stored in the warm-magnet ring last October; the ring achieved its design current of 500 milliamperes, carried in six electron bunches, in December 1990; and in February of this year, stored currents in excess of one ampere were achieved at the 200 MeV injection energy, using the existing NSLS injection system.

Though the electrons in the Phase I prototype are bent by warm magnets, the size, design current and injection energy are the same as those for the superconducting version. Also, many of the components from Phase I will be used in Phase II construction. So the successes of Phase I give the project team strong confidence as it prepares to enter Phase II.

"The success of the Phase I commissioning is a result of a tremendous effort by many talented people in the various groups at the NSLS: accelerator physics, vacuum, controls & diagnostics, RF and electrical engineering, mechanical engineering and operations," said Heese. "We have established a firm foundation on which to build Phase II of the project."

Employees' ALARA Suggestions Welcomed by ESP

Two of the Lab's improvement programs are joining forces: The Employee Suggestion Program (ESP) has been expanded to accept suggestions regarding the Lab's radiation protection program known as ALARA, the acronym for As Low As Reasonably Achievable.

The ESP was established in 1980 as way of rewarding employees when their cost-cutting and safety promoting ideas are implemented by the Lab. "It seemed natural to extend the program to include ALARA's goal of maintaining the lowest possible radiation exposure levels for Lab workers and visitors," said Suggestion Program Administrator Susan Foster, Personnel Division.

Kathleen McIntyre, a health physicist in the Safety & Environmental Protection Division, concurred. "By combining the two efforts," she said, "we hope that suggestions will be provided that can advance ALARA's reduction goal and enhance its training and implementation projects.

"While awards cannot be given for suggestions within the scope of employees' normal duties, responsibilities or authority, we do have a lot of people working in the field who come in contact with radiation-control practices, and their expertise is very valuable for ALARA's success," McIntyre added. "Textbook training is OK, but on-the-job experience really drives home what works and what doesn't."

(continued on page 2)

Susan Foster (left) and Kathleen McIntyre welcome ALARA suggestions to the Employee Suggestion Program.

A Little Planning Goes a Long Way — When It Comes to Hazardous Waste

Shown with hazardous waste that has been prepared for shipment in proper containers are: (clockwise from left) Peter Kwaschyn, Michael Clancy and George Goode, all of the Safety & Environmental Protection Division.

Photos in this issue by Roger Stoutenburgh

In response to increasing environmental awareness and regulatory requirements, BNL has become more and more vigilant in its approach to waste minimization — keeping the chemical and radioactive waste produced at the Lab to an absolute minimum.

Oversight of this serious effort is the responsibility of George Goode, Project Engineer for the Safety & Environmental Protection (S&EP) Division's Regulation and Minimization Group. He explained that potential health hazards, liability and skyrocketing disposal and cleanup costs all make waste minimization very important. "Processes that generate waste need to be evaluated for waste minimization potential," said Goode. "Reducing the quantity and toxicity of wastes generated pays off in many ways."

For example, consider the solvent trichloroethane (TCA), which is widely used at BNL due to its low flammability and excellent degreasing properties: Recent changes in federal and state regulations make TCA a good target for waste minimization. A single gallon of TCA can contaminate approximately 200 million gallons of water to the level of the New York State drinking water standard.

"While normal disposal methods for TCA run about $450 per 55 gallons,

(continued on page 2)

Employees in the Winners' Circle

These BNLers recently received awards for suggestions submitted to the Employee Suggestion Program (ESP). If you are an employee with a bright idea for enhancing Lab safety or for saving the Lab money in areas outside your own job responsibilities, consider entering your suggestion on the special ESP form provided by Personnel, Bldg. 185. An original idea may win 10 percent of the estimated savings, up to a maximum of $10,000.

Before **Norman Franklin** retired in March from his job as Technical Project Supervisor for the Accelerator Development Department, he came up with an idea that will save the Laboratory $7,380 this year, and in the process earned himself a $738 retirement bonus from the Employee Suggestion Program.

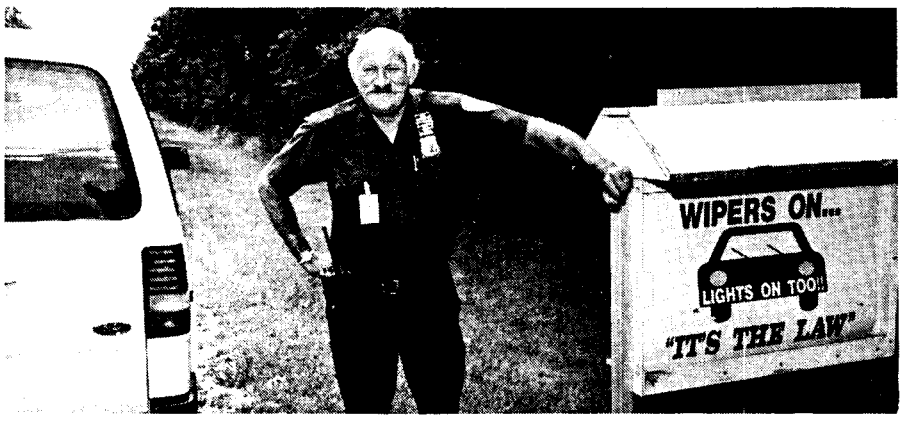
Franklin, who worked for 29 years at BNL, developed polycarbonate insulators for use in helium gas-cooled power leads, which conduct current from room temperature power supply systems to superconducting magnets operating at about 4 kelvins. The new lead was Franklin's answer to the failures that occur in the more brittle ceramic insulators that were previously used in gas-cooled power leads.

As components of the power leads that test superconducting magnets, these insulators have to be able to withstand 5 kilovolts while under an internal pressure of 375 pounds per square inch at a temperature of about 4 kelvins.

Because Franklin's insulator is made of polycarbonate rather than the more brittle ceramic, it is less subject to failure because of misalignment or thermal stress. This saves the Lab money both for parts and labor costs incurred in repairing or replacing a failed power lead.

Each ceramic insulator costs about $300, and it can take several people up to two weeks to replace a gas-cooled lead that has failed because of a broken insulator. Since such failures have caused delays in the BNL magnet test programs for both the Relativistic Heavy Ion Collider (RHIC) and Superconducting Super Collider (SSC), Franklin's insulators are currently being used in the MAG-COOL Horizontal Test Facility, in which the superconducting magnets for RHIC and SSC are being tested. Eventually, the insulators may even be used in RHIC.

Norman Franklin



Harvey Richardson, a Patrol Officer in the Safeguards & Security Division, suggested that employees need to be reminded of the newly adopted New York State law requiring motorists to turn on their headlights whenever windshield wipers are in use.

As a result, signs reminding employees of this law are currently posted at the main gate and will be posted temporarily at the north and south gates as well. In addition, the Traffic Safety Committee will consider placing reminder signs for other traffic laws adopted in the future. For his safety-minded suggestion, Richardson was awarded $25.

ESP & ALARA (cont'd)

Like any ESP submission, ALARA suggestions can be filed using the current ESP forms, which are available at department and division offices, the Berkner Hall lobby and Personnel, Bldg. 185.

To fill out the form, describe the ALARA technique now being used, the suggestion for improving the method and what the improvement will accomplish. Then present the completed form to an immediate supervisor, who will submit it to the ESP.

After checking the suggestion for eligibility, ESP personnel will forward it to a qualified ALARA coordinator, who will determine if it should go before the department or division ALARA committee.

If so, the appropriate department chairman or division head will first review the committee's findings, and then decide whether or not to put the suggestion to use. Where an ALARA suggestion may be applicable Lab-wide, the suggestion will be forwarded to Safety & Environmental Protection Division Head Robert Casey for review and analysis.

The award amount for implemented ALARA suggestions will be figured on the basis of $100 per person-rem saved in the first year, with a 0.25 person-rem minimum savings threshold for a minimum award of $25. Rem is the unit of measure for radiation exposure to humans. Payment of the award will be made after the suggestion has been put into effect.

For more information about this joint effort, contact either Susan Foster, Ext. 2888, or Kathleen McIntyre, Ext. 5868. — Erik Larson

Coming Up

Scientist Leonard Mausner, Medical Department, will present the first Brookhaven Lecture on the 1991-92 program, on Wednesday, September 11, at 4 p.m., in Berkner Hall. His topic will be "Reducing Bone Pain in Cancer Patients Using Radioactive Tin."

Inside Info

In response to the critical need for technologies to help cope with current worldwide environmental pollution problems, the U.S. Departments of Commerce and Energy and the Environmental Protection Agency are hosting a conference on the "Challenge of the Environment: New Technologies — New Markets."

To be held in Virginia, September 5-6, the program is designed to assist U.S. companies in identifying opportunities for commercializing federally funded environmental technologies and to locate sales opportunities in Eastern Europe.

At this conference, three Lab scientists will share their BNL-developed, environmental technologies:

- Chemical Engineer **Russell Dietz,** Department of Applied Science (DAS), will introduce "Commercial Applications of Perfluorocarbon Tracer Technology."
- Research Engineer **Paul Kalb,** Department of Nuclear Energy, will discuss "Waste Management Technology & Demonstration Programs."
- Chemical Engineer **Lawrence Kukacka,** DAS, will talk about "Environmentally Benign Polyelectrolyte-Modified Zinc Phosphate Coating Technology."

In Memoriam

Fred B. Krieger, Advanced Computer Analyst in the Computing & Communications Division (CCD), died on August 14, after a long, brave battle with cancer. He was 53 years old.

Krieger came to BNL in January 1965 as a senior computer operator in the Applied Mathematics Department. Though his 26 years at the Lab were all spent in this area, which became CCD in 1988, Krieger received a steady stream of promotions that brought him to his final position in 1990. In 1966, he was named Technical Specialist III; 1970, Computer Operations Shift Supervisor; 1978, Senior Technical Specialist; 1980 Computer Science Analyst II; 1981, Programmer Analyst; 1983, Computer Analyst; and 1989, Computer Analyst I.

A resident of Coram, Krieger is survived by his wife Joan; his son and daughter-in-law, Jeffrey and Gail Krieger; and his daughter and son-in-law, Sheryl and Ken Miller.

Speaking of her husband's fondness for his work and his colleagues, Joan Krieger said, "BNL was a tremendous part of of his life."

The Bulletin has also learned about the passings of two retirees who joined BNL at its very beginning:

William Kirklewski, who died on August 1 at the age of 73, came to the fledgling Laboratory on March 21, 1947, as a firefighter. In 1964, he was named Fire Captain. Kirklewski retired from BNL in August 1979 and most recently lived in Sidney Center, New York.

Kenneth Swezey, who worked at BNL for more than 40 years, died July 26, at the age of 66. He started at the Lab on March 24, 1947, as a laborer in the Architectural Planning & Plant Maintenance Division, which by 1955 had evolved into the Supply & Materiel Division. After becoming a truck driver in July 1947, Swezey moved to the bulk warehouse, Bldg. 100, as a stockman in May 1952. He was named Storesclerk in 1952, then Storeskeeper in 1955, as he moved to Bldg. 86, then 89, then Bldg. 91. After retiring in August 1987, Swezey stayed in his Patchogue home.

Waste (cont'd)

spilling just one gallon of the chemical can create an enormous cleanup bill," said Len Emma, Head of S&EP's Hazardous Waste Management (HWM) Section.

The proper procedures for handling TCA are listed in the BNL Safety & Environmental Administrative Policy and Procedures Manual. Failure to comply with these procedures, derived from U.S. Department of Energy (DOE) and New York State Department of Environmental Conservation (NYSDEC) regulations, can bring fines and severe penalties to the chemical's users — both individual and institutional.

"TCA should never be poured down the drain or put into the sewage system," observed Robert Miltenberger, head of S&EP's Environmental Protection Section. "The Lab's sewage treatment plant is not permitted to receive it. Waste TCA should be collected in proper containers and disposed of by the Lab's Hazardous Waste Management Group."

"Proper handling and disposal methods should be understood for all chemicals used on site, not just TCA," added Peter Kwaschyn, Manager for S&EP's Waste Engineering and Operations Group. "Facility operators must know their process needs, their effluent and their waste streams. Improper use could lead to the same problems we are trying to remedy now with the plume of TCA in the aquifer."

Kwaschyn was referring to a narrow plume of TCA in the groundwater under the Lab near the Hazardous Waste Management Area. It is moving, with the groundwater, toward the site boundary in concentrations higher than the New York State drinking water standard. This plume was created before TCA disposal methods became regulated in the early 1980s, and BNL and DOE are currently working with the Environmental Protection Agency and NYSDEC on a plan to clean up the contamination.

Kwaschyn said, "Regulation of all hazardous chemicals used at the Lab is the best way to prevent similar environmental contamination in the future. But regulations won't work by themselves — we need cooperation."

So, when the time comes to dispose of hazardous chemicals, contact your department or division's S&EP representative. As the liaison between the Lab's waste generators and HWM, they are responsible for providing guidance on the proper handling and labeling of hazardous chemicals, assisting with testing for radioactivity, and identifying "mixed wastes" that have both chemical and radioactive components.

"What constitutes hazardous waste can seem harmless at first," said Michael Clancy, staff engineer with S&EP's Regulation and Minimization Group. "A simple thing like wiping down equipment with a rag sprayed with TCA creates hazardous waste material that must be bagged and tagged and disposed of correctly. Even the aerosol can from which the TCA is sprayed is considered hazardous if any TCA is left in it at the time of disposal."

"Of course, the best approach is not to create the waste in the first place," Goode concluded. "Consider substitution: Do you need to use TCA to clean the part, or would some other, less toxic substance do the job just as well? There are many new alternative cleaning products now available to replace chlorinated solvents like TCA and Freon."

For information on these and other waste reduction methods, call Goode at Ext. 4549. — Erik Larson

Sign up for Stretch Or Aerobic Dance

It's almost September — time to think about getting back to class — with the Aerobic Dance Club. Instructor Pat Campbell will lead classes in:

- **Stretch** — Classes involve a choreographed program of exercises that concentrate on stretching and strengthening various muscle groups.
- **Aerobic Dance** — Classes emphasize cardiovascular improvement through vigorous, choreographed exercise.

Classes in aerobic dance will be held on Tuesdays and Thursdays, while stretch classes will be held on Mondays. All classes run from 5:15 to 6:15 p.m. Participants may take any or all of these classes. Mats are recommended for floor exercises.

The fee for each ten-week session (M, T or Th) is $30, payable at registration preceding the first classes:

- **Stretch** — Monday, September 9, at Physics, Bldg. 510.
- **Aerobic Dance** — Tuesday, September 10, and Thursday, September 12, at the Recreation Building in the apartment area.

For more information, call Pat Campbell, Ext. 4853 (mornings) or Ext. 5070 (afternoons), or Janet Sillas, Ext. 2345.

Touch Football

The BNL Touch Football League will begin its season on September 16. The league currently includes four teams, which will play Mondays and Thursdays for about five weeks. The games are one-hand touch and are refereed.

The League is interested in new players and complete teams eager to participate. So, if you are looking to stay active after the softball season is over, then join the football league. For more information, call Fran Loeb, Ext. 2092, or Wayne Rambo, Ext. 2284.

Metropolitan Opera Tickets To Go on Sale

Family-circle tickets for certain performances of the 1991-92 Metropolitan Opera season will go on sale on Thursday, September 5, at the BERA Sales Office in Berkner Hall.

All tickets are $20.50 each. The list of BERA subscription tickets and dates available is noted below and available at the Sales Office, weekdays, from 9 a.m. to 2 p.m. Employees may purchase as many tickets as they wish, but all sales will be final — no refunds or exchanges.

Fri., Sep. 27	*Don Giovanni*
Fri., Oct. 11	*Die Zauberflote*
Sat., Oct. 12	*Don Giovanni*
Sat., Oct. 26	*Un Ballo in Maschera*
Fri., Nov. 1	*Un Ballo in Maschera*
Sat., Nov. 16	*Aida*
Fri., Nov. 29	*Die Entfuhrung aus dem Serail*
Sat., Nov. 30	*Cosi Fan Tutte*
Sat., Dec. 21	*Die Entfuhrung aus dem Serail*
Fri., Jan. 3	*La Traviata*
Sat., Jan. 18	*L'Elisir d'Amore*
Fri., Feb. 7	*Der Fliegende Hollander*
Sat., Feb. 8	*Turandot*
Fri., Feb. 21	*Tannhauser*
Sat., Feb. 29	*Tannhauser*
Fri., Mar. 6	*Le Nozze di Figaro*
Sat., Mar. 21	*Rigoletto*
Fri., Apr. 10	*Elektra*

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BERA Art Society Exhibit
The Mediterranean Meets New York

The mood of artist Valerio Cugia's pictures ranges from the tranquil glow of landscapes evoking his native Italy to the thrusting excitement of night city scenes that are unmistakably New York. Using vibrant color to shape the play of light and shade on structure, Cugia creates stylized forms that distill and transmit feeling.

Artist Valerio Cugia

Approximately 25 of Cugia's paintings, including several from his recent exhibition at the Pindar Gallery, New York City, and a number of monotypes and etchings will be shown at Berkner Hall next week in an exhibition sponsored by the BERA Art Society.

Cugia came to BNL in the fall of 1990 with his wife, visiting physicist Petra Rudolf, who is working with AT&T Bell Labs at the National Synchrotron Light Source. Cugia started painting immediately, inspired both by Long Island's countryside and seashore, as well as the surging skyscrapers of Manhattan. He also became an active member of the BERA Art Society.

Born in Rome in 1957, Cugia began studying with the painter and printmaker Manlio Guberti at the Academy of the Arts in Rome. In 1984 he was awarded a fellowship to Münster, Germany, and later participated in various national and international graphics competitions in England, France, Italy, Germany, Spain and the United States.

He has had one-man shows in Rome, in 1981 and 1989; Saarbrucken, 1986; Munich, 1990; and New York this year. In addition, Cugia has participated in group painting and print exhibitions both here and over much of Europe, including shows in Paris, Florence and Amsterdam.

Valerio Cugia Exhibition Hours

Tuesday, September 3
Opening Reception — 5 to 8 p.m.
Wednesday to Friday, September 4 - 6,
11:45 a.m. to 1;30 p.m.
Refreshments will be offered.

Gym & Pool Closed; New Pool Season

The gymnasium and pool complex will be closed for the Labor Day weekend, Saturday, August 31, through Monday, September 2.

The gymnasium will reopen on weekends beginning Saturday, September 7.

The new four-month season at the swimming pool will begin and normal hours will resume on Tuesday, September 3. The season will end Tuesday, December 31. Tickets can be purchased at the pool during open hours.

The hours will be as follows:

Monday through Friday

11 a.m.-1:30 p.m.	employees only
1:30 p.m.-2 p.m.	reserved for speed swimming and training
5 p.m.-9 p.m.	employees, families and guests*

Saturday and Sunday

1 p.m.-5:30 p.m.	employees, families and guests*

Daily Admissions

Employee or family member	$2.00
Guest	$3.00

Season Tickets (fees not prorated)

Individual membership	$40.00
Family membership	$50.00

*** Guest ruling for all recreation facilities:** *One guest per employee is permitted. Advance arrangements for additional guests, up to a maximum of five at any one time, must be made at the Recreation Office, Personnel Division, Bldg. 185. Guests must be accompanied by the employee.*

Arrivals & Departures

Arrivals

James G. Cammarata.....Accel. Dev.
George Gharabeigie.....Reactor
Joseph P. Gromley.....Accel. Dev.
Carmine Guarino.....Accel. Dev.
Joseph G. Guilmette.....Accel. Dev.
Jean E. Howard.....Medical
Kenneth B. Jones.....Accel. Dev.
William T. Kuhnle.....Accel. Dev.
Michael J. Lehecka.....Accel. Dev.
Dianne M. Polowczyk.....Occ. Med.
Joseph R. Preisig.....Saf. & Env. Prot.
Nicholas F. Thomas.....Accel. Dev.
Kenneth C. Vogel.....Accel. Dev.
Richard L. Weiner.....Accel. Dev.

Departures

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

Steven J. Milder.....Chemistry
Cara Wilson.....App. Science

Atlantic City Trip

There are still seats available for the next BERA-sponsored, one-day trip to Trump Castle Hotel and Casino on the Marina in Atlantic City, on Saturday, September 14.

The initial cost will be $20, but the hotel/casino will give a $10 coin return, $4 towards food and a $5 deferred return- bus voucher.

Tickets are on sale at the BERA Sales Office in Berkner Hall, weekdays from 9 a.m. to 2 p.m. The bus will leave the Brookhaven Center promptly at 9 a.m. and return approximately 11:45 p.m. There will be an extra pickup at LIE Exit 63, if requested.

If you have questions, call Carolann Zebrowski, Ext. 3347; Rosalie Piccione, Ext. 3160, or Kay Dellimore, Ext. 2873.

Scoop of the Week

For suggesting that the Bulletin publicize possible discounts that local eateries and merchants may give to BNL employees, Peter McHugh of the Management Information Systems Division is hereby awarded a Scoop of the Week.

For suggesting news and story ideas to the Bulletin, you too may win a Scoop of the Week. If you scoop the Bulletin's informed sources and your hot tip is turned into a published story, then you will be rewarded with an official certificate, redeemable for your favorite cold dessert, complements of Service America Corporation and redeemable at the Cafeteria or the ice cream truck.

To enter, write the Bulletin, Bldg. 134, or phone Ext. 5053, before summer's end.

Addled Addresses

- Brookhaven Nut Labor
- Brookhaven National Labor

Discount? Maybe!

Some of the fast-food eateries and other establishments popping up within range of the Lab are offering discounts to BNL employees with proper identification. There may not be a sign, so ask the proprietor. You may be pleasantly surprised!

You Never Know What You'll Find In the Classifieds!

Mordechai Bordoley will be joining the National Synchrotron Light Source Department (NSLS) in September as a staff engineer. In the meantime, he and his wife Esmé Hoban have been receiving the Bulletin at their home in Massachusetts, "so we could get to know BNL and to check the classified for housing."

Recently, Hoban wrote to say thank you for sending the Bulletins and to relate the following story:

> . . . Every time the packet of Bulletins arrive, we rip it open right away and begin reading. We really enjoy it. Alas, we have not yet found housing through the classifieds (if you know of a 3-bdrm house for rent in Commack, please tell us!), but we did find a childhood acquaintance I haven't seen in about 20 years!
>
> I was perusing the classifieds and came across an item for sale and the seller's name was uncommon enough to make me wonder if it were the same person I knew as a child. It turned out to be one and the same (he had since moved to Austin, Texas, and I had been in Israel and Hawaii among other places). We got together over the 4th of July holiday back in our hometown of Wilton, Connecticut, and to further complete the string of coincidences, he works in the NSLS Department too! [Hoban's old friend is Ballard Andrews, a guest junior research associate with the University of Texas at Austin.]
>
> . . . Once again, thank you so much. Somehow, being able to read about the place where Moti will be spending most of his days is really helpful in making the difficult transition from the home we know and love here in Northampton to the unknown somewhere on Long Island!

Archery Club

The Archery Club will hold its monthly meeting on Thursday, September 5, at noon, at the gazebo by the softball fields. In case of rain, the meeting will be held in the Physics seminar room lounge, Bldg. 510. New members are welcome. For information, call Bill Schoenig, Ext. 2377.

Note to Diners

The Cafeteria will be closed on Saturday, Sunday and Monday, August 31 to September 2, for major electrical renovations. These modifications to the electrical system are necessary to upgrade service.

During this period, the Tap Room at the Brookhaven Center will provide breakfast, lunch and its standard evening menu as follows.

- **Saturday, August 31 —**
  9 a.m. to 2 p.m. and 5 p.m. to 9 p.m.
- **Sunday, September 1 —**
  9 a.m. to 2 p.m.
- **Monday, September 2 —**
  9 a.m. to 2 p.m. and 5 p.m. to 9 p.m.

The vended-food service in Bldg. 912 will be in operation throughout the weekend.

Cafeteria Menu

Luncheons

Monday, September 2 — Labor Day
Holiday hours - 9 a.m. to 2 p.m.
at the Brookhaven Center

Tuesday, September 3	
Soup: Cream of broccoli	.75/.95
Entree: Beef stew & 1 veg.	3.10
Entree: Eggplant Parmesan & 1 veg.	3.10
Fitness: Chef's choice	3.10
Carvery: Hot roast beef sandwich	2.85
Grill: Grilled Reuben w/cole slaw	2.85
Wednesday, September 4	
Soup: Minestrone	.75/.95
Entree: Seafood platter w/fries	3.55
Entree: Chef's choice	3.10
Fitness: Vegetarian plate w/roll	2.25
Carvery: Hot Black Forest ham sandwich	2.85
Grill: Cheeseburger, fries & 12 oz. coke	2.85
Thursday, September 5	
Soup: Country Italian bean	.75/.95
Entree: Pizza	3.25
Entree: Chef's choice	3.10
Fitness: Quiche Lorraine & 1 veg.	3.10
Carvery: Hot corned beef sandwich	2.85
Grill: Two dogs, fries & 12 oz. coke	2.45
Friday, September 6	
Soup: New England clam chowder	.75/.95
Entree: Chef's choice	3.10
Entree: Spaghetti & meatballs	3.10
Fitness: Broiled fish fillet & 1 veg.	3.10
Carvery: Hot turkey sandwich	2.85
Grill: Tuna melt w/fries & pickle	2.85

September Special - Catch the Cup!
32 oz. NFL Sports Cup*
1st fill up w/soda, $1.29; refills, 79¢
*while supplies last

Breakfast Served w/coffee & small juice, 7:30 - 10:30 a.m. 2.65

Mon.: 2 eggs, bacon, one pancake, home fries
Tue.: Western omelet, home fries, toast
Wed.: Spanish omelet, home fries, toast
Thu.: 2 eggs, bacon, cheese on croissant, fries
Fri.: French toast, 2 eggs, bacon, home fries

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position. Consideration is given to candidates in the following order: (1) present employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present employees within the Laboratory; and (3) outside applicants. In keeping with the Affirmative Action plan, selections are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

Each week, the Personnel Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Personnel, and, second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (282-7744), for a complete listing of all openings.

The vacancies listed below have been exempted by the Director's Office from the current freeze on open requisitions.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

DD 0170. SECRETARIAL POSITIONS - Requires an AAS in secretarial science or equivalent experience and knowledge of general office procedures. Knowledge of IPAP and Laboratory procedures desirable. Will input purchase orders, RFQs and prepare contract files. Division of Contracts & Procurement.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

DD 0976. DRAFTING POSITIONS (term appointment) - Requires AAS or equivalent and ten years' mechanical drafting/design experience. Must have basic knowledge of engineering fundamentals, machine design, machine shop procedures and understanding of MIL-STD-100 and ANSI Y14-5-1982. Must be able to perform professional-level design functions. Accelerator Development Department.

DD 0974. DRAFTING POSITIONS (term appointment) - Requires AAS or equivalent and ten years' mechanical drafting/design experience. Must have basic knowledge of engineering fundamentals, machine design, machine shop procedures and understanding of MIL-STD-100, ANSI Y14-5-1982 and AUTOCAD Release 10. Must be able to perform professional-level design functions. Accelerator Development Department.

DD 0453. SAFETY/ADMINISTRATIVE POSITION - Requires AAS with BS preferred in a relevant field, previous experience coordinating full range of division machine shop safety activities and excellent oral and written communication skills. Responsibilities will include policy implementation, inspections and follow-up, development of new procedures manuals and maintaining current procedures manuals. Will also act as member of Division Safety Committee. Familiarity with LOTUS 1-2-3 and DBase 4 desired. Central Shops Division.

LF 5523. PROGRAMMING/ANALYST POSITION - Requires a BS degree in computer science, mathematics or equivalent. A minimum of two years' experience in either UNIX or VMS operating systems and the C programming language is necessary. Experience with network-based software systems based on TCP/IP, DECnet, OSI and Novell protocols, as well as an advanced degree, is desirable. Primary responsibility will be supporting computer networking throughout the Laboratory. Computing & Communications Division.

Motor Vehicles & Supplies

90 GEO STORM - 5-spd., red, tinted windows, ac, alarm, speaker sys., asking $9,000; 84 Honda 200X ATV, asking $450. 698-8514 after 5 p.m.

89 TOYOTA TERCEL - 2-dr. coupe, white, 29k mi., am/fm cass., ac, sunroof, excel. on mileage, $6,000. 286-3231.

87 DODGE SHADOW - 5-spd., ac, p/s, p/b, 53k mi., $5,000. John, Ext. 7623.

87 MITSUBISHI CORDIA - 5-spd., ac, new exhaust, clutch, excel. cond. Mike, Ext. 4293.

86 CHRYSLER NEW YORKER - turbo, 4-cyl., 4-dr., leather int., digital dash, voice alarms, all avail. options, mint, $5,400. Jim, Ext. 4040 or 289-0876.

86 CHEVETTE - a/t, ac, 67k mi., no rust, mint cond., $2,500. 286-9426.

85 FORD PICKUP - 6-cyl., 396 cu. in., p/s, p/b, a/t, ac, stereo, new bedliner, new custom seat, excel., orig. owner. John, 563-6596.

85 SUBARU - 4wd wagon, 5-spd., ac, am/fm tape, looks good, runs well, $2,300. Alan, Ext. 2928 or 929-0461.

84 NISSAN SENTRA - ac, stereo cass., 2-dr., 5-spd., 81k mi., excel. cond., avail. Sept. 2, asking $1,400. Ext. 4369 or 399-6424.

83 THUNDERBIRD - turbo, 5-spd., ac, p/w, sunroof, alarm, excel. cond., $2,750. 281-5827, leave message.

83 CHRYSLER LEBARON - 4-dr., a/t, p/b, p/s, p/w, ac, tape/fm, excel. cond., orig. owner, garaged, 68k mi., $2,050. John, Ext. 2509.

82 YAMAHA XS400HS MOTORCYCLE - 6k mi., helmet, w/access., $800 neg. 878-2702 after 6 p.m.

82 FORD MUSTANG - V6, p/w, p/b, p/s, ac, stereo w/cass., mint cond., $1,700. 661-5695 eves.

80 BUICK CENTURY - p/s, p/b, am/fm, security sys., Michelin tires, new exhaust, new brakes, 98k mi., $1,500 neg. Tanya, 924-2579.

79 YAMAHA XS400 PARTS - $100. Bob, Ext. 4672 or 929-4753.

78 TOYOTA CELICA - 5-spd., new radiator, needs muffler, battery, good for extra parts, $175. Jack, Ext. 4037.

78 PURITAN CAMPER - 19', best offer. John, Ext. 7623.

69 CAMARO RALLY SPORT - classic car, $3,100. Jim, Ext. 3372 or 821-0250.

57 CHEVY - 4-dr., good cond. in/out, tires, engine, neg. or trade for early 60s convertible, good cond. Dom, Ext. 4851.

31 CHRYSLER MODEL B 2-SEATER - rumble seat, all orig., excel. cond., must see, asking $7,500. Ext. 3160 or 289-5704.

MOPED - good shape, runs, moving, must sell, $120 or best offer. Ext. 7901 or 3232 eves.

TIRES - 2, trailer B-78-13ST, like new, $20/ea. Frank, 281-1457.

FORD PARTS - for cars & trucks, long battery cable, heads, pistons, headers, flywheels, converters. Wayne, Ext. 3084.

84 CHEVY ENGINE - 350, 4-bolt, main short block, good cond., $200 or best offer. Eddie, Ext. 2011 or 399-5701, leave message.

CAR STEREO - Concord CX-50, 100W pre amp, pile base speakers, theft resistant, $800; color TV, working cond., $25. Tim Jochen, Ext. 3496.

Boats & Marine Supplies

16' BOWRIDER - f/g, 65 h.p. Evinrude, tilt trailer, power winch, $1,700. Jim, Ext. 3372 or 821-0250.

14' HOBIE CATAMARAN - roller reefing jib, trailer, $1,400 or best offer; kayak, klepper double, f/g, good cond., $500. Ext. 7657 or 298-9560.

Furnishings & Appliances

AIR CONDITIONER - 17,000 Btu 8.5 EER rating, 220 volt, excel. cond., 15"x22" casing for window. Frank, 727-5096.

ASSORTED FURNITURE - queen-size bed, 1 yr. old, $150; computer desk, 2 mo. old, $40, after Sept. 2. Ext. 4369 or 399-6424.

SPINDLEBACK CHAIRS - 6, good cond.; upright freezer; organically grown garlic, $3.50/lb. 363-7032.

COUCH - Ethan Allen, 7', excel. cond. 325-0447.

DINING ROOM - $250; wicker headboards, $20/ea.; boy's bike, 16", $20; scooters, 2, $20/ea.; chairs, $25/ea. Corinne, Ext. 3662.

DINING ROOM - antique art deco, table w/leaf, 4 chairs, china cabinet, server w/mirror. Dom, Ext. 4851.

HIGH CHAIR - Jenny Lind, solid maple, $35. Paul, 361-6835.

LIVING ROOM - shelves, pictures, sofabed, hassock, recliner, lamps, jelly-cabinet, snack tables, sewing machine, more. Frances, Ext. 2901.

TABLES - 4, pine; 2 27" storage lamp/end tables; dropleaf w/drawer cocktail table; bellows shape 2" cocktail table; corner hutch. 727-0499.

WASHER/DRYER - excel. cond., $300/set. Liz, 689-5990.

WASHER & DRYER - heavy-duty, space mates, stack, 2 separate units, v.g. cond., reasonable. Ext. 2964.

WATER PURIFIER - Culligan, 3 yr. old, orig. $3,000, asking $950. John, Ext. 7623.

TRUNK - wicker, $20; pink wicker chair; stenciled vegetable bin; brass candlestick, $10; silk flower arrange., $10; suitcases, $20. Kathy, 744-2203.

Tools, House & Garden

DRILL PRESS - floor model, $65; 10 doz. canning jars, $12; push lawn mower, $8; L-shape wrought iron railing, $20/pair; bottle capper, $10. 878-6637.

GENERATOR - 4000W, almost new, used 8/19 first time, recoil start, Briggs & Stratton 8-h.p. motor, asking $500. Roy, Ext. 7357.

LAWN MOWER - 20" cut, 3½ h.p., runs well, $40. Eddie, 399-5701.

LAWN MOWERS - Locke, 75", reels F-N-R, sulky, $850; Huffy, 26", rider, 8-h.p., electric start, $250. Ed, Ext. 7251 or 765-4147.

SHUTTERS - black plastic, 43"x14", $3/pair or $10/five pairs. Joe, pager 0925 or Ext. 2898.

TOPSOIL - fine or rough screened, delivered, 3 yard minimum. 696-6011, leave message.

WINDOW - 30"x30", double hung, 6 over 6, alum., w/storm & screen, $25; Sears 4000W electric heater, 240 volts, w/thermo., $25. Tom, Ext. 7707.

Sports, Hobbies & Pets

BICYCLE - Ross, girl's, 24", 10-spd., good cond., $30. Cara, 581-4238.

BICYCLE - Huffy, woman's, $60; Graco Brougham stroller/carriage, $60, both like new. Ext. 4985.

FISH TANK - 50 gallon, complete setup, lights, stand, filter, heater, gravel, decorations, asking $150. Roy, Ext. 7357.

FISH TANK - setup, 20 gallon w/stand & light, $45. Kim, 399-5701.

FLUTE - Artly 18-0, needs tune-up, $75; Minolta Easy Flash camera, range finder, F-1.7 lens, 500/sec. shutter speed, $50. Janet, Ext. 2345.

LABRADOR RETRIEVER PUPPIES - chocolates & yellows, bred for large size, good temperament, great w/kids, ready 8/31. reasonable. 924-5062.

ORGAN - Thomas, w/bench, excel. cond., $750 value, sell for $125. 924-5192.

ROWING MACHINE - made by DP, w/tension adjustment & timer, $50. Paul, Ext. 4045.

Audio, Video & Computers

CD PLAYER - Magnavox, 6 changer cartridge, 5 mo. old, $130 neg; Panasonic VCR, remote, $50. Andrea, Ext. 4897.

COMPUTER - Commodore 64, disc drive, software, various games, joystick, excel. for children, asking $120 neg. John, Ext. 3558.

COMPUTER - Commodore 64, mon., disk, tape, Koala pad, joysticks, assorted software, printer interface, $300. Alan, Ext. 2928 or 929-0461.

ENTERTAINMENT CENTER - small, $40; phone, car w/lighting headlights, push button, $15; Tim Jochen, Ext. 3496.

ENTERTAINMENT UNIT - 49½"w x 15½"d x 66½"h, excel. cond., $25. 924-2726.

RADIO TUBES - old, hard-to-find parts, antique items. Connie, Ext. 3662.

CONSOLE TV - Zenith System 3, 25", color, remote, stereo sound, excel. cond., $250. 369-2716 after 6 p.m.

Miscellaneous

AIRLINE TICKET - Delta, 1-way, non-stop, anywhere in USA, valid until 9/18/91. 286-3701.

CHRISTMAS TREE - 4' high, nice shape, used one year, $35. Ed, 399-5701.

LIGHT TABLE - Bishop Graphics, model #3201, self-standing, 25½" x 37½" surface area, $100. Bob McCarthy, Ext. 5265.

MET OPERA TICKETS - 2, *L'Elisir D'Amore*, Sat. matinee, Nov. 16, Battle, Pavarotti, rear orchestra, $57/ea. Joyce, 289-5770 after 6 p.m.

TYPEWRITERS - two portable manuals, with carrying cases, one Adler, one Smith-Corona. $40 each. 286-8664.

WINE PRESS - tabletop, $45; combination storm door, 35"x82", excel., $35; picture window, 122"x59", $20; set of 8 dishes, $45. 878-6637.

Free

CLAY POTS - large, for plants. Susan, Ext. 7716.

COLLIE MIX - loveable, spayed, gentle, needs home w/yard, kids, lots of love & attention. Nate, Ext. 3556.

ELECTRICAL STOVE - excel. cond.; orange cast-iron stove, 40,000 BTU. Ext. 8740.

KITTENS - 7 weeks old. Rob, Ext. 5462 or 696-1617.

ROOM & BOARD - pvt. apt. in exchange for light housekeeping, cooking evening meal, Mon.-Fri., some baby-sitting for 7 yr.-old. Maggie, 878-0331.

Yard & Garage Sales

MANORVILLE - Sept. 6-14, Halsey Manor Road, furniture, tools, household, shells, canning supplies, more.

MEDFORD - Sat., Sun. & Mon., 8/31 & 9/1-2, furn., wicker headboard, bikes, scooters, more, 20 Swisstone St., Medford. Corinne, Ext. 3662.

RIVERHEAD - Sat., 8/31, rain date Monday 9/2, oak furniture, glassware, household, misc., 114 Fairway Ave.

Real Estate

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

For Rent

CALVERTON - 2-bdrm. townhouse, 1½ baths, w/d, dw, cac, w/w, deck, enclosed patio, fp, 3 min. to LIE, $665/mo. + util. Ext. 4701.

CENTER MORICHES - large sunny bdrm., kit., priv. use of entire house, quiet neighborhood, walk to RR, library, stores, bay, 10 min. to Lab., no pets, $350 incl. util. Marilyn, Ext. 2259.

MASTIC - 1-bdrm. apt., furn., sep. ent., cable, $450/mo. + sec. & refs. 281-7844 eves.

MILLER PLACE - 1-bdrm. apt., paneled kitchen, l/r, full bath, w/w, priv. ent., quiet neighborhood, $560/mo. includes all. 928-0093.

N. PATCHOGUE - 1-bdrm. apt., bright, pool, patio, cable, $600/mo. + sec. incl. all. 654-5607.

RIDGE - furnished studio apt., private, fenced-in yard, 5 min. from Lab., avail. end of Oct. $500/mo. 744-8632.

RONKONKOMA - 2-bdrm. condo, Nob Hill, tennis, pool, clubhouse, w/w, patio, all appl., ac, $900/mo., incl. heat. Bill, 878-6016.

WESTHAMPTON - 2-bdrm. guest house, furn., year-round rental, very priv., use of pool, $950/mo. Jane, Ext. 4909.

PALM HARBOR, FL - 3-bdrm. townhouse, 2½ baths, carpeted, 5 appl., cac, screened patio, lake view, gar., pool use, no pets, lease. Ext. 3558.

CLAREMONT, NH - 2-bdrm. condo, antique shops, factory outlets, 10 min. to Lake Sunapee, 1 hr. to Lake Winnipesaukee. $330/wk, $225/wknd. Frank, Ext. 7749.

KITTY HAWK, NC - 2-bdrm. condo, sleeps 6, walk to guarded beach, golf, fishing, horseback riding nearby, VCR, cable, fully furn., $500/wk. Jeanne, Ext. 7742 or 281-7568.

HILTON HEAD, SC - 2-bdrm. condo, sleeps 6, 2 baths, pool, beach, golf nearby, May-Sept., $450/wk for BNL employees & family members. Guy, Ext. 3147 or 689-5378.

For Sale

BELLPORT VILLAGE - 3-bdrm. 5-yr.-old Col. l/r, d/r, fp, 2½ baths, oak floors, fin. bsmt., ig sprinklers, village rights, assum. 8.8% mortgage, 1st owner. Claudio, Ext. 2731 or 286-5579.

BROOKHAVEN - 2-bdrm. Cape, cedar shake, l/r, d/r, eik, spa rm., full unfin. bsmt. w/shop area, 2-car gar. w/shed, near boat ramp, low taxes, $195,000. Ext. 3844.

CALVERTON - 3-bdrm. mobile home, 12'x62', a/c, all appl., storage shed, family park, ask. $32,500. 369-2648.

CENTRAL ISLIP - 2-bdrm. Cape, new bath, l/r w/bay window, eik w/greenhouse window, extension vinyl windows, shed, bsmt., near all, $85,000. Brian, Ext. 7519 or 234-9487.

CORAM - Strathmore East, 4-bdrm. ranch, 2 baths, cathedral l/r, 2-car gar., gas heat, fenced corner lot, $120,000. Ext. 3791 or 928-7154.

EAST MARION - beautiful 1 acre bldg. lot, adjacent to Greenbelt, walk to Sound. 325-0447.

MIDDLE ISLAND - Coventry Manor, 3-bdrm. townhouse, 2 baths, kit., l/r, d/r, cac, 5 appl., patio, pool, tennis, clubhouse, carpet, ask. $102,000. Rosalie, Ext. 3160 or 289-5704 after 5 p.m.

MT. SINAI - 3-bdrm. spacious ranch, 2-car gar., ¾ acre, garden, fp, waterview, fruit trees, oil heat, 1½ baths, carpeted, $279,000. 473-0178.

MT. SINAI - 4-bdrm. Colonial, l/r, d/r, eik, den, 2½ baths, bsmt., 2-car gar., new fence, 0.4 acre, $170,000. 331-3785.

N. BAYSHORE - mint, newly decorated 2 bdrm., l/r, d/r, eik, den, 1½ baths, w/w, carport, gar., patio, igp, more, $139,000. 698-0576 or 231-6017.

PORT JEFFERSON STATION - 4-bdrm. L-shaped ranch, 3 baths, 2 kit., l/r, d/r, fam. rm., fp, ac, part. fin. bsmt., circular drive, ⅓+ acre, fenced, M/D potential, $149,990. 474-2149.

RIDGE - 3-bdrm. townhouse, 1½ baths, cac, w/w, all appl., patio, storage rm., attic, low monthly maint., 5 min. to BNL, $80,000. Mary, 924-4328.

SHIRLEY - Tangiers Section, 4 bdrm., close to Wm. Floyd Elem. School, 5 min. to BNL, rent w/option to buy, $1,050/mo. or $120,000. Jane, Ext. 4909.

SHOREHAM - 4-bdrm. brick Cape, eik, playroom, gar., full bsmt., 1½ baths, remodeled, conven. loc., SWR SD, $135,000. Janet, Ext. 2345 or 929-3910.

SHOREHAM - 4-bdrm. Cape, attach. 2-car gar., 2 fp, 1½ baths, d/r, 1-acre treed lot, new appliances, extras, estate sale. Vi, Ext. 5169 or 744-6043.

SHOREHAM - N25A, 3 bdrm., 2 baths, kit., d/r, l/r, fp, encl. porch, deck, full bsmt., 2-car gar., deeded beach rights. John, Ext. 4947.

YAPHANK - Whispering Pines, 3-bdrm. townhouse, a/c, bsmt., gar., fp, $120,000, neg. 924-2726.

Wanted

APARTMENT - to rent for about 10 days, Sept or Oct., local, reasonable. Charles, 407-878-5110.

DIVING PARTNER - steady, once or twice per week, any experience level OK, Rocky Point area. Mark, Ext. 7978.

ENCYCLOPEDIA - World Book, less than 5 years old. Anne, 361-6835.

HOUSE TO SIT - free, reliable, exp., avail. any duration from Aug. 30 to Sept. 15. J. Allentuck, Ext. 2412.

HOUSEMATE - to share waterfront house in East Patchogue, walk to beach, $350 & share utilities. Ext. 2145.

KEEN UNITED WAY SUPPORTERS - to help with BNL's campaign, Nov. 4-15. Contact Mike Hurley, ASAP, Ext. 5372.

NORDIC TRACK - Larry, 821-5497.

OUTBOARD MOTOR - for boat, betweeen 35-40 h.p., short shaft, 1980 or newer, reas. Ext. 4843.

Ads left out of this issue due to lack of space need not be resubmitted to appear in the next issue.