BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

# Biologists Use NSLS for First Look At Structure of Ribosomal Protein

Not only do ribosomes make the body's protein, but they also contain protein. The structure of one key ribosomal protein — designated S5 — has now been determined by Venki Ramakrishnan of BNL's Biology Department and Stephen White of Duke University Medical Center.

With this work on protein S5, these researchers have become the first to get high-resolution information about the smaller of the two subunits of the ribosome, a fundamental cell component. This information will be essential to understanding the complicated method whereby ribosomes translate the genetic code into protein. In addition, the findings advance knowledge of how this protein is involved in antibiotic resistance.

Initially reported in *Nature* last August 27, Ramakrishnan and White's research was done at BNL's National Synchrotron Light Source (NSLS). They collaborated with Robert Sweet of the Biology Department, who developed beam line X12C specifically for studying the structure of large biological molecules.

Said Ramakrishnan, "Bob's instrument allows us to tune the x-ray wavelength accurately, a feature that was important for the success of this work."

### Ribosomes and Antibiotics

Because of their essential role in the protein-making process, Ramakrishnan said, ribosomes are very ancient.

"They are so old," he commented, "that the ribosomes of bacteria and humans have diverged considerably over the course of evolution. One result of this divergence is that it allows many antibiotics to work."

Ramakrishnan explained that ribosomes contain over 50 protein molecules and three ribonucleic acid (RNA) molecules. An antibiotic is thought to bind to a specific part of the RNA in a bacterial ribosome and distort it, preventing the distorted ribosome from working normally, and, thus, killing the bacteria. An antibiotic can act on the bacteria without seriously affecting human cells *because* the bacterial and human ribosomes are so different.

But mutations can arise that make the bacterial ribosome resistant to these antibiotics. "For example," Ramakrishnan said, "streptomycin, which was widely used to treat tuberculosis, is virtually useless today, because most TB bacteria have become resistant to it."

### The Role of S5

Sometimes, there are mutations in the ribosomal protein that binds to this region of the RNA. These mutations can compensate for the antibiotic's distortion of the ribosome, so that it can still function, even with an antibiotic present. This leads to ribosomes and, therefore, bacteria, that are resistant to that antibiotic.

In protein S5, for example, mutations occur that make the ribosome resistant to spectinomycin, an antibiotic used to fight gonorrheal infections. Other mutations in S5 change the way that the ribosome responds to streptomycin.

And Ramakrishnan and White's research was the first to locate the sites of such mutations in a three-dimensional study.

"Now, it will be possible for researchers to begin analyzing how these mutations have their effect," Ramakrishnan commented.

Ribosomes are interesting in another way — as the center of a paradox in which something that is itself made up of proteins is used to make proteins.

Early in the evolution of life, ribosomes probably had no proteins, being made up of RNA alone. Scientists hope to find out how ribosomal proteins evolved and became part of

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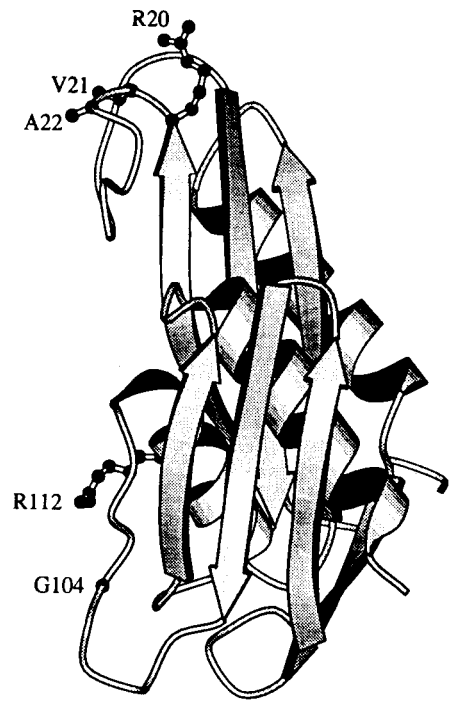
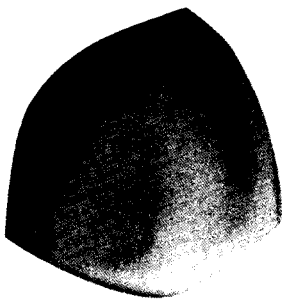


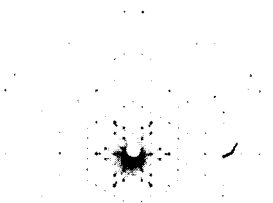

**Structure of the S5 molecule, shown as a "ribbon diagram" that follows the protein chain. The marked sites, when they mutate, change the ribosome's response to antibiotics.**

**Venki Ramakrishnan, Sue Ellen Gerchman (left) and Helen Kycia look at a computer-generated picture of the ribosomal protein S5, obtained from x-ray diffraction data. To solve S5's structure, the intensity of the spots in a diffraction pattern (far right) is measured before and after gold atoms have been bound to the molecule.**

Photos left and bottom by Roger Stoutenburgh



**Left: A crystal of S5.**



**Right: The diffraction pattern seen when x-rays scatter off a crystal of S5.**

# Higher Vacuum for Better Physics

Empty space — that would be perfection to the RHIC Vacuum Group.

When RHIC, BNL's Relativistic Heavy Ion Collider, comes on line in 1997, heavy ions will speed in opposite directions around the two rings of the giant collider. Within the beam tubes making up those two rings, not only will the particles be traveling near the speed of light, but they will also be kept in an ultrahigh vacuum.

Guaranteeing RHIC's ultrahigh vacuum — which will be one of the highest vacuums within any accelerator in the world — is the job of the Vacuum Group. To achieve this, the dozen electrical engineers, mechanical engineers and technicians in the group are working at the cutting edge of vacuum technology.

Consider these numbers: BNL's Alternating Gradient Synchrotron is a high vacuum accelerator, operating in the range of about $5\times10^{-9}$ torr. That's about 7 billionths of an atmospheric pressure. As an ultrahigh vacuum machine, RHIC will operate with a pressure approximately 500 times lower than the AGS — in the range of $10^{-11}$ torr.

Says Kimo Welch, the group's supervisor, "Unlike any existing large accelerators, RHIC will accelerate very heavy ions. Because of their large size, heavy ions have a greater tendency to collide and be deflected from their orbit by gas molecules in the beam tubes. So for RHIC, an extreme vacuum is paramount."

Adds his deputy David Pate, "The higher the vacuum, the longer the beam lifetime. And the longer the beam lifetime, the better the physics."

Bldg. 820 is headquarters for the group, which also supports a no-frills vacuum facility in Bldg. 902 and a cryogenics test stand in Bldg. 835. Bldg. 820 is the showcase location, where the group maintains an experimental laboratory, with multiple stations for evaluating equipment, like gas analyzers, temperature sensors, ion pumps and various other instruments.

It's also where vacuum equipment and every inch of every beam tube will be tested for leaks before being incorporated into various-sized magnets. That's a tedious but critical

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**To ensure ultrahigh vacuum in RHIC magnets, every inch of every beam tube will be checked for leaks before being assembled into a magnet. Here, at a leak-check oven in Bldg. 820, are: (from left) Lorelie Smart, Robert Todd and Douglas Zigrosser of the RHIC Vacuum Group. The oven heats each beam tube to 250°C, which drives out any water or solvents that may be plugging pinholes in the tube. Then the tube is soaked in a helium environment for 10 minutes to check for leaks.**

# Northeast Partners Plan to Help DOE With Environmental Restoration

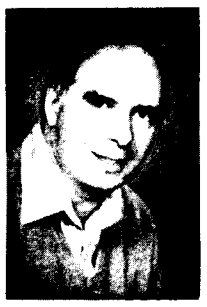
Roger Stoutenburgh

BNL hosted a two-day workshop, March 8-9, to begin organizing a northeastern consortium to aid the U.S. Department of Energy (DOE) in environmental restoration and waste management at its facilities nationwide.

Workshop speakers and attendees included: (seated, from left) Sara Demy, New York State Department of Economic Development; Romney Duffey, Chairman of BNL's Department of Nuclear Energy (DNE); Leon Petrakis, Chairman of BNL's Department of Applied Science; Ralph Dratch, Long Island Research Institute; (standing, from left) Sy Baron, BNL Associate Director for Applied Programs; Clyde Frank, DOE Deputy Assistant Secretary of the Office of Technology Development within the Office of Environmental Restoration and Waste Management; Peter Colombo, DNE; Peter Soo, DNE; Sheldon Reaven, State University of New York at Stony Brook; and Paul Piciulo, New York State Energy Research and Development Authority.

Initiated by Romney Duffey, the workshop was the first step in organizing a consortium comprised of four partners: the northeastern states, industry, academia and Brookhaven. While the focus of the effort is to identify and develop promising technologies for DOE use, such technologies would also be transferred to industry so that they would be generally applicable for environmental restoration at the state and local levels.

## Inside Info



**Michael Murtagh** became Deputy Chairman of the Physics Department, on March 1.

In announcing the promotion of his former Associate Chairman, Physics Chairman Peter Bond said, "Michael has been doing an excellent job of overseeing the high energy physics program, including the growing effort for the Superconducting Super Collider [SSC], and has been taking on an ever-increasing role in other Department responsibilities."

Murtagh holds a B.Sc. and M.Sc. in Physics from National University in his native Ireland. He came to the U.S. to continue his education in 1967, and received his Ph.D. in physics from Harvard in 1974.

Murtagh first came to BNL in 1970, as a guest junior research associate until 1973, when he joined the Physics Department staff as a research associate. He was named assistant physicist in 1975, associate physicist in 1977 and physicist in 1979, and received tenure in 1985.

In his first BNL research, Murtagh worked on neutrino bubble chamber experiments with Physics' Omega Group. In 1978, he joined the group's new Experiment 734 at the Alternating Gradient Synchrotron (AGS. This large neutrino experiment, which concluded in 1986, was designed to study elastic neutrino scattering from electrons and protons and to search for neutrino oscillations.

"At the time," said Murtagh, "it provided the best measurement of neutrino-electron elastic scattering, and its result is still the definitive measurement on neutrino-proton elastic scattering. Also, the oscillation limit determined by E734 remains the best available for small mixing-angle oscillation searches. It's an experiment that has withstood the test of time."

Since then, Murtagh has been "trying to find a way to continue neutrino physics here." These efforts panned out earlier this month with the approval of AGS Experiment 889, a search for neutrino oscillations that will be done by a collaboration including BNL, Los Alamos National Laboratory, TRIUMF and the University of Pennsylvania. Over these years, he has also been involved with proposals for detectors for both the national SSC and for BNL's Relativistic Heavy Ion Collider.

Of course, Murtagh's hands-on involvement with experiments has lessened since he joined Physics' administration in 1991. "The Department's goal is to do high-quality research," he says, "so, now, my primary job is to help ensure that such research gets done in a timely and effective manner."

## RHIC Vacuum (cont'd)

task, according to Robert Todd, a technical specialist, who points out that once a beam tube is enveloped in all the complex layers of a superconducting magnet, it is impossible to fix or replace without destroying the magnet.

Todd subdivides the vacuum requirements for RHIC into two regions: the cold bore, which runs through the superconducting magnets at the near absolute zero temperature of 4.2 kelvins, and the warm bore, which exists as room-temperature sections between strings of magnets.

In the cold bore, the concern is that helium, the coolant gas, may leak into the beam tubes, thereby disrupting the vacuum. "We looked into pumping the cold bore with sputter-ion pumps, which are commonly used in an ultrahigh vacuum environment," says Todd, "but we discovered that these pumps quickly became saturated with helium."

The solution was sorption pumps, making RHIC the first superconducting machine to use such pumps. When cooled to 4.2 kelvins, a sorption pump acts like a sponge in soaking up the helium.

In the warm bore, the main problem is that hydrogen gas diffuses out of the stainless steel tubes and other components residing within the warm sections. Here, the sputter-ion pumps worked well, particularly after a special shield was developed to absorb energetic neutral particles bouncing about within the pump body.

"The amazing thing is that, in 40 years, no one had ever quantitatively assessed how much helium and hydrogen these pumps pump," says Welch. "We set out to do this for RHIC, and it took about a year and a half."

Without question, the RHIC Vacuum Group knows its stuff, from doing detailed research and development work to digging constantly into references that include Welch's own 359-page text on vacuum technology.

Only a month ago, a two-day exhaustive review of the entire RHIC vacuum system was conducted by an international panel of experts. "They were favorably impressed," says Welch. "We now know we are on target." — Mona S. Rowe

## S5 Protein

the protein-making machinery.

Also, ribosomes are an ideal model in which to study how proteins and RNA recognize each other, an interaction that is important in many processes, Ramakrishnan said. For example, these kinds of interactions play an important role in the life cycle of RNA viruses such as the AIDS virus.

Ramakrishnan and White, as well as some other groups of biologists, are continuing to work on uncovering the structure of other ribosomal proteins and also understanding how these proteins bind to RNA. At BNL, Ramakrishnan will continue to be assisted by the "excellent contributions," he said, of the two associates working with him — Sue Ellen Gerchman, who helped clone the gene for S5, and Helen Kycia, who purified the protein to get crystals of it.

"We'll be busy — with over 50 ribosomal proteins and only a few known structures, there is plenty of work to do," concluded Ramakrishnan. — Liz Seubert

## At The BERA Store

The BERA Sales Office in Berkner Hall is open each workday between 9 a.m. and 1:30 p.m.— and offers many discounts on merchandise and services. So employees are invited to stop in to see what's new.

Now is the last chance to pick up discount books with coupons worth up to 50 percent off on Long Island dining and entertainment. Also available now are:

- **Tickets** — discount United Artist theater tickets, $5 each; twofers for some Broadway shows; flyers; wholesale club information; and more.
- **Merchandise** — photo processing; greeting cards; Long Island postcards; T-shirts, $7 each; sweatshirts, $13 each; assorted mylar balloons, $1.50 each; BNL postcards, buttons, mugs, hats.
- **Attractions** — free Magic Kingdom cards for Disney World, Epcot Center, Disneyland and MGM Studio, also good for a 10% discount at local Disney stores; discount cards for Sea World/Busch Gardens and Universal Studios; in season, tickets for Hershey Park, Sesame Place, Action Park, Great Adventure.
- **Participation Awards** — the Sales Office is the official redemption center for BERA Participation Awards, and new items will arrive shortly.

For more information call Carolann Zebrowski, Ext. 3347.

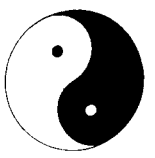
## Atlantic City Trip

The next BERA-sponsored, one-day trip to Trump Castle Hotel and Casino on the Marina in Atlantic City is on Saturday, May 1. The initial cost will be $20, but the casino will give a $7.50 coin return, and a choice of either $5 towards food or an additional $2.50 coin, and a $5 deferred-return voucher.

Tickets are on sale now at the BERA Sales Office in Berkner Hall, weekdays from 9 a.m. to 1:30 p.m. The bus will leave the Brookhaven Center promptly at 9 a.m., with an extra pickup at LIE Exit 63, if requested. Return will be about 11:45 p.m.

For more information, call Carolann Zebrowski, Ext. 3347; Rosalie Piccione, Ext. 3160; or M. Kay Dellimore, Ext. 2873.

## Tai Chi Club



As evidenced by a recent *Newsday* article, Tai Chi is flourishing on Long Island. And, BNLers may partake in the health benefits of this ancient form of exercise and meditation by joining the BNL Tai Chi Club.

The club follows the Yang long-form school, which consists of 88 postures practiced in slow, relaxed sequences. The complementary exercises PaKua and Pushing Hands may also be offered.

Three practices a week — Monday, Wednesday, and Thursday — are held from noon to 12:45 p.m., at the Brookhaven Center. The fee for three months, April-June, is $30, payable at the first practice. Prospective members are invited to observe or participate in a one-week, free trail.

For more details, call Gerard Tanguay, club secretary, Ext. 2198.

## New Pool Season

A new three-month pool season will begin on Thursday, April 1, and run through Wednesday, June 30.

Tickets may be purchased at the pool during open hours:

**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 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 permitted. Advance arrangements for additional guests, 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.*

The pool is closed on all Lab holidays.

## Water Aerobics

A 12-week session of water aerobics will start again on Tuesdays and Thursdays, beginning April 6 and 8, respectively, from 5:15 to 6 p.m., in the pool on site. Sign up now for Tuesdays or Thursdays, or both sessions. While the class is free, participants must either have a season pool pass or pay a $2 pool fee for each session.

For more information, call Health Promotion Specialist Mary Wood, Ext. 5923.

## Let's Dance

Members of the BNL Ballroom, Latin & Swing Dance Club are reminded that pre-registration for the next series of dance lessons — tango and Texas two-step — will take place next Wednesday, April 7, before and after the last class of the current series. Open registration will be held for new members before the first class on Wednesday, April 14.

The cost for the lesson series is still $15 per person; depending upon how many people sign up, the tango and two-step series will last six to eight weeks. Classes are held on Wednesday from 5:15 to 6:30 p.m. in the North Ballroom of the Brookhaven Center, unless members are notified otherwise.

Advance tickets at $20 per person remain available for the club's Swing Into Spring dinner-dance, on Friday, April 23, 6-11 p.m. For tickets, contact: Violet Bezler, Ext. 3771, Bldg. 510; Nelson Cause, Ext. 4999, Bldg. 134; Connie Economos, Ext. 2594, Bldg. 130; Jack Guthy, Ext. 4411, Bldg. 750; Ron Ondrovic, Ext. 4553, Bldg. 355; Nedy Santiago, Ext. 3402, Bldg. 701; or Liz Seubert, Ext. 2346, Bldg. 134.

## Cafeteria Menu

| | | |
|---|---|---|
| **Monday, April 5** | | |
| Soup: Chicken noodle | | .80/1.10 |
| Entree: Cheese ravioli marinara | | 3.35 |
| Lite Choice: Scrod New England-style | | 3.65 |
| Carvery: Hot pastrami sandwich | | 2.95 |
| Grill: Pacific mahimahi w/Creole rice | | 3.95 |
| Taster's Bar: Chicken nuggets | (oz.) | .25 |
| **Tuesday, April 6** | | |
| Soup: Potato cheddar | | .80/1.10 |
| Entree: Eggplant Parmesan | | 3.25 |
| Lite Choice: Baked herb chicken | | 3.45 |
| Carvery: Hot roast beef sandwich | | 2.95 |
| Grill: 8-oz. Club burger w/fries & soda | | 3.25 |
| Taster's Bar: Hot wings | (oz.) | .25 |
| **Wednesday, April 7** | | |
| Soup: Three-bean | | .80/1.10 |
| Entree: Steamed knockwurst & cabbage | | 3.35 |
| Lite Choice: Lemon-pepper catfish fillet | | 3.85 |
| Carvery: Hot ham sandwich | | 2.95 |
| Grill: Salmon steak w/fried sweet potato | | 3.95 |
| Taster's Bar: Mini pepperoni pizzas | (oz.) | .25 |
| **Thursday, April 8** | | |
| Soup: Potato kale | | .80/1.10 |
| Entree: Cheese tortellini Parmesan | | 3.35 |
| Lite Choice: Bounty vegetable beef stew | | 3.65 |
| Carvery: Hot corned beef sandwich | | 2.95 |
| Grill: Oriental yellow tuna steak | | 3.95 |
| Taster's Bar: Fried chicken wings | (oz.) | .25 |
| **Friday, April 9** | | |
| Soup: New England clam chowder | | .80/1.10 |
| Entree: Kielbasa w/sauerkraut | | 3.35 |
| Lite Choice: Fresh catch of the day | | 3.85 |
| Carvery: Hot turkey sandwich | | 2.95 |
| Grill: Tuna melt platter | | 3.25 |
| Taster's Bar: Seafood nuggets | (oz.) | .25 |

**Movie Night . . . Brookhaven Center**
Wednesday, April 7 . . . 8 p.m.
*Mr. Baseball* . . . free popcorn!

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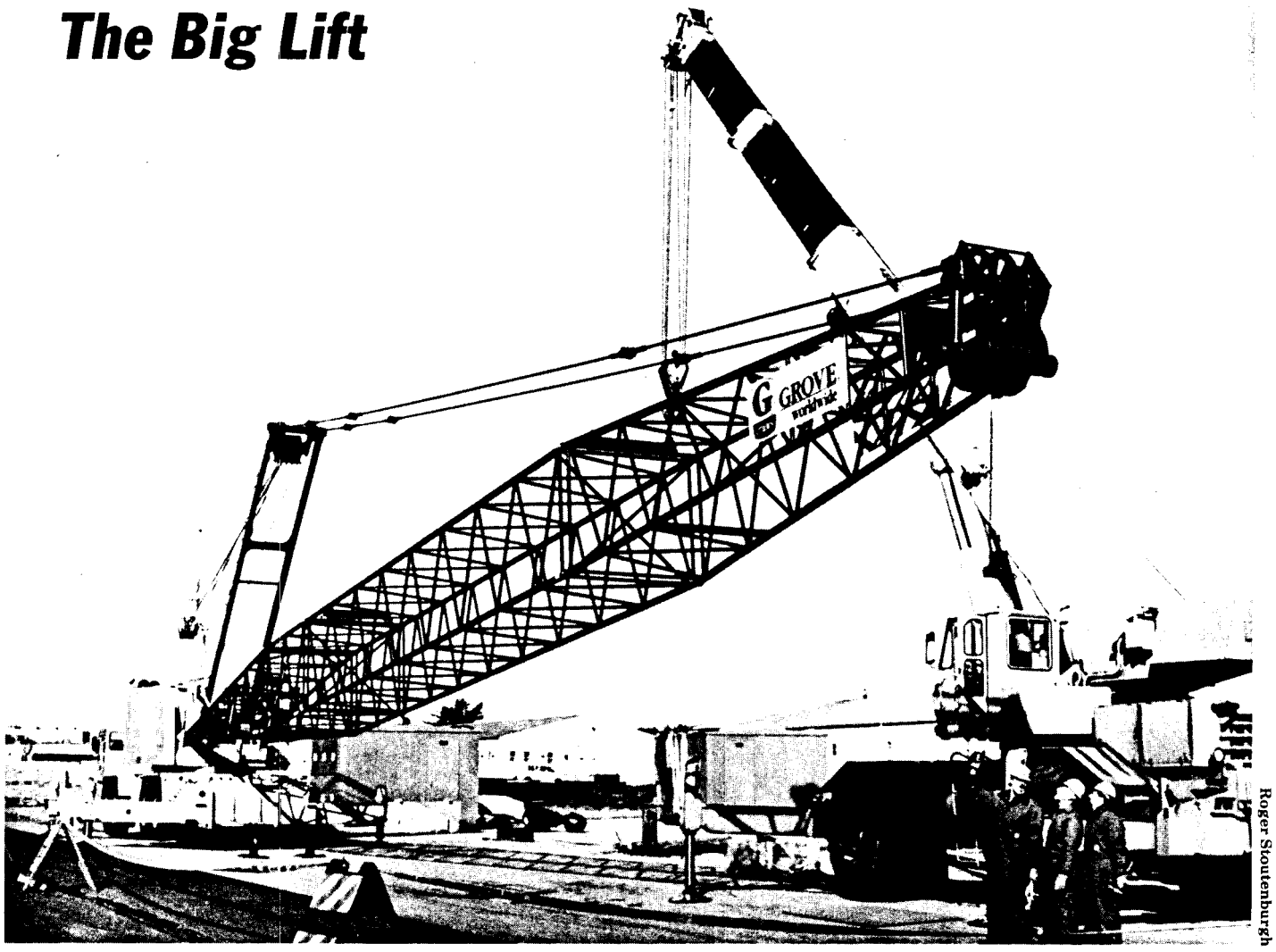
ANITA COHEN, Editor
MARSHA BELFORD, Assistant Editor

35 Brookhaven Ave., Upton, N.Y. 11973
(516) 282-2345

# The Big Lift




Roger Stoutenburgh

Since the Lab's physics accelerators, experiments and their related equipment keep getting bigger and bigger — and heavier and heavier — a very large and mobile crane is necessary to move them into position at the Alternating Gradient Synchrotron (AGS) and, soon, at the Relativistic Heavy Ion Collider (RHIC).

To meet the demand of these loads, a 135-metric ton (150-ton), lattice-boom crane manufactured by Grove Industries of Pennsylvania was delivered in February along with three flat-bed trucks loaded with boom sections and counterweights to the Site Maintenance Group (SMG) of the Plant Engineering (PE) Division.

After assembling the crane in two days, the Lab's 14 heavy equipment mechanic operators put the Grove through its paces, to check out the crane and to get familiar with its operation and maintenance.

With the crane formally accepted, it is now hard at work on its first job at Bldg. 919: lifting the world's largest superconducting magnet coils making up the magnet to be used in AGS experiment 821 on muon magnetism.

In putting the new crane together, the HEMOs called upon the Lab's former heavyweight champion: the PettiBon hydraulic boom crane. In the photo above, the assembly of the lattice boom of the new 135-metric ton Grove crane is seen being completed, using the old 58.5-metric ton (65-ton) PettiBon, under the supervision of Heavy Equipment Mechanic Operator Group Leaders: (from left) Michael Curtis, Charles Botts and Kevin Barnes. Curtis has the lead responsibility for the new crane's operation and preventive maintenance.

By nearly four to one, the Grove crane can outlift the PettiBon. Though rated at 58.5 metric tons, the maximum that the hydraulic crane can lift safely is 36 metric tons (40 tons), with the boom as vertical as possible.

An on-board computer that weighs each load is one of the features that makes this crane especially safe and relatively easy to operate. With advance warning, the computer will automatically shut down the crane if the lift exceeds the crane's capacity.

While one heavy equipment mechanic operator is needed to operate the Grove, two are required when moving the crane from job to job, one to drive the nine-speed truck and the other to mind the boom.

Purchased for $708,000, this model was selected by a committee of representatives from the AGS Department, RHIC Project and PE. They included: cochairmen Leonard Chimienti, AGS, and Roy McWilliams, PE; Roy Barone, PE; Charles Botts, PE; Nicholas Cipolla Jr., PE; James Mills, RHIC; Michael Curtis, PE; Edward Miezianka, PE; Alexander Pendzick, AGS; and George Wunderlich, PE.

**Film badges will be changed tomorrow. Please place your badge in its assigned rack space before leaving work today.**

## Road Closing

The section of Bell Avenue adjacent to the tennis courts will be subject to closing April 5-9, to allow underground utilities to be installed.

## Microwave Oven In Cafeteria

In response to requests from Lab employees, a microwave oven will be installed in the Cafeteria, adjacent to the cashiers' stations, on a trial basis, effective Monday, April 5.

Employees may use the oven to heat items brought from home or purchased in the Cafeteria. Those who use the microwave oven, however, must become familiar with posted use instructions, clean up spills to maintain the cleanliness of the cooking area, and provide their own plates and utensils.

At the trial's end, this service will be reviewed. If problems involving abuse of the microwave or cleanliness of the surrounding area have developed, it may be necessary to remove the oven. Therefore, everyone's cooperation will be appreciated.

## Art Bus Trip To Philadelphia

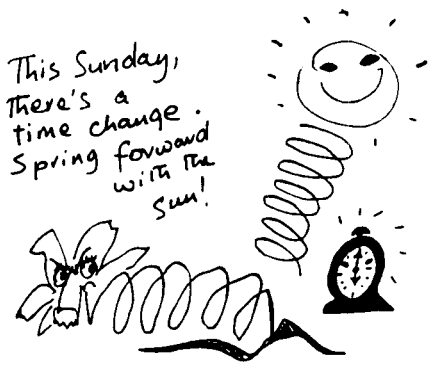
On Saturday, May 22, join the BERA Art Society's bus trip to Philadelphia — see stunning impressionist Camille Pissarro's romantic Paris paintings and visit the nearby Rodin Museum for magnificent sculpture. After lunch, take a springtime walk down the oldest street in the U.S., see Betsy Ross's house or the Liberty Bell — as you like.

Bus tickets are $20 each, while guided tours to the Philadelphia Museum of Art and the Rodin Museum combined are $15. The bus will leave BNL at 6:30 a.m. and return around 9:30 p.m. For tickets or information, call Liz Seubert, Ext. 2346.

## Software Course

The Computing & Communications Division (CCD) has scheduled a Solaris system-administration course for the week of April 26. Seats are limited and will be reserved on a first-come, first-served basis, with an ILR in the amount of $200.

This course is intended to provide a contrast between two system administrations — Solaris 2.1 and SunOS 4.1.X — with emphasis on those aspects that have changed. For information or to register, call Ron Wittlock, Ext. 4112, or E-mail, wittlock@bnl.gov.




## BERA Broadway Trip To *Les Miserables*

For the perfect graduation gift or the excitement of Manhattan without any transportation hassle, sign up for the BERA-sponsored bus trip to New York City to see the Broadway show *Les Miserables*, on Saturday, June 26.

The cost of $119 per person includes: round-trip bus transportation, brief tour of South Street Seaport, an orchestra seat to the matinee performance of *Les Miserables*, full-course dinner at Cafe 44 Restaurant, and all taxes and tips.

Review a sample menu and/or make reservations now with a $50 deposit at the BERA Sales Office in Berkner Hall, weekdays, 9 a.m. to 1:30 p.m. The balance is due by May 21.

For more information, call Carolann Zebrowski, Ext. 3347, or M. Kay Dellimore, Ext. 2873.

# Arrivals & Departures

**Arrivals**

**Charles De La Parra**.....RHIC
**Kazuma Hirota**.....Physics
**Robert J. Michnoff**.....RHIC
**Joseph Montalto**.....Reactor
**Ilya R. Vasil'ev**.....App. Science
**Maria L. Wagner**.....Saf. & Env. Prot.
**Zhengyu Zhang**.....App. Science

**Departures**

**None**

# Softball

Softball captains' meetings will be held at noon in Room C, in Berkner Hall, as follows:

- **Employees Leagues** — Tuesday, April 6
- **Mixed Leagues** — Thursday, April 8

All official rosters and league fees of $300 per team must be turned in during these meetings. If you are looking for a team on which to play, call Denise Miesell, Ext. 5873.

# Bowling

**Red/Green League**

R. Mulderig bowled a 234/227/211/672 scratch series, B. Erickson 234/226/209/669 scratch, J. Muller 227, H. Arnesen 222/201/604 scratch, A. Warkentien 214, S. DiMaiuta 213, R. Jones 213, K. Koebel 211, E. Sperry IV 208, H. Dawson 204, R. Raynis 204, F. Griswold 203, K. Asselta 200, R. Larsen 200.

**Purple League 3/18 & 3/25**

Ed Beadle bowled a 214/203/593 scratch series, Jeanne Penoyar 213, Ed Sperry IV 210, Sharon Smith 200/543 scratch, Jim Good 200, Kevin Carney 194/191, Pete Stemaschuk 184, Dawn Mosoff 182/176. Steve Gushue converted the 3-7 split, Ed Sperry IV the 5-7, Lorraine Roecklein the 4-5-7, Denise Monteleone the 5-8-10.

**White League**

Jim Petro bowled a 241/577 scratch series, Sam Logan a 240, Ray Raynis 227/609 scratch, Pete Wynkoop 204/581 scratch, Mike Meier 201/582 scratch, Tom Romano 200/556 scratch, Pat Bounauito 198, Norman Besemer 197/181, Joe Mayeski 193, Dennis Klein 192, Brian McCarrick 191, Ron Dobert 185, Frank Dusek 182, Brian McCarrick 181. Ed Sperry converted the 4-7-9-10 split.

# U. of Chicago Has Opening at NSLS

Full-time appointment available for an engineer/physicist to maintain and operate an x-ray beam line at the National Synchrotron Light Source through the University of Chicago. Requires B.S. or M.S., experience in mechanical design and construction, electronics repair, and computer workstation administration. Will provide technical assistance to visiting scientists. Requires good communication skills and ability to work independently. Contact Mark Rivers, Ext. 7708 or 5626.

# 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.

**SCIENTIFIC RECRUITMENT** - Candidates may apply directly to the department representative named.

POSTDOCTORAL RESEARCH ASSOCIATES - (two positions) trained in physics, to join a broad-based research program in condensed matter theory. Research interests of the group include theory of high-temperature superconductors, self-organized criticality, and electronic structure of alloys and surfaces. Contact: J.W. Davenport, Physics Department.

**OPEN RECRUITMENT** - Opportunities for Laboratory employees and outside candidates.

NS 6154. ADMINISTRATIVE POSITION - Requires a bachelor's degree in business or a scientific discipline, significant experience in the development and implementation of administrative procedures, and demonstrated experience in overseeing a complex variety of administrative functions within a scientific environment. In addition, requires technical writing experience, knowledge of computerized databases, and excellent oral communication skills. Knowledge of Laboratory policies and procedures highly desirable. Will be responsible for managing the User Administration Office and administering the user program within Department. National Synchrotron Light Source Department.

## Motor Vehicles & Supplies

89 CADILLAC ELDORADO - silver w/black leather int., 57.6k hwy. mi., incl. phone, mint cond., $12,990. V. Mott, Ext. 7108.

89 DODGE GRAND CARAVAN - 7-pass., V-6, a/t, ac, p/s, p/b, clean, recent tune-up, make offer. Tom, 399-6698.

89 JEEP WRANGLER - 6-cyl., a/t, 2 tops, white, $8,000 neg. M. Hamilton, Ext. 4666.

88 HARLEY DAVIDSON SPORTSTER MOTORCYCLE - extras, $4,200; '84 T-Bird, ac, p/w, p/b, p/s, 3.8L motor, new tires. Bob, 369-4624.

88 NISSAN 4x4 - p/s, p/b, extras, good cond., must sell, $7,500 neg. Fran McKenna, 369-9062.

87 CAMARO - ac, a/t, alarm, blue/black int., orig. owner, excel. cond., $3,900. 874-3796.

87 HONDA CIVIC CRX - 5-spd., V-4, m/t, ac, 85k mi., runs well, $3,300. Wei, Ext. 4454 or 345-5248.

87 MAZDA B2000 PICKUP - 50k mi., 5-spd., cap, liner, new tires, brakes, recent Mazda major service, $3,200. Dave, Ext. 7268.

85 BUICK LESABRE - V-8, 4-dr., ac, p/s, p/b, am/fm, new brakes, shocks, good running cond., $1,800. Lew, Ext. 5193 or 928-4863.

84 MERCURY TOPAZ - 5-spd., runs well, $650 neg. Mike, 929-8443.

81 VW RABBIT - convertible, fun to drive despite high mileage, asking $1,300. Genie, 286-2267.

78 CHEVY MONTE CARLO - 350 motor, clean, asking $1,400. Steve, Ext. 3849 or 929-0586.

77 OLDS DELTA 88 - runs well, reliable, 2 new front tires & battery, $350. Frank, Ext. 3531.

77 WINNEBAGO MOTOR HOME - 25', Chevy chassis, 350 V-8, very clean, v.g.-excel. cond., asking $8,000. Tony, 727-3863.

68 MUSTANG - red, 302 V-8, rebuilt trans., battery, brakes, shocks, exhaust, am/fm cass. Clarion, must sell, $2,500. 399-2179.

65 MORRIS ENGLISH MINI COOPER S - right side drive, red/black, real pussycat, come see, price ? Wilma, 924-3236.

CAP - 7½'x5', Macho Leer, fg, black tinted, sliding side windows; 4 tires, Firestone blackwalls, 225/70/R15, used 100 mi., best offer Steve, 929-4787.

MOTOR - '79 Jeep, runs well, will demonstrate, best offer. Dennis, 744-3342.

RIMS - ARE alum. directional, 6-lug Chevy truck rims, 4, center caps & lugs, orig. $135 ea., now $125 takes all. John, Ext. 5565.

## Boats & Marine Supplies

21' CHRIS CRAFT - 1988, Bowrider, i/o Merc., 8'6" beam, canvas, am/fm, bottom not painted, E-Z Load trailer, $11,500. 732-8793.

14' HOBIE CAT - turbo, w/roller reefing jib, trailer. Ext. 7657 or 298-9560.

OUTBOARD - 1976, 9.9-h.p. Johnson. Bob, Ext. 4615 or 325-8658 after 6 p.m.

MAST/BOOM - 22'8"/10'2", aluminum stainless steel rigging, $200. Ron, Ext. 4112.

## Furnishings & Appliances

BATHROOM MIRROR - Colonial, 36"x32", tri view, 36" five bulb light, v.g. cond., $75. Rich, 475-0373.

BAR - 60"x24", pine, w/fruitwood stain, 3-bulb light w/stained glass, gold & green bar mirrors, $150 all, bar only, $100. Grace, 979-0597.

BEDROOM SET - oak, bunk bed, desk w/hutch, and night table, $350, 6' drafting table, $150. Terry, 499-8377.

CEILING FAN - small, 4-blade white fan, no light, good cond., great for bedroom. Kathy, Ext. 2267 or 395-6520.

COMPACTOR - garbage, heavy-duty, $60. Ext. 7699 or 821-1435.

COUCH - gray Rowe sectional w/chaise, like new, orig. $1,200, asking $450. 821-2886.

CRIB - changing table & 3-drawer dresser, $100. Lou, 928-7042.

DINING ROOM - 42"x86" table w/2 leaves, 60" china closet, 62" buffet server, 6 chairs, table pads, $700 or best offer. Joan, 331-9264.

DINING ROOM SET - large table w/3 sections, 6 chairs, plus hutch, excel. cond., $600. 924-0960.

FURNITURE - Colonial sofa, loveseat, 2 end tables, coffee table, $450; pedestal kitchen table & leaf, 4 chairs, $200. Rich, 475-0373.

MAPLE TABLE - $20; tennis rackets, $15/ea.; twin comforter, $10; mower, $35; Polaroid camera, $20; old wood crates, $20. Kathy, 744-2203.

KITCHEN STOVE - old, cast-iron; fiberglass stall shower, gold; 16' alum. garage door; cast-iron radiators; solar heating unit, complete. Ext. 7148.

RANGE - Caloric, 4-burner, natural gas, double door cabinet, w/sliding shelves, 30"W x 24"D x 36"H, $50. Vita, 277-0464, or Frank, Ext. 7519.

REFRIGERATOR - side-by-side, 35½"W, white, self-defrost, icemaker, $350; washer & dryer, $65/ea., $100/pair. Steve, Ext. 3100 or 878-4880.

RUG - Navajo, all natural, made in New Mexico. Lena, 341-1006.

SOFA BED - blue/gray, great cond., $295; ping-pong table. Mary, 924-6235.

**The Brookhaven Bulletin is printed on paper containing at least 50 percent recycled materials, with 10 percent post-consumer waste.**

STOVE - gas, almond, Kenmore, double oven, top & bottom,. $250 neg. Ext. 7238.

TABLE - Bennington, round, pine, w/2 leaves, 48", entends to 72", 8 chairs, lazy susan. 286-1214.

WATER BED - queen size, waveless, wood headboard, $100. Cindy, 874-3652.

## Tools, House & Garden

ROTOTILLER - '78, Troy-Bilt, 6-h.p. model, runs well, $450. Mike, 941-9283.

SPRUCE TREES - Norway, white, blue, Douglas fir; 4-6', balled, burlapped, 35 avail., $40/ea. Tom, Ext. 4507 or 878-1060.

STORM DOOR - 30"x80", brown, cross buck, new, half-price, $75. Janet, Ext. 4049.

## Sports, Hobbies & Pets

BOW - Hoyt Supreme, new, 30", draw sight, arrow rest, Hoyt quick release quiver, arrows, orig. $450, asking $250. Emil, Ext. 4289.

CAMERA - Pentax 1000, 35mm, w/zoom lens, flash, carry case, $125. Kathy, Ext. 2267 or 395-6520.

DOVES - pair, beige w/gold, black cage, $100. Kelly, 744-3069.

DRUM SET - $60; ping pong table, $35; karate sparring equipment, new, never used, $110. Terry, 499-8377.

HORSES - 10 yr. gelding reg. QH, $1,600; 9 yr. mare QH type, $1,200, neg. Beth, Ext. 4986 or 369-4295.

JACK LALANNE MEMBERSHIP - Premier plus, good for any club, $35 for 2 yrs., $5/mo. after. Sue, Ext. 4461.

MODEL RACING CAR TRACK SET - Tyco Magnum 440-X2, $35; operating visible model engine kit, $15. Tom, Ext. 4507 or 878-1060.

ORGAN - Hammond, solid state console, autocord, auto rhythm, excel., $500. portable piano, Yamaha, XPR-1, w/stand, $100. Ken, Ext. 5363.

ORGAN - Hammond 227 Aurora spinet, walnut finish, mint cond., must see. 698-9165.

RACING COLLECTIBLES - die-cast, cars, trucks, 1/64 replicas, Win Ross, RCTI, RCCC. Joe, Ext. 5320.

STAMP COLLECTION - 35 albums, 60k w.w., F.D.C., U.S., cell. protective pages, cat. value $12,000, sell at $4,000 firm. Ext. 5054 or 286-5897.

STAR TREK VIDEO TAPES - collector's edition; collector plates; orig. & 25th anniversary. Mary, Ext. 2815 or 472-4087.

WHEEL SET - Tubulars Mavic; Scotts & Ritchey handle bar; Modolo & Ritchey stems; Campy Delta brakes. Oscar, Ext. 3499.

## Audio, Video & Computer

CELLULAR PHONE - Pulsar w/battery, AC adapter, carry case. Kathy, Ext. 2267 or 395-6520.

CELLULAR PHONE - Motorola bag phone, antenna, charger, battery, w/Cellular 1 service, $39.99/mo., ½ yr. free airtime, $50. Ray, 325-2145.

COMPUTER - XT compatible clone, 640k RAM, two 360K FDD, M/C monitor, best offer. Jim, Ext. 5684.

ENTERTAINMENT CENTER - 6'x3'x2', radio, phono, TV space, storage, speakers, maple, $150; hutch, pine, new cond., $350. 744-3842.

MOVIE PROJECTORS - Bell & Howell, dual 8, $15; 8mm, $10; silver screen, $15; Pioneer stereo, turntable, PL-2, $20. Ext. 2679 or 472-6922.

NINTENDO SYSTEM - $45; power gloves, $30; max control, $20; $85/all; games, $15/ea., $40/three. Ext. 7505.

NINTENDO SYSTEM - basic unit, Super Mario 3, $60. Alex, Ext. 3723 or 341-1018.

STEREO - JVC car stereo, am/fm cass., like new, $100. Emil, Ext. 4289.

## Miscellaneous

FORMULA - 1 case Similac w/iron, 13 oz. concentrate liquid, reg. $57, sell for $40. Janet, Ext. 2345.

GAS STOVE - Caloric, 3 yrs. old, v.g. cond., almond, $175. 265-4572.

MAGAZINES - new, *Shelter/Practical Homeowner*, 1980-89, best offer. Pete, Ext. 7955 or 929-3847.

RING - engagement, diamond, 14k gold, $550 or best offer. Shawn, Ext. 5741.

RING - new, 14k yellow gold, engagement style w/white topaz, 1.25 total weight, size 8, $150. Ext. 2671.

SPA - Coleman, 5-person, hot tub, 2 yrs. old, excel. cond., 120/220 hookup, filter, chemicals. Ext. 2080 or 473-1067.

TABLE - drafting, 38"x60", wood, tilt top, adjustible, mech. arm, $50 neg. Steve, Ext. 2175.

TICKETS - 2, for BERA-sponsored trip to *Miss Saigon*, Sat., 4/24, $119/ea., matinee, dinnner at Cafe 44, transportation incl. Stas, Ext. 7849.

TICKETS - 2, for BERA sponsored trip to *Miss Saigon*, Sat., 4/24, $119/ea., matinee, dinnner at Cafe 44, transportation incl. Adams, Ext. 5221.

## Free

PHONO PARTS - speakers, etc. Janet, Ext. 2345 or 929-3910.

## Wanted

BACKBOARD - basketball, with or without rim. John, Ext. 4666, lunchtime.

BOAT - 14' aluminum, cheap or trade for 12' boat. Bob, 369-4624.

BOAT - Steigercraft 21', Chesapeake or equivalent outboard w/trailer, no more than 4 yrs. old. 286-1214.

HEATER - kerosene, blast-type. Ext. 2172 or 744-4386.

HOST FAMILIES - for foreign exchange students for summer and year programs w/the American Intercultural Student Exchange. Lori, 369-7809.

HOUSING - 2 or 3-bdrm. apt. or house, to rent from 6/14-7/4. Ext. 3857.

OLD FOUNTAIN PENS - cash paid. Catherine, 744-3383.

PAINTER - for interior work. 744-5801, leave message.

PRINTER - used, laser, inkjet, bubblejet or 24 pin, must be in good cond., some scalable fonts a plus. Talat, Exzt. 3852.

RAFTERS - for bus trip to Penobscot, Maine, 6/12-14. Sue Norton, Bldg. 830.

SUNFISH - or laser, cheap OK if they need work, to be used for sailing program. Phil, Ext. 2080 or 473-1067.

## Services

*Services are listed in the first **Bulletin** of every month as a courtesy to BNL employees. They are neither screened nor recommended by the **Bulletin**. Services forms are available in the **Bulletin** lobby, Bldg. 134.*

AIR CONDITIONING - installation & service, expert quality w/lowest rates, free est. & survey, spring specials. John, 467-5827.

BABY-SITTER - mature high schooler seeking steady after school & weekend hours, avail. ASAP. 399-2179.

BRICKWORK - masonry, patios, walks, swimming pools, retaining walls, landscaping ties, Belgium block, 25 yrs. exp., Lab disc. Tony, 698-9274.

CARPENTRY/CONSTRUCTION - dormers, extensions, fin. bsmt., garages, roofs, sheetrock, excel. work, free est. Dennis, 395-6055.

CARPET/UPHOLSTERY CLEANING - spot, pet stains, odor removal, auto interior, fabric protector, free est., Lab discount. Jerry, 924-6019, days.

CATERING - home cooking, homemade pastas & all types of other dishes, cater any occasion, call for menu/est. Luisa, 395-6055.

CHILD CARE - experienced mother of 2½ yr.old in my home, indoor/outdoor play, snacks & meals provided. 369-7704.

CHIMNEY CAPS - fireplace, wood, coal & oil flues, custom-made for pre-fab oil flues, stainless steel lifetime guarantee. Mike, 821-5526.

COUNSELING - experienced, licensed, social worker will help w/individual, marital or family problems, insur. reimbursable. Linda, 929-5860.

DJ/MC - party & dance music from 40s-90s, all occasions, music & entertainment personalized for your affair, BNL refs. Lou, 698-8210.

DOORS - & windows installed, + all phases of carpentry work done, free est., prompt & reliable service. Philip, 369-9610.

DRYWALL - spackle, paint, int./ext., renovations, windows, doors, roofing, decking, fast, clean, reasonable, free est., insured. Scott, 325-0706.

ELDER CARE - will clean home, go/take shopping, doctor, barber/hair salon, etc., reliable. 399-4169.

FLOORS - waxing, stripping, carpets & upholstery shampooed, house cleaning, windows, free est. Leo, 447-6522.

JUNK REMOVAL - cars, trucks, machinery, free. Rich, 589-9103.

KAYAK LESSONS - basic & intermed., 6 wks., Sat. 7-9 p.m., course starts 4/17, SUNY Stony Brook pool, equip. supplied. Ernie, 281-7873.

LAND CLEARING - using excel. rake on 450 loader, $70/hr. w/operator. Tom, 878-1060.

LAWN SPRINKLERS - automatic, free est., prof. layouts, repairs, alterations & additions, prompt courteous service. Lou, 928-7042.

LOCKSMITH - sales & service, 10% Lab discount, keys cut during lunch. Pete, 399-2813 after 5 p.m.

MAILBOXES - post or house styles, custom-made, heavy gauge steel or wood, free catalog, many styles, Lab disc. Mike, 821-5526.

PAINTING - interior/exterior, taping, spackling, wallpaper, stain, polyurethane power washing, gutters, roofing, refs., ins. James, 399-4912.

PARTY TENTS - we set up & take down. For info, Fred Kuehl, 588-2268.

PET GROOMING - dogs, cats, rabbits, ferrets, all breeds, also training, disc. rates. 369-7704.

PLUMBING & HEATING ALTERATIONS - repair work by retired BNLer . Jim Morris, 472-1205.

POOL SERVICE - quality workmanship, summerizing, winterizing, weekly maint. & vacuuming. 654-5975.

POOL TABLE RECOVERY & REPAIR - choose from 27 custom colors. Philip, 369-9610.

POWER WASHING - decks, cedar shakes, brick, roofs, driveways, pool areas, vertical cedar siding, more, free estimates. John, 727-1140.

SHEETROCKING & SPACKLING - free est. Kevin, 563-9855.

SKYLIGHTS - complete, prof. service, cleaning, preventive maint., installations. Joseph, 924-6019.

TAXES - and bookkeeping service. Loretta, 929-8287.

TAXES - prepared by tax consultant, your home or mine, reasonable, servicing Lab people for over 15 yrs. John, 732-2472.

TRANSLATION SERVICES - Russian-English and English-Russian, also Russian lessons available on site, time flexible. Anna, 588-1014.

TREE WORK - 281-2746.

TRUCK & BOAT LETTERING - paint, vinyl or gold leaf, also magnetic signs, custom logos, etc. Mike, 821-4083.

VIDEOGRAPHER - capture those precious moments on video, will tape weddings, parties, all occasions, Larry, 281-7240.

WOODWORKING - custom design, yours or mine, for kit. cabinets, tables, dressers, bookshelves, etc. Phil, 722-3010.

WORD PROCESSING - manuscripts, resumes, term papers, database, mailing lists/labels, editing, overload work. Janice Lamb, 589-2848.

## In Appreciation

Special thanks to all in Plant Engineering who expressed their sympathy over the loss of my father. —Patrick Glennon

Two damsels in distress would like to thank Anthony Kalisak for his assistance on the LIE 2/10. —Terri & Denise

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