## BROCHHARD BULLETIN Vol. 54 - No. 30 BROOKHAVEN NATIONAL AUGUST 25, 2000 LABORATORY

# **Promising New Method to Clean Cadmium From Soil**

Method combines chemical treatment, 'pollutant-busting' bacteria

Y esterday, at a morning session of the 220th national meeting of the American Chemical Society in Washington, D.C., Murthy A. Vairavamurthy, Environmental Sciences (ES) Department, presented data on a promising method for combining chemical treatment with "pollutantbusting" bacteria to remove cadmium from contaminated soil.

"Environmental contamination by heavy metals such as cadmium is a serious and growing concern," says Vairavamurthy. He has been looking for ways to improve cadmium cleanup, together with Pramod Sharma and Yujun Yin, both formerly of ES; Anatoly Frenkel, a research collaborator in ES from the University of Illinois; David Balkwill, Florida State

Cadmium: highly toxic, carcinogenic, used in metal plating, nickelcadmium batteries, pigments, plastic stabilizers, pesticides, and more.

University; and Jan Kieleczawa, formerly of BNL's Biology Department.

Papers coauthored by Sharma, Balkwill, Frenkel, and Vairavamurthy appeared in recent issues of *Applied and Environmental Microbiology* and *Marine Chemistry* describing their findings. Cadmium is a highly toxic and carcinogenic metal used in metal plating, nickel-cadmium batteries, pigments, plastic stabilizers, pesticides, and more. It is most toxic in its free (ionic)

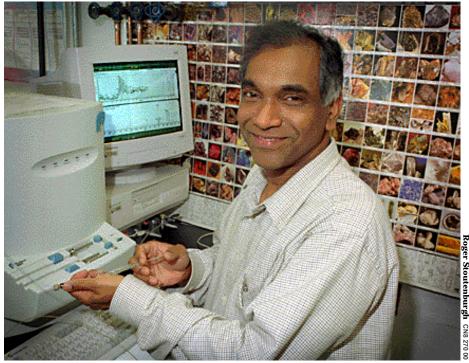
To find ways to treat cadmium-contaminated soil, the team at BNL looked for clues from nature.

form, which easily dissolves and moves through water, threatening groundwater supplies.

There are two basic ways to deal with soil contaminated with such toxic heavy metals, Vairavamurthy says. One is to mobilize the metals so they can be extracted from the soil and treated. The other is to convert the metals to a stable form that will not migrate into groundwater. To find ways to achieve one or the other, the team at BNL looked for clues from nature.

"Many organisms use thiols organic sulfhydryl compounds — to detoxify metals in the body," Vairavamurthy says. Many thiols form soluble complexes with toxic metals, which can then be excreted. "We thought these might work in soil as well."

The team was also intrigued by the natural ability of many microbes to detoxify contaminants. "Bacteria have versatile biochemical mechanisms, which we thought we might be able to exploit intelligently," Vairavamurthy explains.



Murthy Vairavamurthy, Environmental Sciences Department, injects a sample into a mass spectrometer to determine the types of cadmium complexes present.

In the end, the team has proposed a method that combines both approaches: First, thiosulfate, an inorganic compound with a sulfhydryl group, is injected into the subsurface soil. Thiosulfate has an affinity for and forms highly soluble complexes with cadmium. Then, when water is pumped out of the soil, the dissolved cadmium thiosulfate should come along for the ride.

The extracted water then can be treated with a new form of bacteria, the Cd-1 strain of *Klebsiella planticola*,

which was recently isolated by Sharma from coastal salt marshes on Shelter Island in New York. Through its normal metabolic process, the bacterium converts dissolved cadmium thiosulfate to cadmium sulfide, an insoluble form, which precipitates out of the solution.

Alternatively, the bacteria could also be injected directly into the soil following thiosulfate injection to complete the process *in situ*. This would leave insoluble cadmium sulfide in *(continued on page 2)* 



At an informal celebration held at the Brookhaven Center last week with Laboratory Director John Marburger (center, front) are some of the 60 BNL employees recently recognized by DOE for their contributions to pollution prevention.

O n Wednesday, August 16, more than 60 BNL employees working on five environmental projects were recognized for their dedication and leadership in contributing to DOE's mission to prevent pollution in BNL's operations, processes, and programs. All participants received certificates of appreciation signed by Secretary of Energy Bill Richardson.

At a wine and cheese party held at the Brookhaven Center to celebrate the occasion, Laboratory Director John Marburger offered his congratulations to the five project representatives and their teams.

"I am tremendously impressed with the amount of activity that has taken place over the last two years in the areas of environmental protection, pollution prevention, waste management, and a number of other environmental issues," he said. "Initially, I thought we were going to have problems addressing these issues, but we are privileged to have so many people working so hard to make these difficult jobs easier." George Goode, BNL's Pollution Prevention Coordinator, presented the DOE certificates to participants in the following projects: BNL Recycling; Hot Cell Redesign; Low-Flow, Low-Purge Well Sampling; Preventing Pollution: Past, Present, and Future; and the RHIC Environmental Management System Implementation.

The BNL Recycling Team was cited for recycling everything from cans, bottles, cardboard, and metals to batteries, tires, and oil. BNL, the Town of Brookhaven, and several local vendors have formed a symbiotic recycling partnership, saving the Lab hundreds of thousands of dollars per year in potential disposal costs. Recent additions to BNL's recycling program include spray cans, construction waste, and even demolition material.

Certificates were awarded to the team that redesigned the Waste Management Division's "Hot Cell," which provides the site with a state-of-theart means of managing high activity wastes. The redesign incorporated *(continued on page 2)* 

Brookhaven Semester Program, which

gave opportunities to minority students, and the Honors Students Program.

Then, three years after OEP had

been established under Donald Metz

in 1985, Swyler joined the staff there

as a scientist. He specialized in pro-

grams that encouraged interacting

with science teachers, particularly pro-

grams that brought teachers into re-

in the Introduction to Computers course offered by BNL in partnership

with several local school districts and

community organizations, with emphasis given to minority students.

In October 1993, Swyler was ap-

pointed OEP Manager, following his five-month service as Acting Manager

after Metz's retirement. OEP, in col-

laboration with other BNL organiza-

tions, provided educational services to

about 4,000 people annually through

more than 20 science education pro-

grams for students and teachers, from elementary to postgraduate levels.

the way science and math is taught

and learned led him to create innova-

tive ways of sharing the excitement

and interest he felt should always be

part of science education. He is cred-

ited with starting up BNL's very popu-

lar "Whiz Bang Science Show," now a

key attraction of the Lab's Summer

Sunday visits for thousands of chil-

to assist Hofstra with a Maglev com-

petition started by the University (see

Maglev story, page 3). The Maglev

contest became an annual event at

BNL, bringing many science teachers

Swyler is survived by his wife Patricia

and daughters Karen and Erica.

A resident of Sound Beach, Karl

Another of Swyler's initiatives was

dren and adults.

and students on site.

Swyler's enthusiasm for improving

Swyler also served as a volunteer

search positions.

## First Apheresis Blood Drive at BNL



Diana Teich of the Procurement and Property Management Division has her arm prepped for the apheresis blood donation.

NL's first apheresis blood drive was "a great success, B thanks to the 30 BNL employees who volunteered their time, as well as their blood platelets for this worthy cause," said Susan Foster, Human Resources Division, who organized the drive. BNL is the second company on Long Island to sponsor an apheresis blood drive, which was held at the Brookhaven Center on Wednesday and Thursday, August 9 and 10.

Apheresis is a unique type of blood donation. Instead of whole blood, donors give only a certain blood component, usually platelets or plasma. The blood is taken from one arm and channeled through a sterile, disposable kit housed in a  $special \, machine. \, The \, needed \, component \, - \, platelets \, or \, plasma$ is taken out, and the rest of the blood is returned to the donor, usually through the other arm.

Platelets are essential to normal blood clotting, and are used to treat cancer, leukemia, and other diseases. Plasma is used to treat clotting disorders, burn victims, and shock.

Apheresis donor plasma provides a more concentrated product in a larger volume than is possible from one wholeblood donation.

#### Whole blood also needed

Whole blood is also greatly needed, however. BNL's next whole-blood drive is scheduled for September 14. For information on BNL's blood drives contact Foster, Ext. 2888 or – John Galvin foster2@bnl.gov.

### **Pollution Prevention Projects**

radiologically contaminated and/or activated lead bricks into two of its walls. This design change reduced the potential environmental liability and the cost of managing inventories resulting from on-site lead stockpiles. BNL thereby saved over \$300,000 in disposal-related costs.

The Low-Flow, Low-Purge Well Sampling project team earned DOE

impacts of current operations, and develop an Environmental Management System to plan for, minimize, and control environmental impacts in the future. Goode emphasized that implementing these projects has provided BNL with an unprecedented degree of knowledge about site operations and their impact on the environment.

### In Memoriam Karl Swyler, Educational Programs' Manager

Karl Swyler, Manager of BNL's Office of Educational Programs (OEP) in the Community Involvement, Government & Public Affairs Division, died on Wednesday, August 2. He was 59.

Students, teachers, BNL colleagues, staff from colleges, institutions, other national labs, and DOE have sent many messages of sympathy and tributes to Swyler, some of which follow:

"He was a grand gentleman and scientist who really cared about science and education.

"I am grateful for Karl's encouragement through the tough times and his passion for education and dedication to the students and teachers . . . a real gentleman . . . our friend as well as colleague; we will miss you.'

"I will always think of his love of science and dedication to sharing his knowledge with teachers and children." "His honesty, integrity, sense of hu-

mor and his bigness will be sorely missed.

"A very good man and a dedicated educator.

"We'll miss his unwavering commitment to high-quality education . . . and his friendship."

"I really admired him and his dedication towards students like myself."

"I respected his devotion to the students."

Swyler joined BNL Physics Department in 1974, a year after earning his Ph.D. from the University of Rochester's Institute of Optics. As an assistant physicist, he performed basic studies in radiation damage.

In 1976, he transferred to the then Department of Applied Science, being promoted to associate physicist in 1977. In 1980, he was named Physicist, moving to the then Department of Nuclear Energy, and in 1982, he received a continuing appointment.

As a physicist, Swyler often acted as a mentor for students from both the



- Liz Seubert

Friends of Karl Swyler remember his performances as a member of the BNL Theater Group, which included talented

### (cont'd)

recognition for implementing new technology for sampling monitoring wells. The process significantly reduces the waste "Through teamwork, these

generated by purging wells, with no projects have resulted in reduction in test result quality. The improved environmental new method reperformance for the Lab." duced contaminated purge water

volume by over 135,000 gallons in 1999, saving more than \$150,000 a year in waste management costs, and more than \$100,000 in labor costs.

The Preventing Pollution: Past, Present, and Future recognized three recent BNL environmental projects. Cited were the Facility Review Project, the Process Evaluation Project, and the Environmental Management System Improvement Project. These three projects address vulnerabilities from past practices, assess the environmental aspects and

The Relativistic Heavy Ion Collider's (RHIC) Environmental Management System (EMS) Imple-

mentation was also credited by the DOE for its commitment to significant cost savings and pollution prevention. The RHIC EMS provides a systematic frame-

work for ensuring that BNL manages its RHIC programs in a manner that protects public health and the ecosystem. RHIC was the first DOE Office of Science program and the first Long Island-based organization in New York to achieve the ISO 14001 standard (Brookhaven Bulletin, October 15, 1999).

As Goode concluded, "Through teamwork, these projects have resulted in significant cost savings and improved environmental performance for the Laboratory." — John Galvin



Mort Rosen 8-474-84

banjo playing, often in accompaniment to a funny, satirical song he had written.

### **Cleaning Cadmium From Soil**

place of the original toxic metal. "Cadmium sulfide is fairly stable and will not move into the groundwater as long as the conditions remain anaerobic,' or without oxygen, Vairavamurthy says.

This in situ technique would potentially be less costly than digging up contaminated soil for treatment elsewhere, and even less costly than the water-pumping method described above. Also, because these bacteria can grow in oxygen-rich as well as (cont'd)

oxygen-poor environments, they can be grown in large quantity under normal aerobic conditions in the laboratory, and still survive the oxygenpoor environment below the soil surface.

The same technique might also work for treating soil contaminated with some other metals, such as arsenic and cobalt, Vairavamurthy says.

This research was funded by DOE's Natural and Accelerated Bioremediation Program. — Karen McNulty

7th Walk for Beauty, 9/24

ter at Stony Brook.

call Ext. 2720.

**BERA Events** 

Fight Breast Cancer

On Sunday, September 24, the entire Lab community - employees, facility users, families, guests, retirees - is invited to join the BNL team that will participate in the 7<sup>th</sup> Annual Walk for Beauty. The proceeds from this charitable walk will benefit breast cancer research at the University Hospital and Medical Cen-

Last year, more than 60 members of the BNL community walked. Members of BNL's Women's Program Advisory Com-

mittee are coordinating this year's

Lab effort, and they hope to spon-

sor a record number of partici-

pants from BNL. Join in! For in-

formation and registration forms,

For All the Lab Community

These upcoming BERA Events are

open to all employees, retirees, facility

users, BNL visitors, and their imme-

diate families. Tickets for these events

can be purchased from the BERA Sales

Office in Berkner Hall, Monday

through Friday, from 9 a.m. to 3 p.m.

Tickets are sold on a first-come basis.

All departures are from the Brook-

haven Center promptly at the times

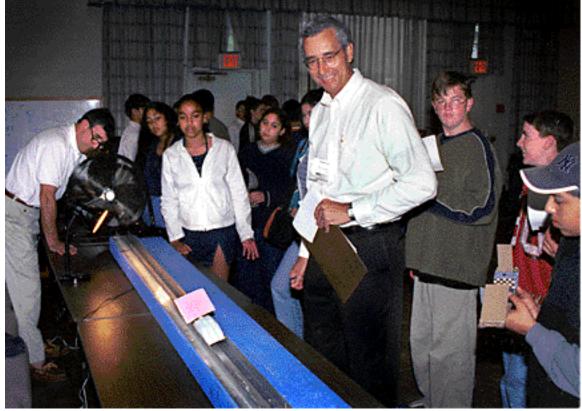
listed below. For additional informa-

tion contact Andrea Dehler. Ext. 3347.

\$24

\$19

## **Annual Middle School Maglev Contest Held at BNL**



**Bill Gunther** (center), one of the **BNL** volunteer Maglev contest judges, and participating students watch prototype vehicles competing at the annual Maglev contest.

Roger Stoutenburgh CN5-247-00

■his past May at BNL, 250 middle school technology **L** students representing 16 school districts from Nassau and Suffolk Counties, raced their custom-made Magnetic Levitation (Maglev) vehicles against the clock.

This year's contest, organized and run by BNL's Office of Educational Programs, was sponsored by BNL, Hofstra University Center for Technology Education, the Long Island Technology Association, the Nassau Technology Association, and the Suffolk Technology Education Association.

The aim of this contest is to integrate math, science, and technology into a project that encourages students to design and build a vehicle based on Maglev technology.

The Maglev concept is the suspension, guidance, and propulsion of vehicles by magnetic forces. It was the 1968 brain child of BNL scientists Gordon Danby and James Powell, who patented the world's first practical, electrodynamic, magnetically levitated train and have won several honors for their idea, including the 2000 Benjamin Franklin Medal in Engineering. Levitated trains operate in Europe and Japan in excess of 300 miles per hour.

To enter the competition, students design and construct their model Maglev vehicles according to engineering speci-

### fications, with a goal of designing the fastest vehicle with the fewest magnets.

Students present judges with "design briefs," which include ideas as well as the successes and failures of their vehicle's design. Judges evaluate the Maglev vehicle's performance on the day of the contest as well as the design briefs presented by each student engineer. Entries are judged for speed, efficiency, and appearance.

First, second, and third place trophy winners were selected in six categories: wind power, gravity driven, self propelled, electrified track, futuristic appearance, and scale appearance.

BNL volunteer judges who evaluated the design concepts and the vehicle's performance on the day of the contest were: Melvyn Cowgill, Bill Gunther, Terri Kneitel, Bruce Lein, Arnold Moodenbaugh, Robert Sabatini, Richard Scheidet, Loralie Smart, and Peter Soo.

Representatives from Hofstra University, employees from the Lab's Fire-Rescue Group and from the Community Involvement, Government, and Public Affairs Office also volunteered their time to make the event a success.

- John Galvin

### **Atlantic City Bus Trip** Saturday, September 9 Resorts/Casino on Boardwalk

or M. Kay Dellimore, Ext. 2873.

Atlantic City, NJ Receive coin bonus return Depart from BNL at 8 a.m. Leave for BNL at 10:30 p.m.

Wine Tour & Tasting \$23

### Saturday, September 23 Bus trip to Paumanok, Jamesport, Pugliese, and Pindar Vineyards. Free time in Greenport for shopping or dinner from 4:30 to 7 p.m. Depart from BNL at 11 a.m. Return to BNL at 8 p.m.

New York City Saturday, October 14

Do your own thing or visit the Hayden Planetarium or the American Museum of Natural History. Two stops will be made: north side of the Museum, West 81st St.; and Rockefeller Center area for shopping and dining. Depart from BNL at 11 a.m. Leave for BNL at 7 p.m.

### **Radio City Christmas Show** \$89 Saturday, December 9 2 p.m. matinee at Radio City Music

## **Defensive Driving**

The training group of the Safety & Health Services Division will offer a six-hour defensive driving course on Saturday, September 23, 9 a.m.-3:30 p.m., in Berkner Hall, Room B.

The course is open to BNL, BSA, and DOE employees, BNL facility-users, and their families, at \$23 per person. Completing the course entitles participants to a 10-percent discount on liability and collision insurance for three years. In addition, MetLife now offers a 5 percent discount on auto and home insurance to all the BNL community. For more information on the discount, call 952-3436.

To register for the driving course, send a check made out to Empire Safety Council, in care of Scott Zambelli, P.O. Box 670, Mount Sinai, NY 11766. All checks must be received by Monday, September 18. Include your phone number on the check in case you need to be contacted.

### Arrivals -none-**Departures** Galen Hon ..... Env. Sci.

Douglas Hunter ..... Medical

**Arrivals & Departures** 

### No Bulletin, 9/8

In observance of Labor Day, the Lab will be closed on Monday, September 4. So there will be no Bulletin published that Friday, September 8.

## Call for Bowlers

### Vacuum Seminar

Varian Vacuum Technologies will offer a four-hour vacuum course, 8:30 a.m.-12:30 p.m., on two days: Tuesday and Wednesday, August 29 and 30, in Room B, Berkner Hall.

From skilled practitioners to those with minimum experience, those interested in vacuum science will benefit from this seminar in high and ultra-high vacuum. Topics will include HV/UHV introduction, materials selection, gas load, system pumping speed, vacuum gauges, system operation and troubleshooting, and a question and answer session.

Advanced registration is required, so call 516-795-3320 or e-mail jim.primm@varianinc.com. Include your name, affiliation, phone number, and specify which date you will be attending.

## BROOKHANEN BULEIN

Published weekly by the Media & Communications Office for the employees, facility-users and retirees of **BROOKHAVEN NATIONAL LABORATORY** 

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On the World Wide Web, the Brookhaven Bulletin is located at www.pubaf.bnl.gov/bulletin.html. A Weekly Calendar listing scientific and technical seminars and ectures is found at www.pubaf.bnl.gov/calendar.html.

### Mixed League

It's time to "think bowling" again. All the BNL community — employees, facility users, retirees, family, and friends — is welcome to join. You do not have to be a great bowler, just a willing one!

Applications for the Thursday night mixed league that meets in Shirley are available now. All team registrations are due by August 31. For applications and more information, contact Debbie Keating, Ext. 3888.

### Men's Money League

The BERA Men's Money Bowling League is open to BNL workers, facility users, and their families and friends. Beginning on September 5, the league will meet on Tuesday nights, with a 6:30 p.m. start. For more information contact John McCaffrey, Ext. 2075; Ron Mulderig, Ext. 3084; or Ken Kobel, Ext. 7351.

## Equipment Demo, 9/29

### Voicestream/Omnipoint

On Tuesday, August 29, 10 a.m.-2:30 p.m. in Berkner Hall, Voicestream/ Omnipoint Communications will discuss special rates for BNLers on digital PCS wireless services on their GSM network.

Service plans include free caller ID, voice mail, SMS messaging, and more. Service plans include \$19.99 per month for 75 minutes, and \$39.99 per month for 500 minutes with the first incoming minute free, and weekend calling free, with a one year contract. A new family plan for two phones, international calling, and roaming options are available.

For more information contact Richard Goll, 516-343-5900.

Hall. Orchestra/front mezzanine seats. Free time in Rockefeller Center area.

Depart from BNL at 9 a.m. Leave for BNL at 7 p.m.

## Softball Party, 9/29

All Softball League players, their families, and friends are invited to the BERA Softball League Party. The party will be held at the Brookhaven Center on Friday, September 29th, starting at 5:30 p.m. Tickets are \$10 per person which will include a DJ and a buffet dinner with two drink coupons for beer, wine, or soda. There will be a cash bar.

Everyone must have a ticket! To buy tickets, bring cash to Andrea Epple, Bldg. 51M, by Friday, September 15. No tickets will be sold at the door. For more information e-mail softball@bnl.gov.

### Classified Advertise ments

OPEN RECRUITMENT – Opportunities for Laboratory employees and outside candidates

MK8888. QUALITY MANAGEMENT PROGRAMS & SERVICES MANAGER - Requires a bachelor's degree in science or engineering, with a minimum of 15 years' management experience in the development and implementation of Quality Management (QM) programs, including QM methodologies and practices. A strategic and tactical working knowledge of Performance-Based Management and BNL's Standard-Based Management Systems (SBMS) is essential. Individual must be innovative as well as a self-starter, capable of completing tasks with little direction. Excellent interpersonal and communications skills a must, as is a strong customer orientation. Must be able to lead a staff of professionals and motivate other QA Representatives in the practical and integrated management system approach to requirements in DOE Order 414.1 and/or 10 CFR 830.120 "Quality Assurance." Experience with Malcolm Baldrige is a plus, as is active participation, with recognized lead-ership positions, in outside organizations such as the "American Society for Quality," EFCOG, or QAWG. Will assume responsibility for the development and implementation of a new approach to BNL Quality Programs & Services and interface with DOE, as well as other DOE facilities in responding to Quality initia-tives. Will be responsible for establishing a centralized office utilizing BNL's Quality staff by developing a comprehensive knowledge resource capable of providing services, on request, to BNL organizations and SBMS management system stewards. Other duties may include training, facilitating process im-provement teams, developing SBMS subject areas, and assessing implementation of the Quality Integration Project program elements. ESH & Quality Directorate.

NS8867. COMPUTER PROGRAMMER POSITION -(reposting) Requires a bachelor's degree in computer science, or a related field and substantial C or C++ experience. Experience in the following areas is desirable: Real-time OS, interfacing hardware, UNIX programming, control systems. Must be able to work with a minimum of direction and interface with engineers and physicists to determine and implement requirements. Will be responsible for developing real-time software to control hardware and will work with a staff that is providing software and hardware to control a large accelera-tor. SNS Project/Collider-Accelerator Department.

DD8582. CLINICAL RESEARCH CENTER ADMINIS-TRATOR – (reposting) Requires BS in management or a related technical field; MS preferred. Excellent orga-nization skills, the ability to work independently and demonstrated ability to interpret and apply Federal and other applicable regulations to BNL clinical re-search operations also required. Experience with clinical research, hospital administration, pharma-ceuticals, or infectious diseases is desirable. Reporting directly to the Chair of the Medical Department, will provide line management for the operation of the Clinical Research Center. This consists of the direct supervision of the administrative, technical, and medical staff responsible for the day to day operations of the Clinical Research Center. Will be responsible for maintaining the policy and procedure documents, conducting and documenting assessments and re-views, and participating in committee activities and special projects. Medical Department. Motor Vehicles & Supplies

98 FORD RANGER XLT - a/c, p/s, am/fm/cass., 36k mi. or 3 year warr., 19k mi., \$14,200. 363-6940.

95 CAMARO - green/tan, a/t, V-6, c/c, full power, alarm, remote start, Bose CD, ABS, airbags, cust. exhaust & rims, 54k mi., excel. cond., \$9,500 neg. Bill, 924-6940.

95 SAAB 900S - 10 disc CD player, 122k mi., excel. cond., \$8,000 obo. Ext. 5073

94 TOYOTA COROLLA DX - sedan, beige, all power, 5-spd., am/fm/cass., new clutch & brakes, 100k mi., excel. cond., \$6,000. 924-3633.

93 SAAB 900S - 3-dr., 5-spd., c/c, p/w, a/c, leather int., p/sunroof, 11k mi., \$10,500. Laddie, 286-8814. 92 FORD BRONCO - 2-dr., a/t, 4wd, new tires, brakes & shocks, 96k mi., ask. \$9,000. Ed, 667-7900

92 VW PASSAT GL - teal, 5-spd., 4-dr., a/c, sunroof, 49k mi., looks good, runs well. 286-0126.

90 MITSUBISHI ECLIPSE - 4-cyl., a/t, a/c, wide tires, chrome plated rims, good cond., \$2,400. Ext. 2411. 90 PONTIAC GRAND PRIX - V-6, 3.1L., p/s, p/b, p/w, c/ c, a/c, am/fm/cass., trip computer, clean. Scott, 591-4011.

88 CROWN VICTORIA - \$1,500. John, 665-4495. 86 PONTIAC GRAND PRIX - V-8, 350 cu. in., a/c, p/w, p/l, \$1,000. Chris, 472-2803.

85 BUICK REGAL - 6-cyl., 2-dr., a/t, runs well, \$1,600. Gary, 587-8379.

### Last of This Year's Free Summer Sundays is August 27th **RHIC is This Sunday's Featured Facility**



This aerial photograph of the Lab site shows the ring of the Relativistic Heavy Ion Collider (RHIC) in the center background.

n Sunday, August 27, Summer Sunday visitors to BNL can take a tour of the world's newest and biggest particle accelerator for nuclear physics research, the Relativistic Heavy Ion Collider (RHIC). RHIC will replicate conditions thought to have existed immediately following the Big Bang so that scientists can study subatomic particles and their interactions as well as how the universe evolved. RHIC is made up of two superconducting accelerator rings, each 2.4 miles in circumference. Visitors will tour the ring in a bus and see the detectors, which gather data from the heavy ion collisions that take place at ring intersections.

Visitors may also take guided bus tours of the Lab site that will run continuously throughout the day, participate in the Whiz Bang Science Show, and view the Camp Upton Historical Collection.

Fun for children of all ages, the Whiz Bang Science Show is a lively, interactive demonstration of basic scientific principles. It will be presented continuously between 10 a.m. and 3 p.m. in Berkner Hall.

Housed in a Camp Upton chapel, the Camp Upton Historical Collection contains the history of the site during its pre-Lab days as a U.S. Army camp during World Wars I and II.

Organized by BNL's Museum Programs of the Community Relations Office, BNL's Summer Sunday tours run from 10 a.m. to 3 p.m., but visitors must arrive before 3 p.m. The tours are free and open to the public, and no reservations are needed.

sized, good cond., \$45. Carl, Ext. 2543

DESK - wooden, dark brown, exec. style, ask. \$300; Sears dryer, elec., \$50. Dorian, Ext. 2374 or 929-0659.

DINETTE TABLE - w/leaf, \$20; gas stove, almond, v.g. cond., \$75; Graco stroller, \$75; air conditioner, 5,00-

DINING ROOM - Bennington, Colonial, pine table, oval to 66", lighted china cabinet w/detachable hutch,

REFRIGERATOR - GE, almond, side by side, ice & water in door, 5 yrs. old, orig. \$1,300, sell \$900. 821-3762.

SOFA - convertible, queen-size, \$125. 567-7813.

TABLES - 3, contemporary, swivel cocktail, glass-top end, glass-top sofa, tan lacquered finish, brass trim, paid \$770, ask. \$300. Bill, 924-6940.

### Tools, House & Garden

LAWN MOWER - gas grill; air conditioner, apt. size; stove, gas; dryer, new; Christmas tree, artificial, bal-sam fir; table; chairs. Ext. 3962.

RIDING MOWER - Snapper, rear eng., 28", 10 h.p., bagger never used, 3 mulching blades, manual, used 2 yrs., \$1,200. Laddie, 286-8814.

SHUTTERS - 2, white, int., wood, 4-panel, bi-fold, 35" x 52", 4/4 double-hung, "27 x 44", good cond., new \$400/ ea. sell \$50/ea. Ron, Ext. 4449. NINTENDO & PLAY STATION - several games, memory card. Craig, 732-8192.

TONKA CD ROM PLAYSETS - Workshop Construction Zone, \$25/ea., Search Rescue, \$15/ea.; Sega Genesis, 3 games, \$25. Mike, Ext. 3255.

VIDEO CAMERA - full-size, zoom, auto/manual fade, extra batteries & charger, carrying case, cost \$1,000, sell \$100; records, old, variety, \$.50/ea. 543-7065.

#### Miscellaneous

INFANT JOGGING CYCLE - 3-wheel or bike tow behind setup, \$50; Graco car seats or boosters, \$20/ea. Dorian, Ext. 2374 or 929-0659.

POOL COVER - 16' x 40', heavy-guage, poly-woven, new, in sealed box, \$50. 744-4611

TICKETS - 3, L.I. Ducks, 9/5, 7 p.m., Sec. 209, above 3rd base dugout, \$8/ea. Rich, Ext. 2410.

### Yard & Garage Sales

EAST MORICHES - 8/25 - 8/27, 10 a.m. - 4 p.m., 149 Pine Street, tools, books, linens, houseware, patio furniture, much more, moving.

SELDEN - moving sale, contents of home, 8/26 & 8/27, 8 a.m. - 5 p.m., 5 Cleveland Ave, cross street Mooney Pond Road.

47 EASON DRIVE - 8/26 & 8/27, 10 a.m. - 6 p.m., off

## BNL Dance Club **BALLROOM DANCE LESSONS**

8 Wednesdays

starting September 13 09/13-11/01/00

North Ballroom, Brookhaven Center

- for beginners -AMERICAN BALLROOM 101 6-7 p.m. introductory class, 4 dances: lindy starts 09/13, swing starts 09/27

bolero starts 10/11, tango starts 10/25 – \$30 per person/8 weeks –

### - for continuing students -AMERICAN RUMBA & WALTZ LEVEL I & II REVIEW

7-8 p.m. syllabus class, 2 dances: rumba starts 09/13, waltz starts 10/11 – \$30 per person/8 weeks –

 for experienced dancers — AMERICAN SMOOTH/ INTERNATIONAL STANDARD TECHNIQUE & PRINCIPLES 8-9 p.m. master class

dances selected by consensus - \$40 per person/8 weeks -

hese are the best and most affordable ballroomdance group lessons around, so classes are very popular! Enrollement is limited, so register in advance of the first day of class! BNL employees, retirees, facility-users, guests, family, and friends are welcome!

For the compete 2000-01 schedule, see last week's Bulletin. For more information and registration forms, contact:

- Marsha Belford, club president, belford@bnl.gov or Ext. 5053;
- Ron Ondrovic, vice president,
- ondrovic@bnl.gov or Ext. 4553.

BROOKHAVEN HAMLET - 3-bdrm. house, 2 full bath, eik, den, l/r, bright, fenced yard, \$125,000. Ext. 3849. EAST MARION - 1 acre building lot, adj. to Greenbelt, walk to Sound. 325-0447 after 5 p.m.

MIDDLE ISLAND - Diamond, 3 bdrm. ranch, 2 updated bath, cust. eik, all appls., l/r, d/r, hw flrs., bsmt., 2 car gar., new deck, fenced, 75' x 125', 10 min. to Lab, avail. 12/31, \$184,900. Bill, 924-6940.

MIDDLE ISLAND - Fairview, 2-bdrm. upper condo, 11/2 bath, 5 appls., cac, deck, pool, ask. \$94,990. 208-2910.

NORTH SHIRLEY - 5-bdrm. Colonial, sunroom, d/r, 2 l/r, country kit., above ground pool, 5 min. to Lab, 50' x 217'. Ext. 2384.

WADING RIVER - 3 bdrm. ranch, cedar shake, 2 bath, move-in cond., IGS, 24' AGP, full bsmt., 1 car gar., 1 acre, S.W.R.S.D., fenced, brick patio, ask. \$255,000. Dorian, 929-0659.

WADING RIVER - White Cape, 3-bdrm., office, l/r, d/r, eik, den, priv. road, 1.2 acres, wooded lot, by appt. 929-3732

YAPHANK - 4-bdrm. cape, 1 bath, IGP, decking, fin. bsmt., hardwood flrs., new kit., Pella windows, renovated completely, 1/3 acre, ask. \$174,000. Steven, Ext. 4988.

ENGLEWOOD, FL - 2 bdrm., 2 bath, den, 2 car gar.

Btu., \$50. Lee, Ext. 6306

6 spinal chairs, good cond., \$399. 321-1497.

85 HONDA ACCORD - 4-dr., 5-spd., no accidents, well main t., orig. owner, runs well, \$850. Jim, Ext. 3354 or 924-7374.

84 BMW 325E - 5-spd., 6-cyl., 2-dr., sunroof, am/fm/ cass., 153k mi., \$2,350. 473-2473.

COVER - Tonneau, fits Chevy S10 std. bed, 1994-00, 2 mos. old, cost \$230, ask. \$175 obo. Carl, 369-3730.

CORVETTE EXHAUST - Blackjack Alumakote headers, Monza dual bullet tip, complete system, Ecklers, never opened, 1968-73, \$400. Dorian, Ext. 2374 or 929-0659.

POWER ANTENNA - new, in box, orig. \$200, sell \$50. Fred, 369-9720.

RECEIVER HITCH - Reese, class III, for Ford pickup, \$50. 722-4821.

RIMS - GM, chrome-plated, 5 lug tires inc., \$175. Dan, 475-3527.

#### **Boats & Marine Supplies**

21' BOWRIDER - fg, new canvas, 115 h.p. outboard, trailer, well maint., boat slip until Nov. inc., extras, or trade for 2-dr. car. Fred, 369-9720.

20' STILLWAGON GARVEY - clamboat, f.g. cabin, c.c. wash deck, 1995 88 h.p. Johnson, Cox trailer, many new parts, mint cond., ask. \$4,000. 589-6803.

10' POTO-BOAT - folding, eng. mount, \$195; 5 h.p. outboard, external gas tank, mint, \$195. Bill, 822-6941.

#### **Furnishings & Appliances**

BED - Little Tykes, blue, for toddler, car-type, \$60; train set, \$20; constr. trucks, x-large, \$7/ea. Lloyd, 422-5169. DESK - roll-top, orig. \$500, sell \$175; armchair, over-

TRACTOR - Ariens, 16 h.p., 42" mower deck, 48" 2stage snow blower, 52" dozer blade, v.g. cond. 325-0447 after 5 p.m.

#### Sports, Hobbies & Pets

BIKE - BMX, Haro frame, 3-pc. crank & gyro, for dirt or freestyle, all new parts, \$125. Keith, Ext. 3458 or 369-2504

BIKE - boy's, blue, Huffy, new, training wheels, \$50; Little Tykes coupe car, gas tank, \$25. Lloyd, 422-5169.

BIKE - Outpost Trail, lady's, red, 1995, 141/2", barely used, \$100. Maria, Ext. 3033 or 345-5365 after 5 p.m.

BIKE - mountain; hockey helmet; pads; inline skates. Pat, Ext. 3962

MULTI SPORT NET - driving or hitting, indoor or outdoor, used twice, cost \$50, sell \$20. 543-7065.

NORDIC TRACK - top of the line, \$300, Jim, Ext, 5993. NORDIC TRACK PRO - w/monitor, \$350. Nick, Ext. 3205. PIANO - Wurlitzer player, needs TLC, \$1,000 obo. 821-3762.

PUPPIES - Labrador Retreiver, champion lines, bred for temperment, AKC reg., hips OFA cert. 744-5921.

UNIVERSAL WEIGHT MACHINE - gym quality, heavyduty attachments inc. squats, pull down rows, leg & arm press, pull ups, ask. \$500. Dorian, Ext. 2374 or 929-0659.

#### Audio, Video & Computers

CAR STEREO - Alpine, am/fm/cass., CD changer, 25W x 4 output w/RCA's, detach. face, \$100; Sony Disccman, 10 sec. ESP, digital mega bass, \$45. Aron, Ext. 4615.

Longwood Road, furniture, household, much more.

#### Free

HEDGE TRIMMER - Little Wonder, 16", need to be fixed. Laddie, 286-8814.

### For Sale or Rent

BAITING HOLLOW - 1 bdrm. cottage, North Shore beach community, screened porch, slider to rear deck, eik, updated bath, \$500/wk. or \$24,990. Mike, Ext. 7861 or 821-4064.

### For Rent

BROOKHAVEN - 1-bdrm., full bath, l/r, eik, a/c, many closets, priv. ent., no smoking/pets, avail. 9/1, \$750/mo. + sec., inc. all. 286-5368 eves. or pager 516-948-2633.

EAST MORICHES - house to share, 1 bdrm., a/c, furnished, 10 mi. to Lab, 300' to beach, single, non smoker, \$475/mo, 744-8386.

EAST PATCHOGUE - 1-bdrm., South Country area, many closets, f/p, w/w, no smoking/kids/pets, \$675/mo. + sec. Zarina, 286-1879.

NORTH PATCHOGUE - legal 1 bdrm. apt., 1st floor, ranch, suitable for 1 or 2 person, \$600/mo. + sec. + elec. Ext. 7658.

WADING RIVER - 1 bdrm. apt., unfurn., eik, l/r, full bath, priv. ent., 1 block to L.I. Sound, 10 min. to Lab, \$600/mo. + sec., inc. util. 929-3419 after 6 p.m.

HILTON HEAD, SC - condo, sleeps 6, fully furn., 2-bdrm., 2 baths, pool, beach, golf nearby, avail., Apr. to Oct. \$525/wk. Guy, Ext. 3147 or 689-5378.

#### For Sale

sq. it., over bb 914-475-0608.

FORT LAUDERDALE, FL - Vacation Village at Bonaventure, Gold Crown Resort, 3-bdrm., lockout unit, sleeps 8, golf, fitness center, trades for 2 wks., 1 maint. fee, wk. 51, \$10,000. Ken, 281-5565.

VENICE, FL - parcel consisting of 3 lots, 1/3 acre, 1 mi. to Mamasota Beach, taxes \$280/yr., \$16,900. Andy, Ext. 7014 or 281-8274.

### Wanted

DRAWING TABLE - wood, tilting, 23" x 31". John, 765-1299

DONATIONS - to help feed & neuter stray cats. Pat, Ext. 7705.

PEOPLE - interested in forming a BERA concert club, featuring Rishell & Raines W.C. Handy award winners, best acoustic blues jam. Joe, jjv@bnl.gov

PERSON - to wash linens & do light cleaning on-site, 1/wk., for 3 wks. in Sept. Kathy, Ext. 3845.

RENTAL - Nov. - Feb., furn., for visiting scientist & spouse, Bellport pref. Kathleen, Ext. 3845.

#### **Community Involvement**

SPONSORS - wanted for the 3-Day Walk for Breast Cancer, 60mi., tax deduct. Ext. 2632 or mirabella@bnl.gov.

### In Appreciation

Many thanks to my friends who made my retirement party such a success. I will miss you all. Hablelfondimenosies of impl30 years at BNU LLove,