

345th Brookhaven Lecture

Shaking Neutrons Loose at the Alternating Gradient Synchrotron

When your sick child is cranky, you are thankful that the thermometer so reluctantly kept under his or her tongue only takes a minute or so to record temperature. That's because the thin stream of liquid mercury that is contained in most household thermometers expands very quickly with heat.

However, when a large amount of mercury is heated unevenly — as happens when the mercury is used as a target and struck by a pulse of high-energy proton particles — the mercury closest to center of the proton beam wants to expand more than the rest. This causes pressure in the mercury. Since liquid mercury has to be held in a container, it is therefore vital that the pressure does not create stresses that exceed the strength of the containing vessel, or the container could leak.

And that was why the researchers in Experiment 938 at the Alternating Gradient Synchrotron (AGS) were jubilant after their June 1997 and subsequent experiments: They had been testing a model mercury target designed for a new facility, the Spallation Neutron Source (SNS), to be located at Oak Ridge National Laboratory to produce neutrons for research by a process called spallation. This process entails bursts of protons striking a heavy-metal target and producing bursts, or pulses, of neutrons.

The E938 data verified that, when a single pulse of protons that have an energy equivalent to what is expected at the SNS strikes this mercury target, the stress within the target container is less than the yield stress of the container. These and subsequent

E938 results have shown that liquid mercury would be a good candidate target for the SNS.

To discuss the mercury tests and why the AGS is so suited for spallation neutron-source investigations, E938 member Senior Physicist Jerry Hastings of the National Synchrotron Light Source (NSLS) Department, will give the 345th Brookhaven Lecture, "Shaking Neutrons Loose: The Spallation Neutron Source at the AGS." For his talk, which will be on Wednesday, April 21, at 4 p.m. in Berkner Hall, Hastings will be introduced by Denis McWhan, Associate Laboratory Director for Basic Energy Sciences.

The E938 team is a consortium of researchers from Japan, Germany, Switzerland, and the U.S. As Hastings will explain, the AGS proton beam has unique advantages for their experiments: it is the world's most intense, delivering the most protons per pulse and the largest peak energy, therefore making the most neutrons possible in a single pulse. Also, the beam's energy and the time that elapses between proton bursts are ideal for some spallation neutron-source requirements.

Hastings will also explain how the pulses of neutrons from spallation sources are used. These applications can complement studies made using the continuous neutron beams emitted from nuclear research reactors.

Jerry Hastings earned his Ph.D. in applied physics at Cornell University in 1975, while working 1974-76 as a metallurgist at ORNL. Then, he spent a year as a research associate at Stanford Synchrotron Radiation Laboratory. During the period 1973-77, he was also a guest scientist in BNL's

Physics Department.

In 1977, Hastings joined Physics full time as an assistant physicist, moving to the NSLS in 1982. Granted tenure in 1986, he was named Senior Physicist in 1991 and received a Brookhaven Distinguished Research & Development Award in 1998. He is a fellow of the American Physical So-

ciety and a member of the American Crystallographic Association.

Coffee and cookies will be served in the lobby before the lecture, and refreshments will be offered afterwards. Those who wish to join the lecturer for dinner at a restaurant off site may call Pam Ciufu, Ext. 4884, by noon on Wednesday, April 21. — Liz Seubert

Goldhaber Receives Fermi Award Today

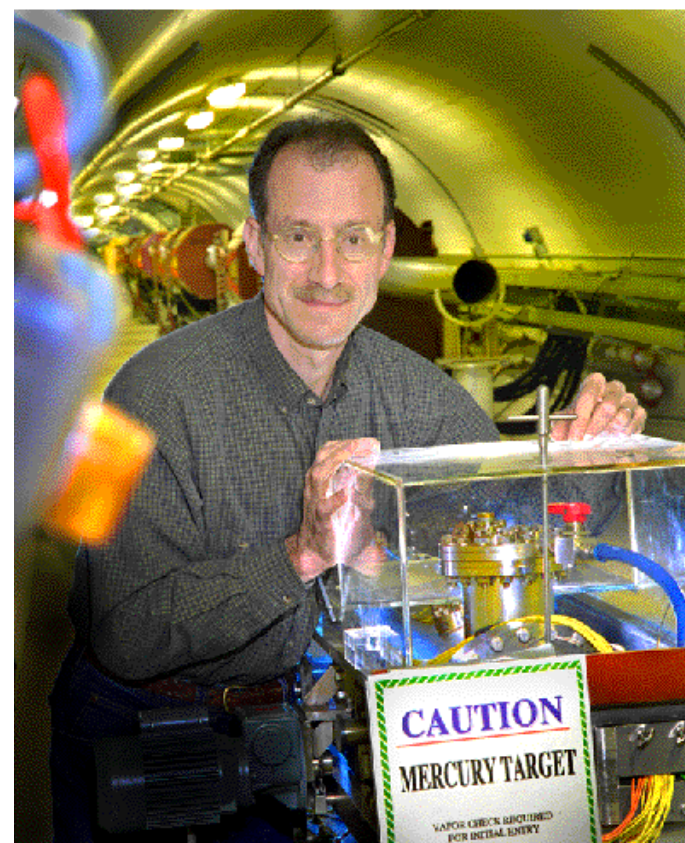


Today, at a Washington, D.C., ceremony, the White House will present BNL Distinguished Scientist emeritus Maurice Goldhaber (center) with the Enrico Fermi Award (see Brookhaven Bulletin, February 26, 1999).

On March 18, BNL's Physics Department held its own ceremony, to congratulate one of its own for bringing home DOE's highest honor.

Hosted by Physics Department Chair Michael Murtagh and attended by nearly every member of Physics and many of Goldhaber's collaborators and friends from around site, the event was an occasion to bring together three Brookhaven Laboratory Directors: (from left) the current and sixth Lab Director, John Marburger, who spoke for BNL in congratulating Goldhaber, saying, "You are the standard model — you capture the spirit of the Laboratory;" Goldhaber, who had served as the Lab's third Director, 1961-73; and the Lab's fifth Director, Nicholas Samios, who called Goldhaber a "national treasure" in reflecting upon Goldhaber's accomplishments in physics, his encouragement of upcoming scientists, and his continuing to have "the enthusiasm of a postdoc."

In thanking all, Goldhaber pointed out: "Awards can only single out the tip of the iceberg — but, admittedly, it feels cool to stand on the tip of the iceberg." — Marsha Belford



Jerry Hastings

Coming Up

Celebration Lectures 4/29 & 30

BNL and the State University of New York at Stony Brook (USB) will celebrate the 50th anniversary of the publication of the renowned paper on the theory of the kinetic isotope effect, which was written by BNL's Jacob Bigeleisen, now USB Distinguished Professor emeritus.

For the occasion, two lectures will be given: Max Wolfsberg, formerly of BNL's Chemistry Department and now University of California (UC), Irvine, will talk on "Fifty Years of the Kinetic Isotope Effect," at 4 p.m. on Thursday, April 29, in BNL's Hamilton Seminar Room,

Bldg. 555; and Judith Klinman, UC Berkeley, will lecture on "Kinetic Isotope Effects in Enzymatic Reactions," in the USB Chemistry Department on Friday, April 30, at 4 p.m.

A dinner will be held in Berkner Hall at 6 p.m. on Thursday, April 29. All are welcome; call Jean Petterson, Ext. 4302, for information or to reserve a place.

BSA Distinguished Lecture 4/30

On Friday, April 30, Kip Thorne, who is the Feynman Professor of Theoretical Physics at the California Institute of Technology, will give the next BSA Distinguished Lecture, "Space-Time Warps and the Quantum: A Glimpse of the Future," at 4 p.m. in Berkner Hall. The talk will be followed by a reception in the lobby. All are invited.

New Vehicle-Inspection Loop at Main Gate to Open April 28

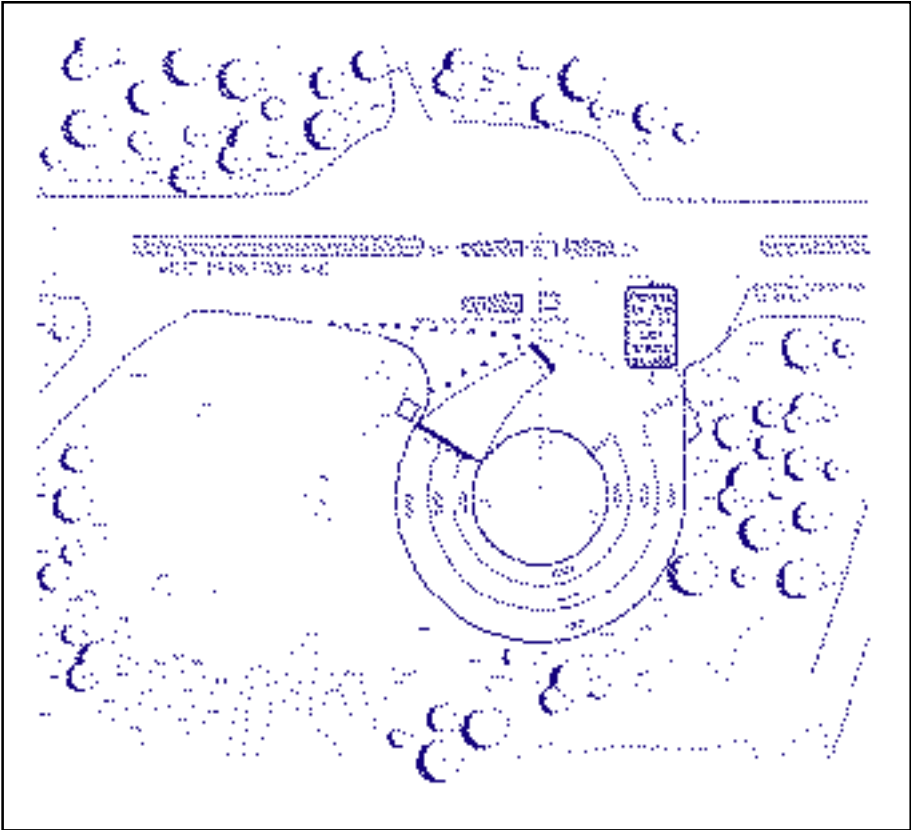
The excavation, grading and paving by the main gate, which began at the end of September (see Brookhaven Bulletin, September 25, 1998), has been completed, and what has emerged out of that construction is a vehicle-inspection loop (see drawing, right).

The loop will allow the Safeguard & Security Division patrol officers at the main gate to inspect trucks and other incoming vehicles, and to control the access of contractors and visitors to the site without tying up authorized traffic and endangering their own safety.

What prompted the construction of the loop were several incidents at the main gate in which patrol officers and those whom they had stopped were nearly hit by rush-hour traffic.

“Upon reviewing these near-accidents, it was concluded that there was simply not enough room to allow patrol officers to inspect vehicles and attend to visitor access safely, while the majority of BNL employees are trying to get to work on time,” says Martin Fallier, Project Coordination Manager of the Plant Engineering (PE) Division, who worked on this project with PE’s John Castro, Scott Guthrie, and Abass Wessen.

Thus, on April 28, the vehicle-inspection loop will open for business. As a result, those heading into the Lab via the main gate will be faced with two entrance lanes (see drawing, be-



low, right) and some new procedures:

- **morning rush hour:** between 7:45 and 8:45 a.m., BNL, BSA, DOE and National Weather Service employees, and BNL guests with room keys who have either a Lab vehicle-identification sticker (see box below) or

the appropriate ID badge are to stay in the left lane.

Contractors, visitors and trucks are to use the right lane, as are employees without vehicle stickers or ID badges. Contractors will be asked to present their ID badges for

bar-code reading. Visitors to the site must be sponsored (see box, below). And trucks and other vehicles may be inspected, as per S&SD procedures.

Employees going to the Child Development Center may use the right lane, but they should be prepared to be delayed slightly while contractors and vehicles are being screened.

- **off-peak daytime hours:** only the right lane will be open so as to make it easy for vehicles to enter and exit the loop.
- **evening hours:** only the left lane will be open since patrol officers must monitor both entering and exiting traffic.

Drivers directed into the loop will be asked to use either the outer truck lane or the inner car lane, depending upon their vehicle, and will be required to stop at the stop line in front of the guard booth within the loop. The center lane will be used by patrol officers. When the inspection is completed, the driver may proceed to the yield line before merging with traffic already in the right entrance lane.

In approaching the main gate on and after April 28, the best advice is “Go slowly,” says Fallier. “By obeying the 30-mile-per-hour speed limit, you will give not only yourself, but also those who are unfamiliar with the main gate the time to read the new signs and get into the proper lane.”

— Marsha Belford

Site Access Reminders

Vehicle Access

BNL’s Safeguards & Security Division (S&SD) reminds all employees to register their vehicles, if they have not already done so, and to display their BNL’s vehicle-registration sticker on employee-owned-and-operated vehicles while they are on the site.

In addition, S&SD asks all employees to have their BNL identification badges with them while on site.

To reduce traffic delays at entrance gates in the morning, all Lab employees should affix their BNL vehicle-registration stickers to the windshield side of their vehicles’ rearview mirrors. On days when employees must drive a vehicle other than their own to get to work, they are asked to be ready to present their Lab ID badge at the gate to gain access to the site.

Register vehicles at S&SD’s Personnel Security Office in the Brookhaven Center, Building 30.

Visitor, Vendor Access

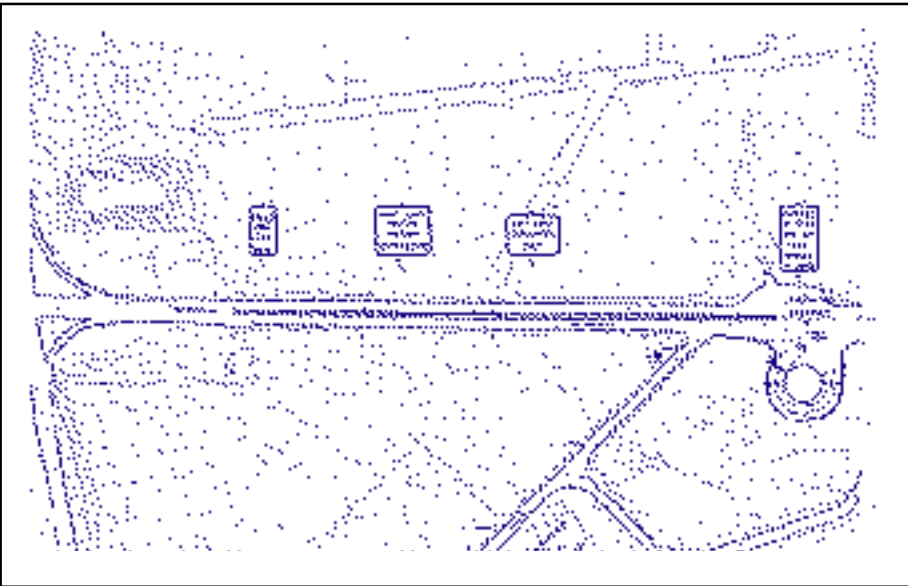
Access to BNL is controlled by permitting entrance only to those persons who have official business at the Lab and only to those visitors who are properly sponsored.

Thus, to avoid having vendors and visitors delayed at the Main Gate while the purpose of their visits is being verified, S&SD asks that employees who sponsor vendors and visitors inform the division at least 24 hours before their guests’ arrival. The 24-hour lead time is needed to compile a visitor log used at the Main Gate and indexed by date, arrival time, event, and sponsor’s name.

Thus, during normal business hours 24 hours in advance of a visit, sponsoring employees should provide S&SD with the following information: the name of the visitor, the date of the visit, the approximate arrival time, the name of the event being attended or reason for visit, and the name of the visitor’s sponsor and that person’s extension.

During the usual weekday business hours, send this information to S&SD, Bldg. 50; fax it to Ext. 5688; or phone it to Ext. 4271 or 4177. To notify S&SD during other hours, come to Police Headquarters in Bldg. 50, fax Ext. 5457, or phone Ext. 2238 or 2239. Due to the volume of visitors, do not call the Main Gate with this information.

When a visitor arrives, S&SD patrol officers at the Main Gate may announce the visitor’s arrival and verify the information provided by calling the sponsoring employee.



Go Green to Stop Smoking, Lose Weight

Combine the power of hypnosis with standard behavior-modification techniques — and you may quit smoking or start dieting after just one session of the Green Seminar.

On Monday, April 26, from 4:30 to 6:30 p.m. in the South Dining Room of the Brookhaven Center, the Green Seminar will be offered to all employees and their dependents who wish to kick the smoking habit or to lose weight. It will be presented by Stuart Green, the president of GSI, a New York company specializing in corporate wellness programs.

The one-session program costs \$10 per person for new attendees, which is payable after the first hour of the two-hour session. Those who have participated in a Green Seminar at the Lab before may attend for free. Participants will receive an audiotape and written material for use at home, to reinforce what was presented at the seminar.

To reserve a place, complete the bottom portion of the Green Seminar flyer sent to all employees and return it to Health Promotion Specialist Mary Wood, Bldg. 490. For more information, call Wood, Ext. 5923.

Hospitality Committee Family Night 4/23

On-site residents are invited to bring their families and friends plus a dish to share to the April potluck family night on Friday, April 23, from 6:30 p.m. to 8:30 p.m. in the Recreation Building in the apartment area.

After sharing supper, spend an evening talking and playing games with your neighbors and friends.

Remaining 1998-99 Brookhaven Lectures

date	speaker, department	subject
May 27	John Flanagan, Biology	Macromolecular Machines
June 16*	Yimei Zhu, DAS	Electron Microscopy in Materials Science
July 21	Tim Hallman, Physics	STAR Dectector at RHIC

* non-standard day

Equipment Demo

On Monday, April 19, from 11 a.m. to 3 p.m., in Berkner Hall, CTP Wireless will discuss the AT&T wireless services corporate cellular rate it offers BNLers.

The service includes airtime rates of 20 cents per minute, 40 minutes of airtime and other free features for a monthly \$19.99 charge. Four free digital phones will be displayed.

For more information on CTP Wireless, call Michael Weisinger or Dennis Lamm, 585-2900.

Attn. H.S. Jrs., Seniors

Advanced math and science students from local high schools who have completed their junior or senior years are invited to apply for the Lab’s Community Summer Science Program. This six-week program, which will run from June 28 through August 6, includes morning science lectures by BNL staff and afternoon internships. The application deadline is May 7. For applications and more information, contact Louise Hanson, Ext. 5849 or hanson2@bnl.gov.

Benefit Notes

For more information on the following, contact Muriel Pfeiffer between 8:30 a.m. and 1 p.m., Monday through Thursday, in the Benefits Office, Human Resources (HR) Division, Bldg. 185, Ext. 2877.

CIGNA PPO Certificate of Insurance

Next week, HR will mail CIGNA PPO insurance certificate to employees who are enrolled in the program. Those who are enrolled but do not receive one should contact the Benefits Office.

Investment Companies’ Web Sites

After establishing personal identification numbers with the investment companies, BNL retirement-plan participants may access information on their accounts through the following Web sites:

invest. co.	Web address
Fidelity	www.fidelity.com
TIAA-CREF	www.tiaa-cref.org
Vanguard	ww.vanguard.com

Trio Recital 4/21

The next BSA Lunchtime Recital will be presented on Wednesday, April 21, 12-12:45 p.m., in Berkner Hall, by a violin, cello and piano trio, playing music by Chausson and Piazzolla.

Violinist Cheryl Norman has performed at Carnegie and Alice Tully Halls, and was a winner of last year’s concerto competition at the State University of New York at Stony Brook.

Cellist Katie Schlaikjer has taken master classes with, among others, Yo Yo Ma, and played at the Aspen Festival.

Pianist Vanessa Fadial holds a master’s from the Cleveland Institute of Music and has performed at the Santa Barbara and Banff festivals.

BSA Lunchtime Recitals are free, informal and open to all. Audience members may bring a box lunch into the hall to enjoy with the music, and may come and go as they please.

Gospel Choir Sings Tonight, Saturday

Tonight, at 7 p.m., the BNL Gospel Choir, a BERA group, will sing at the Unity Baptist Church, Factory Avenue, Mattituck. Then, tomorrow, at 7:30 p.m., the choir will perform at the New Jerusalem Baptist Church, 39 McArthur Avenue, Brentwood.

All are welcome to both of these free programs. For more information on the choir and its programs, call Frances Ligon, Ext. 3709, or Sydell Lamb, Ext. 3389.

BROOKHAVEN BULLETIN

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‘Take Our Daughters to Work’ Day 4/22

On Thursday, April 22, BNLe rs are again invited to bring their daughters age 9 to 15 to the Lab to participate in the on-site activities planned for Take Our Daughters to Work Day.

Created by the Ms. Foundation for Women in 1993, Take Our Daughters to Work Day is held on the fourth Thursday in April, and it is a day dedicated to helping girls focus on their future as the next generation of women in the working world. The theme for this year’s day is “The Future Is Me.”

To discover what their parents do for a living and if their future livelihood will involve science, the daughters of Lab employees will spend the day as follows:

time	activity
8-8:30 a.m.	arrive with parents
8:30 a.m. - 1 p.m.	girls’ morning in parents’ or hosts’ workplace*
1:30 p.m.	welcome by Lab Director John Marburger, Whiz Bang Science Show in Berkner Hall
2:30 p.m.	tour of Lab site
4:45 p.m.	parents to pick up their girls at Berkner Hall.

* Parents who work in potentially hazardous areas may not have their daughters visit their place of work. Instead, arrangements must be made for other employees to play host to those girls in their workplaces for that morning.

To register girls for the day, complete and return the coupon at the bottom of a flyer to all employees to Susan Foster, Human Resources Division, Bldg. 185. Participation is limited to 200 girls, so register your daughter early. A waiting list will be established; if a registered girl is unable to attend, then notify Foster, Ext. 2888, so another girl may go in her place. Parents who work in potentially hazardous areas who are unable to arrange for hosts for their daughters should indicate on the coupon that a host is needed.

For more information, contact Foster, Ext. 2888.

BWIS Seminar

Beetles, Bugs, Bark From Alaska: Synchrotron Radiation Forestry Studies

Brookhaven Women in Science (BWIS) will sponsor a seminar on “Synchrotron Radiation Studies in Forestry,” to be presented by Barbara Illman, a plant pathologist with the U.S. Department of Agriculture, on Wednesday, April 21, from noon to 1 p.m., in the Biology Conference Room, Bldg. 463.

Chair-elect of the Users Executive Committee of National Synchrotron Light Source (NSLS), Illman does research at the NSLS in x-ray spectroscopy and three-dimensional tomographic imaging of wood, beetles and bacteria found in over one million acres of Alaskan forest. All are invited; bring your lunch. BWIS will provide soft drinks and coffee. For more information, call Michael Hart, NSLS Chair, Ext. 5939.

Aviation Club

If you have a pilot’s license or are interested in flying, then the BNL Aviation Club invites you to a membership meeting on Wednesday, April 28, in Room D, Berkner Hall, from noon to 1 p.m. For more information, contact Vincent Castillo, Ext. 3772, or castillo@bnl.gov.

Basketball

Scores from playoff games on April 8			
Wizards 97		Knicks 64	
Terry Buck	25	Shane Stadler	24
Santos Ortiz	20	Lee Walcott	23
Rob Singleton	16	Todd Clatterbuck	8
Charlie Edwards	13	Steve Springston	6
Fred Maier	8	Chris Fockenber g	2
Reggie Sanchez	8	Jim Garrison	1
Jim Rank	7		
Three-point shots: Ortiz (4), Walcott (3), Maier (2), Rank, Sanchez.			
Bombers 85		Bulldogs 58	
Doug Aichroth	19	Louis Lalor	15
Steve Jao	14	Troy Mayo	15
Mitch Williams	14	Pete Ratzke	15
Tracy Fountaine	12	Mike Mallardi	9
Jerry Gaeta	9	Greg Mack	4
Donald Davis	7		
Brian Hobson	4		
Pat Moylan	4		
Ron Mayo	2		
Three-point shots: Mayo (4), Williams (3), Fountaine (2), Gaeta, Lalor, Mallardi, Ratzke.			

Volleyball

League standings as of April 8			
Open League A		Mixed League 2	
Spikers	45-18	Safe Sets	53-10
Death Volley	42-21	Spiked Jello	47-16
Far Side	24-39	Monday Nite Live	42-18
Shank,Cary&Throw	15-48	How-Bout-Dis	35-28
		In-Sideout	35-28
Open League B		Nuts & Bolts	
Late Entry	52-11	Setups	14-46
Bumpin Ugliers	36-27	Just 4-Fun	8-55
Star	34-29	Mixed League 3	
Rice Ball	4-59	Upton Ups	45-12
Mixed League 1		Six Samurai	43-17
Bikers&Spikers	58-5	Group Sets	42-18
Set to Kill	35-28	Net Setters	17-43
Scared Hitless	23-40	NWO	16-44
Rude Dogs	10-53	Butlers	14-43

Life’s a Beach

On Saturday, April 24, BNL volunteers are needed from 9 a.m. to noon to help clean up the beach at Smith Point Park, as part of an extended Earth Day celebration.

No experience is necessary, so bring your family and friends (and sunscreen) for a morning of fresh air, exercise and community spirit. To volunteer, call Elaine Lowenstein, Community Relations Office, Ext. 2400.

Swim Team Results

Two members of the BNL Swim Team brought home one gold, five silver and three bronze medals for age-group finishes at the New York State Masters Short Course Championships at Hofstra University last Saturday and Sunday, April 10 & 11.

100-yard Freestyle		
Kathy Turner	1:14.69	2nd women 35-39
200-yard Freestyle		
Kathy Turner	2:45.31	2nd women 35-39
50-yard Butterfly		
Kathy Turner	36.17	4th women 35-39
100-yard Butterfly		
Kathy Turner	1:27.74	2nd women 35-39
50-yard Backstroke		
Wlodek Guryn	36.83	2nd men 45-49
50-yard Breaststroke		
Wlodek Guryn	35.91	3rd men 45-49
Kathy Turner	43.76	3rd women 35-39
100-yard Breaststroke		
Wlodek Guryn	1:16.98	2nd men 45-49
200-yard Breaststroke		
Wlodek Guryn	2:59.93	3rd men 45-49
100-yard Individual Medley		
Wlodek Guryn	1:13.68	4th men 45-49
Kathy Turner	1:26.23	1st women 35-39

Lifeguard Training

BERA will offer a lifeguard training course at the BNL swimming pool, Bldg. 478, beginning this Sunday, April 18. The course is open to BERA members who are at least 16 years old and who must pass a swimming pre-test that will be given during the first class. The class size will be limited.

Registration at the BNL pool. For fee, time and other information, call Head Lifeguard Susan Dwyer, Ext. 3147 or 3496, after 4 p.m.

Pool Schedule

The new, three-month schedule at the swimming pool began on Thursday, April 1, and will end on Wednesday, June 30. Purchase tickets at the pool during open hours:

Open Hours	
• Monday through Friday	
11 a.m. - 1:30 p.m.	employees only
1:30 - 2 p.m.	speed swimming/training
5 - 8:30 p.m.	employees, families, guests*
• Saturday	
1 - 5 p.m.	employees, families, guests*
The pool is closed on Sundays and all Lab holidays.	

Fee Schedule	
• Daily Admissions	
employee/family member	\$2.00
guest	\$3.00
• Season Tickets (fees not prorated)	
individual	\$42.00
family	\$53.00

***Guest ruling:** One guest per employee is permitted without prior arrangement, but the employee must be present. Advance arrangements for additional guests, up to five per employee at one time, must be made at the Recreation Office, Human Resources Division, Bldg. 185. An admission card will then be issued stating the employee’s life number, the number of guests permitted, the data of the visit, and the facility to be visited. Guests must be accompanied by the sponsoring employee, who will be requested to show the admission card at the main gate and at the swimming pool desk.

Arrivals & Departures

Arrivals	
Lauren E. Brechtel Env. Restoration	
Departures	
John B. Bloom	Reactor
Michael D. Libeson	Biology

Next Friday in Berkner

Robot on Display at Noon

Next Friday, April 23, from noon to 1 p.m. in Berkner Hall, William Floyd High School students and physics teacher Chris Ryon will be joined by BNL retiree Donald Gardner to display the robot they built for the FIRST — For Inspiration & Recognition of Science & Technology — Robotics Competition, a national engineering contest for high-school students.

BREA Meeting at 1 p.m.

Then at 1 p.m. that day, also in Berkner Hall, the BNL Retired Employees Association (BREA) will hear about the current status of Social Security from Jerry Dano, who is the State Coordinator for AARP-VOTE, the voter-education arm of the American Association of Retired Persons (AARP).

VIP Correction

In reporting on the “BNL VIPs [Very Important Persons] Honored for Lab Service” (see Brookhaven Bulletin, April 2, 1999), the Bulletin inadvertently had been misinformed that Irving Feigenbaum, Physics Department, and Seymour Rankowitz, Instrumentation Division, had been BNLeers for 48 years. In fact, each of these VIPs had completed 49 years of service to the Lab in 1998.

Cycletrons Ride Again!

Motorcyclists are invited to join the BNL Cycletrons, the BERA motorcycle club, for their annual spring after-work ride, on Thursday, April 22, leaving at 5 p.m. from the Brookhaven Center. For more information, call Frank Dusek, Ext. 2022.



Placement Notices

The Lab's placement policy is to select the best-qualified candidate for an available position. Candidates are considered 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, disability or veteran status. Each week, the Human Resources Division lists new placement notices, first, so employees may request consideration for themselves, and, second, for 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; call the JOBLINE, Ext. 7744 (344-7744), for a complete list of all job openings; use a TDD system to access job information by calling (516) 344-6018; or access current job openings on the World Wide Web at <http://www.bnl.gov/JOBS/jobs.html>.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

MK7554. POSTDOCTORAL RESEARCH ASSOCIATE - To carry out research on radiolabeling of proteins, peptides and related bioengineered molecules via preparation of radiometal chelates and bioconjugation techniques. Requires a Ph.D. in radiochemistry or organic chemistry, with experience in radiolabeling methodology. Experience in synthetic coordination chemistry and protein-peptide labeling with radiometals is highly desirable, as is experience with radioisotope production/processing and familiarity with radiometal chelates and bioconjugation techniques. Will participate in developing bioengineered vehicles for delivering therapeutic isotopes/toxic genes for the combined radioisotopic/gene therapy of cancer, and the preparation and evaluation of radiometal chelates for bone-cancer therapy. Under the direction of S. Srivastava, Medical Department.

MK7665. POSTDOCTORAL RESEARCH ASSOCIATES - (2 positions) Requires a Ph.D. in nuclear or high-energy physics. Will work for the Nuclear Theory Group on programs in the theory of heavy-ion collisions at ultrarelativistic energies and the structure of nuclear physics. Under the direction of R. Pisarski, Physics Department.

MK7878. MANAGER, INFORMATION INTEGRATION & DEVELOPMENT - (reposting) Requires a bachelor's degree in a scientific, technical or project-management discipline or equivalent, and significant experience in project management, business systems or systems engineering in large organizations. Reporting to the SBMS Office Manager, will be responsible for ensuring integration of information within the SBMS

documentation hierarchy and for supervising a staff of writers. In addition, will ensure that the quality of management systems and Lab-wide procedures and guidelines meet the Lab's needs and expectations; coordinate Lab-wide procedure- and guidance-development activities; and conduct self-assessments of information integration and development performance. Standards Based Management Systems Office.

NS8044. ENGINEERING POSITION - Requires a bachelor's degree in engineering or the equivalent, several years of related work experience in the nuclear and waste-management industry, excellent communication and PC skills, and prior supervisory experience. Primary responsibilities will involve developing and maintaining routine and project schedules, establishing and maintaining commitment tracking for WMD operations, acting as liaison with facility support and generator services, providing technical expertise in the management of radioactive liquid wastes, and assisting WMD in obtaining ISO14000 certification. Waste Management Division.

NS8185. ENGINEERING POSITION - Requires a bachelor's degree in environmental science or engineering (an advanced degree preferred) and/or several years of experience working within an environmental regulatory setting. Good analytical, communication, interpersonal, writing, and basic computer skills are also necessary. In addition, knowledge of the National Environmental Policy Act requirements, cultural resources regulations, and TSCA regulations is required. Knowledge of Malcolm Baldrige processes is desirable. Responsibilities will include: implementing and maintaining the Lab's NEPA and cultural resources programs; assisting the Division Manager in developing, implementing, tracking, identifying trends, and reporting on the Division self-assessment program; providing environmental support to emergency spill responders; and assisting colleagues within ESD in program development and implementation. Environmental Services Division.

NS7668. ELECTRICAL ENGINEERING POSITIONS - Requires a bachelor's degree in electrical engineering and a minimum of three years of experience with digital hardware design, including demonstrated proficiency in using advanced FPGAs. Familiarity with analog-to-digital conversion, data compression, printed-circuit design, and high-speed test is also required. Knowledge of gate array or ASIC design is desirable. Responsibilities will include developing high-speed data-acquisition hardware for a large (60,000-channel) readout system, coordinating and defining overall system architecture, fiber optic links, signal processing, and power-distribution system. Physics Department.