the Bulletin

BROOKHAVEN NATIONAL LABORATORY

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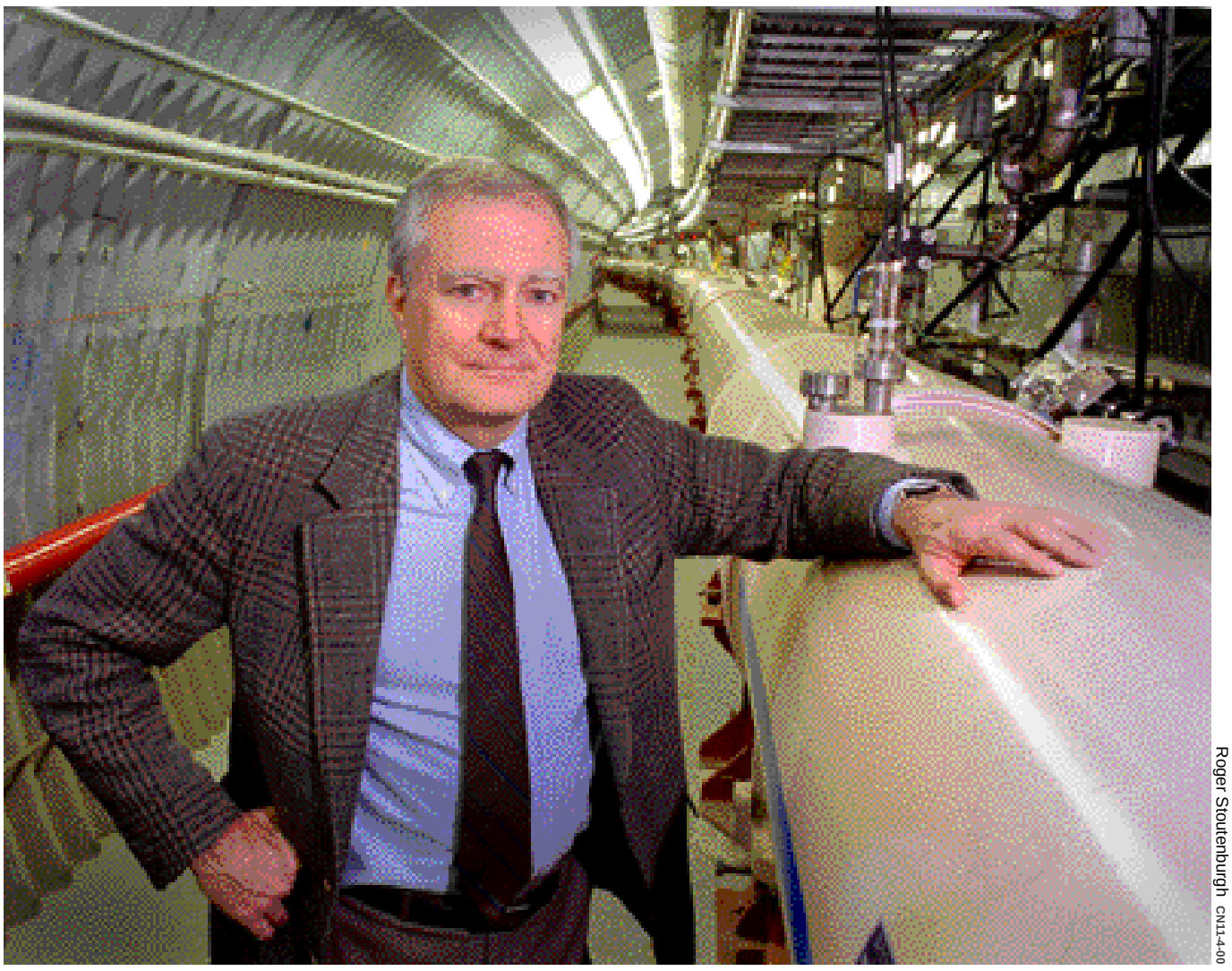
Lab Director John Marburger: Next Presidential Science Adviser?



BNL Director John Marburger stands beside a magnet in the Relativistic Heavy Ion Collider tunnel.

Roger Stoutenburgh CN11-4-00

On Monday, June 25, President George W. Bush announced his intention to nominate BNL Director John Marburger to the position of Assistant to the President for Science and Technology Policy, a position that traditionally includes the Directorship of the Office of Science and Technology Policy.

If confirmed by the U.S. Senate, Marburger would advise the President on all areas of science, including basic research, nuclear weapons, the human genome initiative, the space program, the Internet, and the training of scientists. He would also help the President fill many high-level scientific jobs in the federal government.

"Because of the importance of this position in the development of national science policy and in keeping the U.S. at the forefront of science and technology, if appointed and confirmed, I would be honored to accept the position," Marburger said.

"This nomination is a testament to Dr. Marburger's abilities as a scientist and manager of scientific programs," said Michael Holland, Manager of DOE's Brookhaven Area Office, which oversees operation of the Lab. "It also acknowledges the fine work Jack has done in revitalizing Brookhaven's science programs and restoring public trust in the Laboratory."

Various clearance investigations must take place before the Senate begins the confirmation process. And, because of the August recess, Senate confirmation hearings would most likely not begin until September, said Marburger in a statement issued on Tuesday. "This leaves time for an orderly transition of leadership at the Laboratory," he said.

At Marburger's request, Peter Paul, BNL's Deputy Director for Science & Technology, has agreed to remain as Deputy for as long as necessary to provide continuity during the transition, rather than return to Stony Brook University in the fall as he had planned.

"I am grateful to Peter for his willingness to accommodate this unexpected turn of events," Marburger said.

"This is an exciting opportunity for Jack and a great service to the science community," said Paul. "I'm happy to assist in any way I can through the period of transition so our excellent science programs at Brookhaven Lab can continue to flourish without interruption."

The Board of Directors of Brookhaven Science Associates will discuss the transition at its next meeting, which is scheduled for today, June 29.

Marburger added that, while he is eager to learn the opinions of his colleagues in science and discuss his ideas of what might be done as science adviser, he asks everyone to respect the integrity of the confirmation process. "This will require me to limit my contacts with media, with members of Congress, and others so as in no way to presume that confirmation is a foregone conclusion. I ask your patience as this process moves ahead," he said.

Shanklin, Whittle Push Enzyme Evolution Into High Gear

Work could lead to mass production of useful plant products

BNL biologists John Shanklin and Ed Whittle have found a way to make a plant enzyme that is 100 times more efficient than similar enzymes found in nature.

The research, described in the June 15, 2001 issue of *The Journal of Biological Chemistry*, offers insight into how enzymes evolve, and may one day lead to methods to boost production of other useful plant products.

"Plants make many valuable compounds, but often in small quantities," Shanklin says. Though not the direct focus of the BNL work, examples could include medicinal compounds and oils that may be useful as raw materials for industrial processes.

The biologists suggest that the reason for such poor production in nature is that the enzymes responsible are newly evolved. "That may seem strange, because many people associate evolution with improvement. But when enzymes evolve new functions, they almost always lose efficiency," Shanklin says.

Enzymes are proteins that speed up chemical reactions by bringing the reacting molecules together like pieces of a puzzle. Like all proteins, they are made of chains of building blocks called amino acids, folded in a precise way to give the enzyme its three-dimensional shape.

In nature, new enzymes arise from random mutations in the genes that code for the amino-acid sequence. Most changes have no effect. A very few improve the enzyme or give it a new function. But more often, the changes deform the enzyme, making it ineffective or unstable.

Over hundreds or even millions of years, natural selection might improve the new enzyme. But Whittle and Shanklin thought there might be a more direct way. "Could we evolve a better enzyme in the laboratory?" they asked.

The method

Shanklin and Whittle were interested in making a more efficient fat-modifying enzyme with properties similar to fat-modifying enzymes they had isolated from milkweed plants and cat's claw vines.

These slow-acting enzymes had evolved from a similar enzyme that was much more efficient, but modified a larger fat. To figure out how to turn the

(continued on page 2)

Support and encouragement

Meanwhile, BNL is abuzz with discussions of what Marburger's appointment could mean for the Lab and for science.

"It would be comforting to know that the Presidential Science Adviser is in tune with Brookhaven science," said BNL biochemist John Shanklin, Chair of the Brookhaven Council, which advises the Director on

(continued on page 2)

John Shanklin, Ed Whittle, Biology Department, seen with their super-efficient plant enzyme on the screen.

Roger Stoutenburgh CN6-135-01

Calendar
of Laboratory Events

- *The BERA Sales Office is located in Berkner Hall and is open weekdays from 9 a.m. to 3 p.m. For more information on BERA events, contact Andrea Dehler, Ext. 3347; or M. Kay Dellimore, Ext. 2873.*
- *Additional information for Hospitality Committee events can be found at the Lollipop House and the laundry in the apartment area.*
- *The Recreation Building (Rec. Bldg.) is located in the apartment area.*
- *Contact names are provided for most events for more information.*
- *Calendar events flagged with an asterisk (*) have an accompanying story in this week's Bulletin.*

— EACH WEEK —

Tuesdays: Welcome Coffee
10-11:30 a.m. Rec. Bldg. Newcomers meet friends. Mimi Luccio, 821-1435.
— Hospitality event

Tuesdays: Yoga Practice Sessions
12-1 p.m., Rec. Bldg., free. Bring mat. Ila Campbell, Ext. 2206.

Wednesdays: On-Site Play Group Now Meets in Playground
9:30 a.m. - 11:30 a.m. Playground in Apt. area, weather permitting. Parents meet while children play. Bring drinks, snacks. Free. Monique de la Beij, 399-7656., Lisa Fugleberg, 205-5128. — Hospitality event.

Wednesdays: Weight Watchers
noon-1 p.m., Brookhaven Center South Room, Mary Wood, Ext. 5923.

Tues. & Thurs.: Aerobic Dance
5:15 p.m., Rec. Bldg. $4 per class or $35 for any ten classes. Pat Flood, Ext. 7886; or Susan Monteleone, Ext. 7235.

Mon., Tues., Thurs.: Kickboxing
$5 per class. Mon. & Thurs. from noon-1 p.m. and on Tues. & Thurs. from 5:15 to 6:15 p.m. Registration is required. Mary Wood, Ext. 5923, or wood2@bnl.gov.

— NEXT WEEK —

Tuesday, 7/3

Spirit Dinner Cruise
SOLD OUT
Celebrate Independence Day Andrea Dehler, Ext. 3347; Rosalie Piccione, Ext. 3160; or M. Kay Dellimore, Ext. 2873.

Hospitality Barbecue
5:30 p.m., at Gazebo by apartments. Hamburgers, hot dogs, drinks will be offered. Bring side-dish or dessert to share. Nora Robles, 345-3204, or Luise Woltering, 744-7964.

— WEEK OF 7/9 —

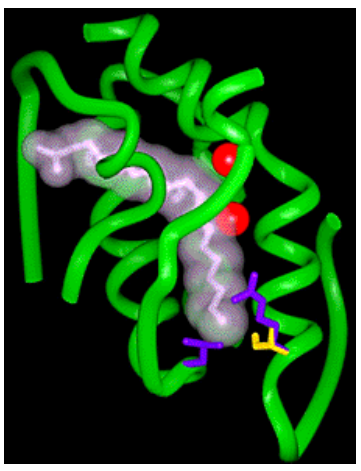
Thursday, 7/12

*Money Talks Seminar
"Financial Strategies for Single Parents." See notice on page 3. Joyce Wund, Ext. 7516.

BERA Bridge Club
7 p.m., Berkner Hall cafeteria. Morris Strongson, Ext. 4192, mms@bnl.gov.

Friday, 7/13

New York Mets Bus Trip
$40 includes tickets and bus to the New York Mets vs. Boston Red Sox. Bus leaves Brookhaven Center at 4:15 p.m. Andrea Dehler, Ext. 3347, or M. Kay Dellimore, Ext. 2873.



A model of the engineered enzyme's active site. The green lines represent the amino acid chain's backbone. The yellow lines show amino acid side chains from the original enzyme; the purple lines are evolved side chains. The white ghostly molecule is the fatty acid. The red spheres are iron atoms. Image by Bill McGrath.

Enzymes *(cont'd.)*

parent enzyme into one that could modify smaller fats without losing efficiency, the first step was to find out which amino acids in the parental enzyme could change the enzyme's specificity.

The scientists used a technique to introduce mutations, one or two at a time, into the ancestral enzyme gene. They then screened the resulting enzymes to identify those that could modify smaller fats. By sequencing the genes from those varieties they found six amino acid locations, out of 350 total, capable of changing the enzyme specificity.

They then synthesized genes for all the possible combinations of nature's 20 amino acids in those six spots, for a total of 64 million varieties. They inserted these genes into a bacterial strain requiring the new enzyme for survival. Most of the bacterial cells died because they lacked changes that were necessary to make the crucial enzyme. Those that did produce the enzyme thrived, and their genes revealed the identity of key mutations.

Now that the scientists knew which mutations would lead to the new enzyme, they could make only those changes in the original gene. The resulting enzyme turned out to be 100 times more efficient than the two varieties the scientists had isolated from nature. "We've now put this gene into *Arabidopsis* plants — the experimental fruit flies of plant science — and it works very well," Shanklin says.

As with all scientific research, struggles and setbacks were overcome along the way. The effort took three years of sustained commitment — and flexibility.

Says Whittle, "The elegance of this work is reflected in how our research focus evolved and how our approaches changed as we gained new knowledge of important amino acid substitutions. John's persistent vision that this approach would ultimately result in a far better enzyme was fundamental to this success."

In the future, the scientists say, their process of "tuning up" enzymes might be useful to produce large quantities of other plant products. For example, Shanklin suggests that, one day, plant products might be used to meet our growing need for industrial raw materials — perhaps even taking the place of petroleum-based chemicals. "The idea is to grow natural resources instead of taking them from a nonrenewable source," he says.

Now that's *evolutionary* thinking! — Karen McNulty Walsh

Marburger: Next Presidential Science Adviser? *(cont'd.)*

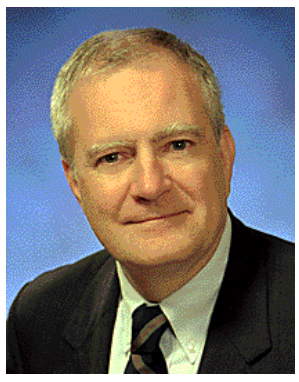
matters affecting the Lab's scientific staff. "Jack has shown outstanding leadership in educating our neighbors about the value and safety of BNL science," he continues. "The science adviser position would offer him the opportunity to continue this work by building public confidence and support for science at the national level."

William Hempfling, Director of Human Resources at BNL, had this to say: "I've had the chance to work closely with Dr. Marburger, and I've come to understand how much he truly cares for the Laboratory, our employees, our neighbors, and our guests. He is approachable and open to listening to the concerns of all. Like most effective leaders, he's able to balance the needs of a complex organization against the needs and desires of its employees. These qualities will serve him well in Washington if he is confirmed."

Era of scientific advances

Director of BNL since March 1998, Marburger has overseen an era of exciting scientific advances at the Lab. During his tenure:

- The Relativistic Heavy Ion Collider became operational and produced intriguing results in record time.
- Brookhaven scientists detected what may be the first truly significant deviation from the Standard Model of particle physics.
- BNL expanded its Center for Imaging and Neuroscience, advancing its groundbreaking studies of how various diseases, aging, and addictive drugs affect the brain.
- Brookhaven scientists began collaborating in a systematic study of human proteins, a logical outgrowth of the human genome initiative.
- Nine internal Laboratory organizations received ISO 14001 registration, an internationally recognized standard of excellence in environmental management. The entire



Roger Stoutenburgh CN8-188-00

Laboratory recently underwent an independent review and has been recommended for registration.

Marburger has also expanded Brookhaven's emphasis on technology transfer and collaboration with industrial partners.

In addition, he has played a significant role in advancing environmental restoration at the Laboratory. Acting on this commitment, he advocated the establishment of the Laboratory's Community Advisory Council to foster better communications with BNL's stakeholders.

Distinguished career

Before joining BNL, Marburger led a distinguished career in both science and education. From 1980 to 1994, he served as President of Stony Brook University. In the fall of 1994, he returned to the Stony Brook faculty, teaching and conducting research in optical science. Three years later, he became President of Brookhaven Science Associates, the partnership founded by Stony Brook and Battelle that was awarded the contract to manage and operate BNL for DOE.

A Maryland native, Marburger came to Long Island in 1980 from the University of Southern California (USC), where, in the 1970s, he had been a professor of physics and electrical engineering. He had served as Chair of USC's Physics Department and Dean of the College of Letters, Arts & Sciences.

While at USC, Marburger contributed to the field of nonlinear optics, an area of growing interest since the invention of the laser in 1960. He developed theories for various laser phenomena and was co-founder of USC's Center for Laser Studies. His teaching activities included "Frontiers of Electronics," a series of CBS-television educational programs.

Marburger's tenure at Stony Brook resulted in many noteworthy accomplishments. During his presidency, the University Hospital opened and biological sciences became one of the university's major strengths. During his term in the 1980s, federally sponsored scientific research at Stony Brook grew to exceed that of any other public university in the northeastern United States.

Other milestones during his term of office included: acquisition of the house of artists Jackson Pollock and Lee Krasner; creation of the on-campus Long Island State Veterans Nursing Home; improvement of athletic facilities, including the indoor sports complex; expansion and rehabilitation of major residence halls; revision of the campus master plan to revitalize the campus center and provide more activity space; construction of a campus sewage plant & cogeneration plant; and establishment of the Long Island Technology Incubator.

During his presidency at Stony Brook, Marburger served on numerous boards and committees. His service included being Chairman of the New York State Governor's Commission on the Shoreham Nuclear Power Plant and Chairman of the 80-campus Universities Research Association, which operates Fermi National Accelerator Laboratory near Chicago and the former Superconducting Super Collider Laboratory in Texas.

Marburger received a B.A. in physics from Princeton University in 1962 and a Ph.D. in applied physics from Stanford University in 1967.

For more information on John Marburger, go to: www.bnl.gov/bnlweb/Admin/marburger.html. — Karen McNulty Walsh

Less Tax Withheld

New withholding tables may reduce the amount of Federal Income Tax withheld from wages paid after June 30, 2001. The change is due to a reduction in the current 28 percent and higher tax brackets, effective July 1, 2001, resulting from the Economic Growth & Tax Relief Reconciliation Act of 2001.

If you do not want your withholding reduced, file a new Form W-4, Employee's Witholding Allowance Certificate. You may claim fewer witholding allowances on line 5 or request additional amounts to be withheld on line 6. The form is available in the Payroll Office, Bldg. 134, or may be downloaded from www.fsd.bnl.gov/payroll.htm.

Arrivals & Departures

Arrivals

Ralph B. James ..... Director's Office
Yu Zhao ..... NSLS

Departures

David S. Ellsworth ..... Env. Sciences

Indian Dance Recital, 7/1

The BERA Indo-American Association (IAA) invites the Lab community to the Bharatnatyam Dance Recital on Sunday, July 1, from 5 to 6:45 p.m., in Berkner Hall.

The South Indian classical dance will be performed by Upasana Upadyay, a ten-year-old who has won many awards for her dance performances; including the President of India Award and the government of India's National Child Award.

IAA suggests an $8 donation for those over 12 years of age who attend the recital. Children under 12 are welcome as well.

A catered vegetarian Indian dinner will be available following the recital at an additional cost of $8. For more information, contact Topé Achyut, Ext. 5672, or tope@bnl.gov.

Dosimetry badges will be exchanged today, Friday, June 29. Remember to place your badge in its assigned rack space before leaving work today.

Female High Schoolers Win Battelle-BWIS Awards

In a ceremony coordinated by BNL's Office of Educational Programs, five female high-school students who excel in science or mathematics were each given a $1,000 award to encourage them to pursue careers in those fields. Battelle and Brookhaven Women in Science (BWIS) established the award in 1999.

Every year, five school districts surrounding BNL are each asked to select a female student for the award. The school also displays a plaque on which the names of the awardees are engraved each year.

In the photo at right, the 2001 awardees are: (from left, front) Nicole Masone, Shoreham-Wading River High School; Jessica Watanasarnvechakul, Longwood High School; and Kathleen Brennan, Riverhead High School. Behind them are the Information Technology Division's Pam Mansfield, BWIS Scholarship Chair; and Laboratory Counsel Gregory Fess, representative for Battelle's Community Relations/Charitable Distributions Program.

In the photo at far right is awardee Elizabeth Vitaliano, William Floyd High School. The fifth awardee, Lauren Tedesco, Eastport High School, was not available for a photo.

Roger Stoutenburgh CN6-138-01

Holiday Note

The Lab will be closed for Independence Day on Wednesday, July 4. Therefore, there will be no Bulletin next Friday, July 6. The next Bulletin will be printed on Friday, July 13.

Money Talks Seminar, July 12

'Financial Strategies for Single Parents'

American Express Financial Advisors will present a "Money Talks" seminar on Thursday, July 12, at noon in Berkner Hall. The seminar, 'Financial Strategies for Single Parents,' will provide practical information to help singles with their finances. Topics will include:

- Paying for your child's college education
- Achieving the financial flexibility needed to make life-style changes
- Saving and investing for retirement
- Protecting your family from unexpected events
- Taking the full advantage of your learning potential.

Check mailboxes for registration forms. For more information, contact Joyce Wund, Ext. 7516.

Contacts for Benefits Office Service, 7/16-20

The Benefits Office personnel will be attending PeopleSoft training from Monday, July 16, to Friday, July 20.

So, during this period, for benefits matters that require attention, contact Nancy Concadoro at Ext. 2877 or concadoro@bnl.gov; or Joyce Wund, Ext. 7516 or jwund@bnl.gov.

BERA Summer Bash

Join BERA's Summer Bash on Friday, August 10, at the Rock Hill Country Club, Manorville. The party will begin at 6 p.m. Tickets are available at the BERA Store at $15/person and cover the hot buffet and DJ. There will be a cash bar.

Investment Advice

A Fidelity Investment representative will be at the Lab on Tuesday, July 31 to hold individual sessions with employees interested in learning more about their retirement savings and investment options.

To schedule one of the 45-minute appointments, call (800) 642-7131.

Classified Advertisements

Placement Notices

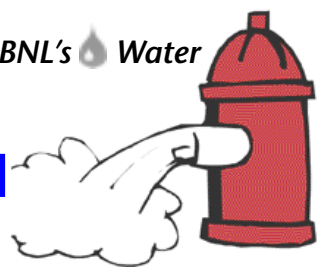
The Lab's placement policy is to select the best-qualified candidate for an available position. Candidates are considered in the following order: (1) present employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present 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 list of all job openings; use a TDD system to access job information by calling (631) 344-6018; or access current job openings on the World Wide Web at www.bnl.gov/JOBS/jobs.html.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

DD2090. ADMINISTRATIVE SERVICES ASSISTANT-(A-2, term appointment) - Requires an AAS in secretarial science or equivalent with excellent organization, communication, and computer skills. Demonstrated proficiency in Word, PowerPoint, and Excel also required. Must be able to work independently within established procedures, function effectively as a team member, and exercise initiative and good judgement within changing priorities. Will perform various tasks associated with the operation and administration of the Department including, but not limited to, processing personnel requisitions and travel requests, preparing correspondence, procedures, reports and presentations and administering the procedures associated with clinical research. Will provide other administrative support as required to support Department needs. Medical Department.

Improving the Quality of BNL's Water

Fire Hydrants To Be Flushed July 2-6



- **WHAT?** Fire hydrants will be flushed to clean the water-distribution piping.
- **WHY?** Flushing the hydrants will improve and maintain the quality of the Lab's water, eliminating "rusty" water.
- **WHEN AND WHERE?** Fire hydrants will be flushed Monday, July 2, through Friday, July 6:
  - ***Monday, July 2:*** Upton Road through the apartment area.
  - ***Tuesday, July 3:*** Cornell Avenue and its cross streets
  - ***Wednesday, July 4:*** no flushing because of the Lab holiday
  - ***Thursday, July 5:*** Brookhaven Avenue east to the Upton Forecast Office of the National Weather Service and west to Bldg. 51
  - ***Friday, July 6:*** Bell Avenue

FAUCET & FOUNTAIN NOTE: *Before drinking or using water during and after hydrant flushing, run the water in the sink, shower or fountain until the water runs clear. In some places, you may have to run the water for 5 to 10 minutes.*

LAUNDRY NOTE: *To make sure that discolored water is not used for washing clothes, the laundry in the apartment area will close at 8 a.m. on Monday, July 2. The laundry will reopen on Tuesday, July 3, at 10 a.m., and the washing machines will be ready for use, with clean water.*

- **WHO?** Fire hydrants will be flushed by the staff of the Water Treatment Facility in the Plant Engineering Division, with the help of the Fire/Rescue Group in the Emergency Services Division.
- **HOW?** Fire hydrants and valves will be opened and closed systematically. The water will pick up enough speed to carry out deposits within the supply piping. Hydrants will be flushed until the water runs clean.
- **MORE INFORMATION?** Call Marsha Belford, Ext. 5053, or Bill Chaloupka, voice pager 0552.

Calendar

(continued)

Saturday, 7/14

Bus Trip to Manhattan

$10 adults, $5 children under 12. Bus departs from Lollipop House 9 a.m., leaves NYC for BNL at 7 p.m. Call Nora Robles, 345-3204. Hospitality Committee event.

—WEEK OF 7/16—

Wednesday, 7/18

National 'Ride to Work' Day

If you own a motorcycle, then the BNL Cycletrons Motorcycle Club encourages you to ride to work on your two-wheeler. See www.ridetowork.org.

Cycletrons Lunchtime Reunion

Anyone interested in motorcycles is welcome, especially past and present members of the club. To R.S.V.P., contact Frank Dusek, Ext. 2022, by Monday, July 16.

Divorced & Separated Support Group

noon-1 p.m., Berkner Hall, Room D. Mary Campbell, Ext. 4776, maryc@bnl.gov.

Thursday, 7/19

Brookhaven Advocacy Council Meeting

Open Session, 12:30-1 p.m., Berkner Hall, Room D. Nancy Warren, Ext. 7548.

BERA Bridge Club

7 p.m., Berkner Hall cafeteria Morris Strongson, Ext. 4192, mms@bnl.gov.

—WEEK OF 7/23—

Monday 7/23

IBEW Meeting

6 p.m., Knights of Columbus Hall, Railroad Ave., Patchogue A meeting for shift workers will be held at 3 p.m. in the union office. The agenda includes regular business, committee reports, and the president's report.

Thursday 7/26

Celebration of Maurice Goldhaber's 90th Year

1:30-6 p.m., Large Seminar Room, Bldg. 510. See www.bnl.gov/bnlweb/pubaf/mg90.htm.

—WEEK OF 7/30—

Wednesday, 8/1

Divorced & Separated Support Group

noon-1 p.m., Berkner Hall, Room D. Mary Campbell, Ext. 4776, maryc@bnl.gov.

Thursday, 8/2

BERA Bridge Club

7 p.m., Berkner Hall cafeteria Morris Strongson, Ext. 4192, mms@bnl.gov.

Note: This calendar is updated continuously and will appear in the Bulletin whenever space permits. Submissions must be received by the preceding Friday at noon to appear in the following week's Bulletin. Please enter the information for each event in the order listed above (date, event name, description, and cost) and send it to bulletin@bnl.gov. Write "Bulletin Calendar" in the subject line.

Summer Sunday Tours Begin 7/8

In looking at the photo at right, you may wonder how a large vinyl egg can float in the air, and what that has to do with Bernoulli's principle? It's easy to find out just come to BNL's upcoming Summer Sunday tours.

The vinyl egg and the Bernoulli principle are among the intriguing items on the program in the "Whiz Bang Science Show" — a lively, interactive demonstration of basic scientific principles.

The Whiz Bang Science Show, which is popular with both adults and children, will be given in Berkner Hall four times a day during the tour days: at 10:30 a.m., 12 noon, 1:30 p.m., and 3 p.m.

The tours will run on eight consecutive Sundays, from July 8 to August 26, between 10 a.m. and 3 p.m. Admission is free and no reservations are needed.

This summer, the tours will feature exciting new interactive exhibits, as well as an inside look at a different Lab facility each week. A brand new, hands-on exhibit will engage participants in the scientific method, and robots, including those built by local high school students, will be demonstrated. Also, guided bus tours will run continuously throughout the day so that visitors can learn about other facilities which they might visit on another Sunday.

In addition, visitors are welcome to see the Camp Upton Historical Collection. Camp Upton was a U.S. Army training camp during World War I and induction center during World War II, before Brookhaven Lab was established on the site in 1947.

The tour program is organized and run by the Community Involvement Office. Last year, about 6,500 visitors attended the Summer Sunday tours.

Tour Schedule:

July 8 — Chemistry Department
Explore chemical reactions that govern the body, brain, and environment. See how chemicals are part of everyday life.

July 15 — Biology Department
Take a look into the fascinating world of biology and the important role it plays in gene sequencing and vaccine and drug development. Also, visit the greenhouses.

July 22 — National Weather Service
Visit the National Weather Service Upton Forecast Office from which all the day-to-day observations, forecasts, and warnings are issued. See the Doppler radar and computer technology that makes it possible. Attend a launch of a weather balloon at 1:30 p.m.

July 29 — Waste Management Facility
Tour this state-of-the-art facility, which was constructed with many unique environmental protection features. See what it's like to suit up in personal protective equipment.

August 5 — BNL Fire Station
Visit the firehouse and see demonstrations of emergency response equipment.

August 12 — National Synchrotron Light Source
See the light! Discover how infrared, ultraviolet, and x-ray light produced at the NSLS is used for scientific research in physics, chemistry, biology, medicine, and many other fields.

August 19 — Medical Department
Learn about BNL's clinical research on addiction, osteoporosis, obesity, and aging. Meet researchers who help NASA find out about the safety of extended space travel for humans.

August 26 — Atmospheric Sciences
Check out the sophisticated instruments used to study atmospheric aerosols, which are major contributors to climate change and air pollution.

Summer Sunday Tour of July 8th Features the Chemistry Department

Roger Stoutenburgh

How do you make slime? Or nylon? Come to the BNL Summer Sunday tour of the **Chemistry Department** on Sunday, July 8, and find out! These and other demonstrations will be shown as follows:

Main demos (15-20 minutes each)

- **Radioactivity:** Learn about radioactivity
- **Chemiluminescence:** Chemical reactions that give off light
- **Glass-Blowers:** Scientific glassblowers
- **Drybox:** Handling of chemicals that react with the air
- **LEAF Tour:** The Laser Electron Accelerator Facility (LEAF) is a particle accelerator that uses a laser to create ultrashort pulses of electrons (seven trillionths of a second) to study very fast chemical reactions.

Lobby demos

- **Making Nylon:** See how nylon is made
- **Making Slime:** Cross-linking polymerization to make slime
- **Oscillating Reactions:** What color is it now? (colors switch back and forth)
- **Iodine Clock Reaction:** How long will it take to react?
- **Carbon Dioxide:** Reactions of carbon dioxide.

the Bulletin

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LIZ SEUBERT, editor
JOHN GALVIN, reporter
ROGER STOUTENBURGH, photographer

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

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