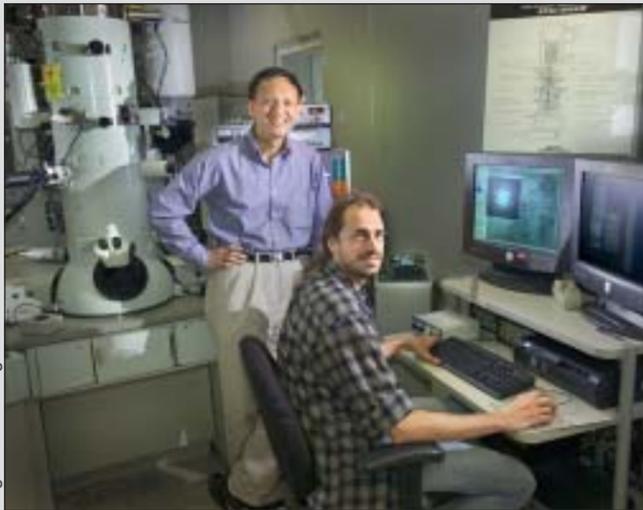


## High- $T_c$ Superconductor Plus Calcium Can Carry More Electric Current

**B**NL scientists have found evidence to prove why adding a small amount of calcium to a common high-temperature superconductor significantly increases the amount of electric current the material can carry. This research, funded by the Office of Basic Energy Sciences within DOE's Office of Science, and the German Research Foundation, may be a first step toward developing commercial applications for high-temperature superconducting materials. The results appeared in the May 15, 2004, issue of *Physical Review Letters*.



Yimei Zhu (left) and Marvin Schofield with TEM, the transmission electron microscope that made their research possible. TEM uses electrons as tiny probes to "see" inside materials.

"Many materials classified as high-temperature superconductors exhibit good properties only in single-crystal form and are actually unsuitable for practical applications, such as high-efficiency electrical wire, because their bulk composition — individual crystalline grains — disrupts the flow of electrons," said Yimei Zhu of BNL's Center for Functional Nanotechnology (CFN), who led the research.

"But for practical applications in which large electric currents need to be transported, such as power cables, the polycrystalline forms must be used. These polycrystalline materials carry a very low current compared to their single-crystal counterparts," he said. *(continued on page 2)*

## Unlocking Secrets of Titanium New research may lead to better catalysts for hydrogen fuel cells

**S**cientists at BNL and the New Jersey Institute of Technology (NJIT) have taken steps toward understanding how a titanium compound reacts with a hydrogen-storage material to catalyze the release and reabsorption of hydrogen. Their results, appearing in the July 19, 2004, issue of *Applied Physics Letters*, may help scientists learn how similar catalysts work, how to improve the catalysts' performance, and, possibly, how to develop more efficient storage materials for hydrogen fuel cells. This research was funded by BNL's Laboratory Directed Research & Development Program and the National Science Foundation.

In the late 1990s, scientists discovered that adding, or "doping," a small amount of titanium to sodium aluminum hydride, a hydrogen storage compound also known as sodium alanate, allows the compound to reversibly release and reabsorb hydrogen. In a sense, the titanium acts like a molecular "key," a crucial component that facilitates hydrogen absorption and allows the reaction to proceed more rapidly. Until now, however, the nature of that reaction was not well understood.

"We found that the titanium resides on the surface of sodium alanate as a titanium aluminum compound called titanium aluminide, rather than entering the bulk material and replacing other atoms or occupying empty spots within the lattice," said the study's lead author, Jason Graetz of the Energy Sciences & Technology (EST) Department.

To make their finding, Graetz and his collaborators, Jim Reilly and John Johnson, both of EST, and Alexander Ignatov and Trevor Tyson, *(continued on page 2)*



Jason Graetz

## 50 Years at Neutron Scattering Forefront Gen Shirane Honored at Symposium

**O**n July 15, the Physics Department hosted a symposium entitled, "Gen Shirane and the Frontiers of Neutron Scattering," to celebrate Senior Scientist Gen Shirane's 80th birthday and to honor his 50 years of forefront research in neutron scattering.

Some 60 participants attended the event from as far away as Japan, England, Canada and both coasts of the U.S.

Shirane joined the Physics Department 41 years ago. Since that time, as Lab Director Praveen Chaudhari noted during his welcoming remarks, Shirane has played a pivotal role in advancing knowledge on many fronts of solid state physics, with seminal contributions that include more than 700 papers. He has received numerous honors, including the Buckley Prize from the American Physical Society and election to the National Academy of Sciences.

Yasuhiko Fujii of JAERI, Japan, who chaired the first session of the symposium, recalled that through a U.S.-Japan cooperative agreement that started in 1981, Japanese scientists had been coming to BNL to do neutron scattering experiments for many years, using a state-of-the-art spectrometer they had built to share with BNL scientists at the High Flux Beam Reactor (HFBR). Last year, the Japanese Society for Neutron Science presented Shirane with its highest honor, a medal and citation for his out-

standing scientific accomplishments and contribution to the Japanese community through his nearly 40 years of training young Japanese scientists at the HFBR. John Axe, retired from BNL, chaired the second session and showed a list of nearly 100 "pupils" of Shirane who learned the art of neutron scattering from him at the HFBR.

The first speakers at the symposium were Robert Birgeneau, University of Toronto, and Roger Cowley, Oxford University, England, two of Shirane's longtime collaborators, who described some of their recent research. The next speakers, Andrey Zheludev, Oak Ridge National Laboratory, and Young Lee, Massachusetts Institute of Technology, are two of the current generation of neutron scientists who had considerable training by Shirane at the HFBR. The final speaker, Thomas Mason, Director of the Spallation Neutron Source, gave a perspective on the future of neutron scattering in the U.S. A dinner followed the symposium, featuring gifts and further remarks and reminiscences by Martin Blume, American Physical Society and BNL, and other attendees.

— Liz Seubert



Attendees at the symposium given at BNL to honor Gen Shirane (front, second from left).

## On the Fast Track

### International Symposium on Ultrafast Accelerators for Pulse Radiolysis

**T**he International Symposium on Ultrafast Accelerators for Pulse Radiolysis was held on June 25-28, at BNL's Chemistry Department. The meeting's purpose was to review the state of the art in ultrafast accelerators for pulse radiolysis, a technique that uses a pulsed beam of high-energy electrons to initiate and explore chemical reactions.

Participants met to discuss common experiences and challenges that various groups have encountered, to disseminate solutions that have been devised, and to look forward to new developments and capabilities. Forty people attended, representing 14 institutions in seven countries. The meeting, which was sponsored by Advanced Energy Systems of Medford, NY, and Brookhaven Science Associates, was organized by James Wishart and colleagues, including John Miller, Andrew Cook, Alison Funston, and Diane Cabelli, all of Chemistry.

Chemistry's Laser-Electron Accelerator Facility (LEAF) was the first ultrafast pulse radiolysis facility in the world to be based on the radiofrequency (RF) photocathode electron gun accel-

erator technology pioneered by the BNL Accelerator Test Facility and other groups. There are now eight RF photocathode accelerator-based pulse radiolysis facilities in operation or under construction worldwide, and more have been proposed. In addition, there are several high-power laser-based radiolysis systems under development. Said Wishart, "The new technologies are making ultrafast pulse radiolysis accessible to more chemists in more countries than ever before, and leading to a resurgence in the field of radiation chemistry."

The symposium included technical sessions on the design and performance of accelerator systems, experimental detection systems for ultrafast pulse radiolysis, experimental applications of these facilities, and technical round tables on operating experiences, problems and solutions in particular areas of concern for these specialized facilities.

For more information and PDF files of the presentations, go to [www.chem.bnl.gov/SciandTech/PRC/ultrafast\\_accel.html](http://www.chem.bnl.gov/SciandTech/PRC/ultrafast_accel.html).



The LEAF team: (front, from left) Isabel Abreu, Alison Funston, Sergei Lyamar, Jack Preses, Yan Jiang; (middle, from left) John Miller, James Wishart, Norihiko Takeda, Tomasz Szreder; (back, from left) Andrew Cook and Stephen Howell. Not pictured are Diane Cabelli and Richard Holroyd.

## 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 Chris Carter, Ext. 2873.
- Additional information for Hospitality Committee events can be found at the Recreation Bldg. and at the laundry, both 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 —

#### Weekdays: Free English for Speakers of Other Languages Classes

Beginner, Intermediate, and Advanced classes. Various times. All are welcome. Learn English, make friends. See [www.bnl.gov/esol/schedule.html](http://www.bnl.gov/esol/schedule.html) for schedule. Jen Lynch, Ext. 4894.

#### Mondays: BNL Gospel Choir

5:15-7 p.m. Berkner Hall. All faiths are welcome. [www.bnl.gov/bera/activities/choir/](http://www.bnl.gov/bera/activities/choir/).

#### Mon., Tues., & Thurs.: Kickboxing

\$5 per class. Mon. & Thurs. noon-1 p.m. in the gym; Tues., 5:15-6:15 p.m. in the gym; Thurs., 5:15-6:15 p.m. in Brookhaven Ctr. Registration is required. Christine Carter, Ext. 2873.

#### Mon., Thurs., & Fri.: Tai Chi

Noon-12:45 p.m., Brookhaven Center North Room. Adam Rusek, Ext. 5830 or [rusek@bnl.gov](mailto:rusek@bnl.gov).

#### Tuesdays: Welcome Coffee

10-11:30 a.m., Apartment area gazebo/playground. First Tuesday of every month is special for Lab newcomers and leaving guests. Cindy Ottemann, 849-2646

#### Tuesdays: BNL Music Club

Noon, North Room, Brookhaven Center. Come hear live music. Joe Vignola, Ext. 3846.

#### Tuesdays: Jiu Jitsu Club

6:30-7:30 p.m. in the gym. All levels, ages 6 and above. \$10 per class. Tom, Ext. 4556.

#### Tuesdays: Toastmasters

1st and 3rd Tuesday of each month, 5:30 p.m., Bldg. 463, room 160. Guests, visitors always welcome. [www.bnl.gov/bera/activities/toastmasters/default.htm](http://www.bnl.gov/bera/activities/toastmasters/default.htm).

#### Tues. & Thurs: Upton Nursery School

The school is on summer break. Contact Alison Tilp, Ext. 4465, or [tilp@bnl.gov](mailto:tilp@bnl.gov), for information on Sept. enrollment.

#### Wednesdays: On-Site Play Group

10 a.m.-noon. Apartment area gazebo/playground. An infant/toddler drop-in event. Parents meet while children play. Kati Petreczky, 821-4131.

#### Wednesdays: Farmer's Market

11:30 a.m.-1:30 p.m., Berkner Hall parking lot.

#### Wednesdays: Weight Watchers

Noon-1 p.m. Michael Thorn, Ext. 8612.

#### Wednesdays: Yoga Practice

Noon-1 p.m., Brookhaven Center. Free. Ila Campbell, Ext. 2206.

#### Wednesdays: Open Chess Night

5-8 p.m., Rec. Hall. Christine Carter, Ext. 5090.

#### Thursdays: Reiki Healing Class

Noon-1 p.m., Bldg. 211. Nicole Bernholz, Ext. 2027.

#### Thursdays: FreshDirect Delivery

3:30-5:30 p.m., Berkner Hall parking lot.

#### Fridays: Family Swim Night

5-8 p.m. at the BNL Pool. \$5 per family.

#### Fridays: BNL Social & Cultural Club

6-9 p.m., North Ballroom, Brookhaven Ctr., dance lessons, 9-11:30 p.m. general dancing. Rudy Alforque, Ext. 4733, [rudy@bnl.gov](mailto:rudy@bnl.gov).

### WEEK OF 8/2

#### Tuesday, 8/3

##### Caring Friends Meet

Noon, Berkner Hall, Room D. All are welcome to join an informal support group serving as a resource for individuals experiencing grief following the loss of a loved one. Call Pat Hein, Ext. 3962, or Gerry Van DerLaske, Ext. 3476.

##### Pegram Lecture Rescheduled: 10/19

The Pegram Lectures to be given by Richard Smalley, announced in the Bulletin of June 16, 2004, as starting on August 3, have been rescheduled. The First Pegram Lecture, "Our Energy Challenge," will be given by Smalley at 4 p.m. on Tuesday, October 19. The Second Pegram Lecture, "The Brave New World of Buckytubes," which was to have been on Tuesday, October 5, will now be given at 11 a.m. on Wednesday, October 20.

#### Wednesday, 8/4

##### ASAP/BSA Barbecue

The barbecue announced to start at 5:15 p.m. at Smith's Point, sponsored by the Association for Students and Postdocs, has been cancelled.

# Teachers, Students Build Cosmic Ray Detectors At BNL — for Data Collection During School Year

As part of QuarkNet, an educational outreach program sponsored by the National Science Foundation and the Division of High Energy Physics within DOE's Office of Science, 21 high school students from across Long Island spent one week at BNL in early July building cosmic ray detectors that they will use to capture cosmic rays and collect data. The goal of QuarkNet is to introduce high school students and teachers to the frontier of 21st century research that seeks to learn about the mysteries and structure of matter.

Helio Takai, a scientist in the Physics Department, is leading the team of 21 students, seven teachers and three student coordinators through the QuarkNet program. Assisting Takai are Denis Damazio, Linda Feierabend, Ken Sexton, and August Hoffmann, all of Physics; Tom Feierabend, Physics guest consultant; Tara Falcone, Office of Educational Programs (OEP), and Kenneth White, OEP Manager.

"We have been mentoring the teachers for the last four years. This is the first year the students have joined the program and it's been a wonderful learning experience for all," said Takai. "We are all looking forward to the data collection and analysis portion of the program. This is just the beginning of a long-term partnership linking scientists, teachers, and stu-

dents in a shared quest for information on the fundamental forces of nature."

In addition to the participating high school teachers from Long Island, the program also included teachers and professors from Maryland, the U.S. Merchant Marine Academy, and

selaer Polytechnic Institute. Suprabha Malhar, another student coordinator, attends Stony Brook University and plans to do her graduate work at BNL. Cristina Vianna, the third student coordinator for the program, is a Brazilian graduate student. She will be writing her

a summer student myself in the 1960s," he says. "BNL has a wide range of experiments and the partnership between the Lab and SCCC has proven to be an asset for all of us."

Warasila's colleague, Mike Inglis, who was recently hired as a professor of astronomy at SCCC, shares Warasila's enthusiasm. Says Inglis, "I may be a newly hired professor at SCCC, but I see a long-term relationship between the college and BNL. The week I spent at the Lab was extremely informative and worthwhile, and I am anxious to share the experience with my students."

Cosmic ray detection will begin this fall when students and teachers each take four detectors back to their schools. The data will be collected at each school and forwarded to a BNL-based computer using special software that was developed by Damazio. Throughout the school year, the students, coordinators and teachers will perform data analyses and ultimately publish a paper on their findings.

Another high school teacher, John Pisanic, Jr. from Baltimore, was also impressed with the program. "There's nothing better than participating in a program where you learn theory and then build something that you get to take home with you," Pisanic concluded.

— Jane Koropsak



Working together on building a cosmic ray detector are: (clockwise, from left) Dan O'Sullivan, Ward Melville High School student; Helio Takai, BNL Physics; Michelle Koone, Deer Park High School student; Harry Stuckey, Garden City High School physics teacher; and Jennifer Corbin, Roosevelt High School student.

Suffolk County Community College (SCCC).

Among the program participants, Joe Sundermier, a teacher at Deer Park High School, worked side by side with his daughter Julie, a student coordinator for the program who attends Rens-

thesis on this cosmic ray project and hopes to return to BNL to be mentored by Takai.

Robert Warasila, an SCCC professor of physical sciences, is no stranger to BNL. "I previously spent summers working in OEP at BNL and worked here as



QuarkNet participants at BNL, 2004

## High-T<sub>c</sub> Superconductor Plus Calcium (cont'd.)

Polycrystalline materials carry a low current load because of the problem of grain boundaries, the interfaces created between adjacent grains. At grain boundaries, incoming electrons slow down or change direction, thus losing momentum and releasing the lost energy as heat. This results in low electron flow across the boundaries — exactly the opposite of "good" superconductor behavior.

Researchers theorized that electric voltage barriers at the grain boundaries are the cause of this problem. Now, the BNL team has found evidence to support this theory.

"We discovered why grain boundaries are the predominant factor that limits the current flow in these materials," said Marvin Schofield, CFN, the paper's principal author. "By understanding grain boundary behavior, we can engineer grain boundaries with improved properties. This is a major challenge in superconductor research, which may lead to the commercialization of high-temperature superconducting materials that could revolutionize our daily lives in the near future."

Scientists worldwide have studied YBCO, a high-temperature superconductor named for the elements it contains: yttrium, barium, copper, and oxygen. They know that it conducts significantly better when it is "doped" with calcium, but have not known, until now, why this is true. The Brookhaven scientists determined this by comparing calcium-doped YBCO to undoped YBCO.

In undoped YBCO, the scientists found, the electrons encounter the most electrical resistance at the most misaligned regions, where the voltage barrier is wide and high.

Doping YBCO with calcium causes these regions to shrink, both in width and height. As a result, Schofield and his colleagues, who included Marco Beleggia, CFN, and additional collaborators Karsten Guth and Christian Jooss, both of the University of Gottingen in Germany, determined that calcium doping increases the current across the grain boundary by 35 percent. — Laura Mgrdichian

For more information, see [www.bnl.gov/bnlweb/pubaf/pr/2004/bnlpr060704.htm](http://www.bnl.gov/bnlweb/pubaf/pr/2004/bnlpr060704.htm).

## Unlocking Secrets of Titanium (cont'd.)

both of NJIT, first prepared two titanium-doped samples by mechanically mixing titanium chloride and sodium alanate using a planetary mill, a device that grinds substances together using marble-sized metal spheres. They then prepared two additional samples from each doped sample (for a total of six): a dehydrided sample (containing no absorbed hydrogen) and a hydrided sample. By working with both types, the researchers were able to study the titanium's properties before and after hydrogen absorption. This gave them one more way to determine the titanium's role in the reaction.

The group probed the samples with high-energy x-rays at beam line X19A at the National Synchrotron Light Source, a BNL facility that produces intense beams of x-ray, ultraviolet, and infrared light for research. Because every compound and element on Earth absorbs x-rays differently, having a unique "signature," the researchers were able to compare the six sample signatures to those of different titanium compounds and pure titanium. From this, they determined that the titanium chloride reacted with sodium alanate to form titanium aluminide.

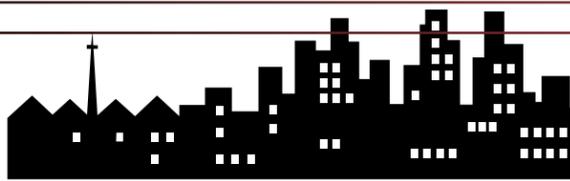
"Our finding is the first step toward an even more interesting discovery: determining exactly how titanium aluminide helps the hydride release and re-absorb hydrogen," Graetz said. "Understanding that mechanism may help us identify better catalysts for the sodium alanate system and help us find dopants for new compounds that are currently impractical energy-storage materials, due to the high temperatures and pressures required for the release and re-absorption of hydrogen."

— Laura Mgrdichian

For more information, see [www.bnl.gov/bnlweb/pubaf/pr/2004/bnlpr072304.htm](http://www.bnl.gov/bnlweb/pubaf/pr/2004/bnlpr072304.htm).

**Science Museum Open House, Noon, Fridays**

The extended BNL community, especially families living on site, is invited to come and experience the hands-on exhibits in the BNL Science Museum on Fridays, now through August 13, 11:30 a.m.-1:30 p.m. All children under 14 must be accompanied by an adult. Visitors may interact with the Mars exhibit, experience the shadow-wall display, and learn about wonders of science using materials from the Science Museum school programs. A limited supply of science toys will be available for sale at the Museum's science store.

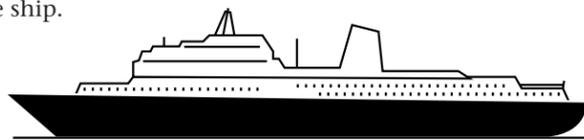


**Dream Cruise Round Manhattan, 8/7**

**Dockside cocktail reception, dinner, dancing, sailing past city lights under the stars . . .**

Picture yourself on a glamorous dinner-buffet evening cruise around Manhattan. At 4:30 p.m., you join a luxury bus at BNL to be driven to attend a dockside cocktail reception that starts at 7:30 p.m. Then, you board the ship for the sailing time of 8:30 p.m. — and now, as the boat moves smoothly through the water, here you are, mesmerized by the changing patterns of the city lights which grow brighter while the twilight fades and the stars gleam overhead. You'll soon be dining at a splendid buffet and dancing or watching others dance, as you prefer. Then, instead of having a long return car drive, you'll be snoozing on the comfortable bus to get back to BNL.

This dream, unlike most, can come true! Join BERA's dinner/dance trip to the Spirit Cruise on Saturday, August 7, for not much more than a very good dinner at a local restaurant. Buy tickets at BERA Store, \$82 per person, which includes the bus, cocktail reception, dinner, and entertainment. A cash bar is available on the cruise ship.



**Jazz Guitarist Craig Boyd Gives Concert at BNL, 8/20**

Jazz guitarist Craig Boyd, performing with his ten-piece band, will appear in concert at Berkner Hall on Friday, August 20, at 8 p.m. Boyd will play selections from his debut CD, called "Back on Track," at the public concert, which is sponsored by the BNL Music Club. All visitors to the Lab age 16 and over must bring a photo ID.

Craig Boyd started taking guitar lessons at the age of six and after playing in bands since age 11, chose music as his career. He has worked as a composer, arranger, producer and studio guitarist for name groups and solo artists. Currently, Boyd is Academic Chair of Music at Suffolk County Community College, and he is also a producer and engineer for numerous musicians, including Grammy Award-winning Dave Holland.

Buy tickets for the show, at \$20 each in advance at the BERA Sales Office, weekdays, 9 a.m. -3 p.m. At the door, tickets will cost \$25 each. For more information, call Ext. 3846.

**Retirement Counseling**

A TIAA-CREF representative will visit BNL on Friday, August 6, to answer employees' questions regarding the TIAA-CREF retirement plan, such as: TIAA and CREF differences; allocating funds between TIAA and CREF; options, flexibilities with TIAA-CREF; and retirement options. For a 45-minute appointment, call Valerie James, (800) 842-2733, Ext. 7980.

**Arrivals & Departures**

<b>Arrivals</b>	
None	
<b>Departures</b>	
David DuMont .....	C-A
Robert Hall .....	NN
Elizabeth Hutchinson .....	C-A
Anthony Krishock .....	C-A
Mark Pidkovich .....	Biology

**On-Site Service Station Tip of the Month**

Anyone who is thinking about buying new tires should remember that mixing tire types or sizes, or new with partially worn tires may cause unpredictable handling, braking, or loss of vehicle control. New tires should be installed on the rear axle. The Upton Services Inc., service station will be pleased to obtain and fit tires for you while you are at work. Call Ext. 4304 for more information.

**Port Jeff Sunset Cruise With Music, 8/11**

The Hospitality Committee invites the BNL community of all ages to join in on what has become a BNL tradition — the annual Port Jefferson Ferry Sunset Cruise, this year, featuring reggae music by King Wellington & The Earth Peeples. Meet at the Port Jeff ferry building on Wednesday, August 11, and purchase tickets on the boat at \$14.50 per person. The boat leaves at 5:30 p.m. and returns at 9 p.m. Come and create a fun evening! Bring a picnic

For more information, contact Cindy Ottemann at 849-2646 or cjottabb@optonline.net.

**Roll Up Your Sleeve: Blood Drive, 9/9**

To replenish Long Island's blood supply, BNL is holding a blood drive on Thursday, September 9, from 9:30 a.m. to 3 p.m. in the Brookhaven Center. Those eligible to donate are people in good health between the ages of 17 and 75 who weigh at least 110 pounds. Restrictions may apply to individuals from the United Kingdom and Europe. Donors should have a photo ID and know their social security number.

To make an appointment, contact Susan Foster at Ext. 2888, or e-mail donate blood@bnl.gov. In your message, include your name, phone extension, and preferred time to donate.

**DOE Seeks Public Comment On Graphite Reactor Cleanup Plan**

The U.S. Department of Energy (DOE) is seeking public comment on the proposed cleanup plan for the Brookhaven Graphite Research Reactor (BGRR) at BNL. The public comment period will be open from Monday, August 2, to Friday, September 3, 2004. The Proposed Remedial Action Plan for the Brookhaven Graphite Research Reactor and its accompanying Feasibility Study will be available starting next Monday on the BNL website at [www.bnl.gov/bgrr](http://www.bnl.gov/bgrr) and in local libraries, including the BNL Research Library.

The BGRR, which was the first reactor in the U.S. built solely to perform scientific research on peaceful uses of the atom, operated from 1950 to 1969. Deactivation of the facility was initiated in September 1969, and the last BGRR fuel element was removed in March 1972. The BGRR complex consists of several structures and systems that were used to operate and maintain the research reactor. Some parts of the equipment, structures, and soils are still contaminated.

As the result of its past operations, the BGRR currently contains approximately 8,047 curies of radioactive contaminants, including hydrogen-3 (tritium) and carbon-14, and fission products cesium-137 and strontium-90. The pile and biological shield contain over 99 percent of the remaining radiological inventory in the BGRR complex. Over the past five years, several interim cleanup actions have been completed, and others are now planned or under way.

Based on earlier investigations and input received from Brookhaven Lab's regulatory agencies and members of the public, DOE developed four cleanup alternatives for the graphite reactor. All four alternatives include the completion of actions that are currently under way or planned, followed by long-term response actions, including water-infiltration management, surveillance and maintenance, and institutional controls.

Early input received from the community and regulatory agencies indicated a strong preference for removal of the reactor pile and biological shield. After considering that and all other input, the U.S. Department of Energy is recommending Alternative "C" as the preferred cleanup remedy because it represents the best balance of the U.S. Environmental Protection Agency's criteria for selecting remedies and it best addresses the overall protection of human health and the environment.

This alternative results in the removal of the reactor pile, the biological shield, and contaminants that pose a threat of exposure through excavation of soils and potential migration to groundwater. It significantly reduces the threat to human health and the environment at a relatively small increase in the cost and expansion in the schedule compared to removal of the pile and biological shield alone.

Information sessions on the proposed plan will be held on Tuesday, August 17, 2004, from 2 to 4 p.m., and on Thursday, August 19, 2004, from 7 to 9 p.m., both in Berkner Hall. A public meeting will be held on Tuesday, August 24, 2004, from 7 to 9 p.m., also in Berkner Hall.

Formal written comments will be accepted from August 2, 2004 through September 3, 2004. Public comments should be mailed to Mike Holland, Site Manager, U.S. Department of Energy - Brookhaven Site Office, Bldg. 464, Attn: BGRR, P.O. Box 5000, Upton, NY 11973-5000. Comments can also be e-mailed to: [tellDOE@bnl.gov](mailto:tellDOE@bnl.gov), or faxed to: Ext. 3444.

Upon completion of the public comment period, DOE will review public comments and make a final decision on the cleanup remedy. A "responsiveness summary," in which the public comments and DOE's responses to them are compiled, will be part of a Record of Decision that documents the final cleanup agreement.

**Calendar**

(continued)  
**Thursday, 8/5**

**University of Phoenix Demo**  
10 a.m.-2 p.m., Berkner Hall. Representatives from the University of Phoenix Online, the largest accredited university offering web-based courses, will present BNLees with information on undergraduate and graduate degree programs. For more information, visit [www.uopx.com/nyc](http://www.uopx.com/nyc) or call John Cuevo, 1-800-618-6792, Ext. 1769. (Not the on-site Ext. 1769.)

**Saturday, 8/7**

**\*Dinner/Dance Cruise Round NYC**  
4:30 p.m. Leave BNL on luxury bus for cruise around Manhattan, with cocktail reception, dinner, dancing. \$82 each person. See notice at left for more information.

**WEEK OF 8/9**

**Wednesday, 8/11**

**Sunset Cruise on Port Jeff Ferry**  
5:30 -9 p.m. The Hospitality Committee invites all to join a trip from Port Jefferson to Bridgeport and back, to enjoy the water, reggae music, and a fun ride with friends from BNL. Bring a picnic supper or buy hot-dogs, etc., on board. \$14.50 each, buy tickets on board. See notice, below, left.

**WEEK OF 8/16**

**Tuesday, 8/17**

**\*Graphite Reactor Cleanup Info**  
2-4 p.m. Berkner Hall. Information session on proposed Graphite Reactor cleanup plan. All are welcome. See notice at left.

**Thursday, 8/19**

**BSA Distinguished Lecture**  
4 p.m., Berkner Hall. George Saliba, Columbia University, will give a talk on "Whose Science is Arabic Science in Renaissance Europe?" All are welcome to this free lecture, which is sponsored by BSA. Visitors to the Lab of 16 and over must carry photo ID.

**\*Graphite Reactor Cleanup Info**  
7-9 p.m. Berkner Hall. Information session on proposed Graphite Reactor cleanup plan. All are welcome. See notice at left.

**Friday, 8/20**

**\*Jazz Guitarist Craig Boyd in Concert**  
8 p.m. Berkner Hall. See notice at left.

**WEEK OF 8/23**

**Tuesday, 8/24**

**\*Graphite Reactor Cleanup Public Mtg.**  
7-9 p.m. Berkner Hall. A public meeting will be held on the proposed Graphite Reactor cleanup plan. All are welcome. See also notice at left.

**— WEEK OF 8/30 —**

**Thursday, 9/2**

**BNL Career Network Group Meeting**  
Noon, Berkner Hall, Room A. All are welcome. Cathy Wehrmann, Ext. 7823.

**— WEEK OF 9/6 —**

**Tuesday, 9/7**

**Caring Friends Meet**  
Noon, Berkner Hall, Room D. All are welcome to join an informal support group serving as a resource for individuals experiencing grief following the loss of a loved one. Call Pat Hein, Ext. 3962, or Gerry Van DerLaske, Ext. 3476.

**Thursday, 9/9**

**\*Blood Drive**  
9:30 a.m.-3 p.m., Brookhaven Center. Those eligible to donate are people in good health between the ages of 17 and 75 who weigh at least 110 pounds. Restrictions may apply to individuals from the United Kingdom and Europe. Donors should have a photo ID and know their social security number. Contact Susan Foster at Ext. 2888, or e-mail [donate blood@bnl.gov](mailto:donate blood@bnl.gov) with your name, phone extension, and preferred time to donate.

*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. Enter information for each event in the order listed above (date, event name, description, and cost) and send it to [bulletin@bnl.gov](mailto:bulletin@bnl.gov). Write "Bulletin Calendar" in the subject line.*



BNL-966-95-8

## Sunday, 8/1, Learn Uses of Synchrotron Light



Roger Stoutenburgh 08/18/02

On Sunday, August 1, visitors at BNL's Summer Sunday Tours will learn about "Seeing With Invisible Light" at the National Synchrotron Light Source, one of the world's brightest sources of x-ray and ultraviolet beams. Powerful beams of invisible light help scientists make remarkable discoveries that impact everyday life. Used by the 2003 Nobel Prize winner in chemistry and researchers from around the world, the Light Source has contributed to advances in medicine, materials, space travel and much more.

Tours are free and no reservations are needed. Visitors may arrive any time between 10 a.m. and 3 p.m. All visitors of age 16 and over must bring a photo ID.

Additional attractions are: a new hands-on "Light & Color" exhibit, produced by the Oregon Museum of Science & Industry; an exhibit on the 2003 Nobel Prize in Chemistry, researched in part at BNL; a demo by high-school students of a robot they built; and the "Whiz Bang Science Show," with new special effects, to be given at 10:30 a.m., noon, 1:30 p.m. and 3 p.m.

### Classified Advertisements

#### LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

NS4116. STAFF SPECIALIST (A-6) - Requires a bachelors degree in accounting, business administration or equivalent and at least five years related experience. Extensive administrative experience should include financial performance and analysis, accounting procedures and policies, coordination of program funding, budget and proposal preparation and financial reporting. Excellent written and oral communication skills, proficiency in Excel and other MS Office products and experience with PeopleSoft Budgeting, Personnel Forecasting, Queries and Reports required. Must be able to prioritize work and respond to tight deadlines in a fast-paced environment. Will assist in the overall management of administrative business activities and budget/proposal preparation in support of DOE and Work for Others Programs, in particular the Nuclear Regulatory Commission, Energy, Environment and National Security Directorate/Business Operations Office.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

MK4192. POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. in molecular biology/ molecular ecology or related

field relevant to microbial community analysis and natural gene transfer, preferable with a strong background in bioremediation of heavy metals/radionuclides having expertise with column experiments and mesocosm studies. Will be involved in research to study the effects of natural gene transfer and heavy metal stress on the composition of microbial communities in mesocosm studies. This work will involve the design and follow up of column experiments using molecular ecological tools under the guidance of both a soil chemist and a microbiologist. Under the direction of D. van der Lelie, Biology Department.

MK2782. POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. in chemistry or materials science with a strong background in organic or inorganic materials synthesis. Expertise in optical (i.e. Raman, fluorescence, UV-vis-near infrared) spectroscopy and microscopy (i.e. AFM, SEM, TEM, HRTEM) characterization techniques highly preferred. Under the direction of S. Wong, Materials Science Department.

MK3475. POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. or M.D. in neurology, with experience in brain anatomy, brain-imaging techniques with PET & MRI imaging. Will develop co registration of brain images, quantitative image analysis of brain structural (MRI) data and quantitative image analysis of brain radiotracers (PET, autoradiography). Will join a large neuroscience group interested in effects of drugs of abuse

and diseases on brain function. Imaging facilities include a 4 Tesla MRI scanner for human studies, a 9.4 Tesla MRI scanner for small animal studies, and three PET cameras. Employment is contingent upon the successful completion of a background check by the DEA (Drug Enforcement Administration). Under the direction of A. Biegon, Medical Department.

#### Motor Vehicles & Supplies

04 SUZUKI GSXR 1000 - motor cycle, blk., 3K mi., ask \$10,000. John Ext. 5912 or 874-2538.

03 HD FATBOY - Anniv. model, like new, blk./silver, helmet, 2K mi., \$18,000. Kevin, Ext. 2431 or 929-1683.

01 YAMAHA ROAD STAR - saddle bags, windshield, red/brown, excel. cond., 6K mi., \$7,800. Peter, 654-5844.

99 SATURN SL2 - a/t, a/c p/b, p/s, p/w, sunroof, new brakes & batt., orig. owner, 102K hwy. mi., \$4,100/neg. Lisa, Ext. 7524.

99 VOLKSWAGEN BEETLE - 5spd., a/c, p/s, p/w, blk., 29K mi., \$8,500. Masashi, Ext. 5984 or kaneta@bnl.gov

98 YAMAHA YZ800CC - performance exhaust, grip seat cover, new tires & clutch, extras, low mi., \$1,600. Ted, Ext. 5645 or 929-2812.

96 AUDI A4 - a/t, a/c, p/b, p/s, p/w, blk. leather int., moonroof, v.gd. cond., 88K mi., \$7,300. Yako, 474-1243.

95 SATURN SL2 - a/t, a/c, cass., new radiator & water pump, high mi. \$1,450. Richard, 878-2040.

93 BUICK STATION WAGON - p/b, p/s, p/w, c/c, 8 pass., hitch, hi/mi., \$2,500/neg. Richards, Ext. 7251 or 765-4147.

93 SATURN SC 2 - a/t, a/c, p/s, p/b, plum, sunroof, fm/cass., runs well, 110K mi., \$1,100/neg., Lenore, 589-2793.

92 FORD TEMPO - a/t, a/c, am/fm/cass., 4dr., white, excel. cond., 68K mi., ask \$1,800. Ed, 929-4522.

92 MAZDA PROTEGE, 5spd, a/c, p/s, runs well, needs work, 172K mi., \$500/neg. Sung, Ext. 4357.

91 SATURN SL2 - a/t, p/s, p/b, 147K mi., \$500. Marc, 803-2667.

89 TOYOTA PICK-UP - 5spd., 4cyl., 4WD, fiberglass cap, am/fm/cd, runs well, 151K mi., \$1,900. Charlie, 875-9426.

86 ALFA ROMEO GTV6, 2+2 sports, red/tan, leather, sunroof, orig. owner, 92K mi., \$3,400. Peter, Ext. 2913.

83 MERCURY COLONY PARK WAGON - all pwr., leather int., classic car cond., 75K mi., orig. owner, \$3,500. Rodney, 751-7023.

TIRES - 4 Bridgestone Turanza, EL42, 215/55/17, all season, 8K mi., orig. from '03 Maxima, \$200/firm. Mike, 281-8306.

#### Boats & Marine Supplies

18' ANGLER CENTER CONSOLE - '87. 115 Mercury w/trailer, weather Coast Guard pkg., more, \$4,200. Charlie, 875-9426.

11' SPEEDO - Catamaran Windsurfer, new sail, \$200. Mary, Ext. 2815 r 472-4087.

7' JETSKI - dual slip exhaust, 520 chain, excel. cond., rims, more, 10K mi., \$4,500. Judy, Ext. 5263 or 209-0709.

BOAT SLIP - deep water, Jamesport, Peconic Bay, up to 25', floating dock, Bill, Ext. 2906.

STEERING CYLINDER - Hynautic, side mount, hydraulic, ask \$50; 23' alum. outboard bracket w/23 setback, ask \$100. 878-8302.

#### Furnishings & Appliances

AIR CONDITIONER - Carrier, window unit, 7,600 Btu, 9.0 EER, 24-hr. timer, excel. cond. Joseph, Ext. 3966.

AIR CONDITIONER - GE portable, 7,000 Btu, used 1 summer, ask \$200. Norman, 399-1125.

BUNK BED - Futon, double below, single bed up, metal & wood frame, new, \$300. Heather, 929-4886.

CLIMBER/LOFT - wooden play climber with adjust. height loft, about 45 3/4" x 60 3/4". \$50. Cindy, 874-3652.

LOVESEAT - Jamesport Sterling, excel. quality & cond., rose/blue plaid, \$50; garden bench, ask \$50. Karen, 286-6133.

OVEN - self cleaning, blk./white; refrigerator, side-by-side, both GE, \$100/ea. Tony, 589-0695.

WASHER - Whirlpool, gold, extra quiet blk., \$200. Tony, Ext. 2711.

WASHER & DRYER - both in gd. running cond., \$100/both, you pick up. Tirre, 399-8383.

#### Tools, House & Garden

BRICKS - pavers gray, over 400, 25 cents ea. Rich, 589-9103.

LAWN MOWER - 21" Snapper, self propelled, gd. cond., \$80. Walter, 567-9025.

LAWN MOWER - self-propelled rear bagger, non-mulcher, requires a gd. tune up, \$60. Chu, Ext. 2389.

LATHE - Monarch 10EE, digital readout, 5c collet closer & new motor drive, ask \$2,700. William, Ext. 3799 or 754-3469.

#### Sports, Hobbies & Pets

BICYCLES - women's Murray, 26", 15 spd. Mtn. bike, \$40; 1 men's Ross, 27", 10spd., \$30, both in gd. cond., Walter, 567-9025.

BICYCLE - Trek 220, boy's 18 spd. w/ 24" wheels, for 8- to 12-yr. old, \$50. Scott, 874-3652.

PAINTBALL GUN - JT 3.5 semi-auto. marker, 200 rd., hopper, 12 oz. CO<sub>2</sub> tank, great for beginners, \$100. John, Ext. 7411.

POKER CHIPS - 500, 11.5 grams, alum., case w/cards & dice, new, excel. gift, 70, have several. Paul, Ext. 5829 or 289-9152.

SOFTBALL CLEATS - Nike, 10 1/2, used 2 innings, \$20. Bob, Ext. 4758.

SKATES - inline, CCM Tacks, men's 9 1/2, new in box, \$35. Robert, Ext. 4758.

SWING SET - Wood Kingdom, 2 swings, fort w/slide, climbing tower, gd. cond., \$400. Lloyd, 422-6252.

#### Audio, Video & Computers

PRINTER - HP340C portable, great for laptop, 2 new cartridges, \$20; BJC 4300 color printer, \$10. Scott, 744-4237.

#### Miscellaneous

CRIBS - (2) Simmons & Simmons beauty rest mattresses, mint cond., \$175/ea. John, Ext. 7018.

FAUCETS - Moen, like new, single level, chrome, 3 avail., b/o. Bill, 452-1726.

GOLD CHAIN - solid 14K, heavy curb, 22", \$375. Linda, Ext. 2733 or 395-6784.

INGROUND POOL BAR - 2 seats, table & umbrella for igp use only, brand new in box, \$250. Rodney, 751-7023.

SANDBOX - Fisher Price, excel., \$15. John, Ext. 4028.

UNIQUE PIÑATAS - all occasions & characters, cartoon, Disney, Sesame Street. Donna, 821-0359.

#### Lost & Found

LOST - brown T-shirt on Sat., 7/17, in Compton House, Bldg. 170 and laundry rm. Yunpeng, Ext. 2229 or 1729.

#### Free

LAWN MOWER - riding, does not run. Walter, 567-9025.

ROOM & BOARD - + \$1,000/mo. in exchange for home care for BNL retiree in Islandia, priv. rm. w/ac & ent., help w/ home/garden chores, 348-7199/Immed.

#### Wanted

APT/HOUSE TO RENT - 3 to 4 months; cond. & size unimportant; non-smkr. single scientist w/cat. Pat, Ext. 3902 or 929-8165.

CAT SITTER - for 9yr. old in BNL apt. area, portions of 8/04-11/04, \$10/visit/neg. Mary, Ext. 4877 or 344-1034.

KITCHEN CABINETS - used, reasonable. Edouard, 369-7265.

RECORDS - 50s-present, esp. 45 rpms., I'll give them a gd. home. Kathi, Ext. 7661.

RENTAL HOUSE - waterview/front, 2+ more bdrms., north shore from Sound Bch., east to Baiting Hollow, Moira, 774-0599.

RESEARCH VOLUNTEERS - men and women, ages 18 and over, are needed for PET study. Strictly confidential, fee provided. 344-5015.

SHOTGUN - model 870 in 410Ga. Joe, Ext. 3783 or 929-8321.

#### Happenings

Old Ship Of Zion Church annual Craft and Flea Mkt. Fair, 8/28, 9 a.m.-4 p.m., 145 Frowein Rd., Ctr. Moriches, \$30 per space, 12x12, more info, 878-1115 or 475-1811.

#### For Rent

BELLPORT - rm in home, kit. privileges, quiet, mature, prof./serious grad student no smkg/pets, \$750. Karen, 516-446-0154.

CORAM - roommate needed, share 2 bdrm. apt. no smkg/pets, 20 min. to BNL, \$675/incl. util. David, 744-8015.

FARMINGVILLE - 2-bdrm. house, avail. 8/1, fenced yd., hwdw flrs. in l/r, bsmt, deck, quiet area, \$1,400+ sec. Rose, 419-1080.

HUNTINGTON - 2-3 br. apt. in house, kit, l/r, fin. bsmt. w/w/d, heat, gar. incl., \$1,800. Gerry, 427-7176.

MILLER PLACE - 1-bdrm. apt. w/use of fenced back yd., fully furn., 9 mi. to BNL, non smkr. 744-8386.

PORT JEFFERSON - new, 1 br., full bath, l/r, eik, priv. ent., \$1,200. Eileen, 732-0866.

SELDEN - 3-bdrm. apt. in priv. house, l/r, d/r, eik, full bath, hardwood flrs., deck, yd., prkg. \$1,850, incl. heat, sec., 15 min. from BNL. Helen, Ext. 5675 or 642-7435.

ARUBA - Marriott/share mstr. suite, 2 bdrm. lockoff, q-bed, sofa bd, sleeps 4, kit., lr, dr, fb, \$1,200; Studio, q-bed, sofa bd., sleeps 4, fb wetbar, \$700, wk. 11/5-12. Bob, 467-5853.

#### For Sale

EAST PATCHOGUE - 5-bdrm. Colonial, gt. rm. w/F/P, 3.5 baths, full bsmt., oak flrs., d/r, l/r, shy 1 acre. Kim or Dave, 286-5507.

EAST YAPHANK - 4-bdrm. Colonial, flr, fdr, den, 1.5 baths, eik, new FL. rm., .5 fin. bsmt. 1/3 acre, \$359,000. Marion, 331-3143.

MEDFORD - land, 100x173, 180/neg. Cynthia, 698-9016.

WADING RIVER - 4-bdrm. ranch, l/r, d/r, kit, 2.5 bath, den, cvac, deck, porch, igs, more, on .8 secluded acre, \$479,000. Heather, 929-4886.

## Volunteer Expo: 'Sharing Our Caring'

To: All the Lab community, including employees, visitors and facility users, retirees, subcontractors, and their families

From: BNL's Volunteers in Partnership Committee

Did you know that several people at the Lab give up time to help "Response," a 24-hour hotline that lonely people may call when they feel a breath away from suicide? Other Lab community volunteers are involved in helping run a local soup kitchen, the Meals on Wheels service, and Boy and Girl Scouts. In fact, many people within the Lab community have strong links with or volunteer for charitable or service organizations.

The BNL Volunteers in Partnership Committee is holding a "Volunteer Expo" at Berkner Hall in the fall, so that agencies proposed by the Lab community can be invited to come to BNL and display information about their work.

Why not highlight your volunteering efforts and perhaps gain new members for your organization by taking part in the Volunteer Expo, which will:

- 1) promote and celebrate volunteerism
- 2) show the variety of volunteer work being done by Lab people
- 3) provide opportunities for other Lab community members to learn about organizations for which they can volunteer.

If you are interested or have any questions, complete the following form and mail it to: VIP-Volunteer Expo, Bldg. 134A, to arrive by Friday, August 13. A VIP representative will contact you.

### Volunteer Expo

'Sharing Our Caring'



Are you currently involved in a community volunteer activity?

Yes  No

If yes, then would you like your volunteer organization to be represented at the BNL Volunteer Expo?

Yes  No

If yes, then please provide the following information:

Name of organization(s)

Your Name

Bldg. Number

BNL Phone Ext.

e-mail address

Return completed form to VIP, Bldg. 134A, by August 13.