

Inhibitors of Important Tuberculosis Survival Mechanism Identified

Compounds kill dormant pathogen, spare human cells — could lead to new medication

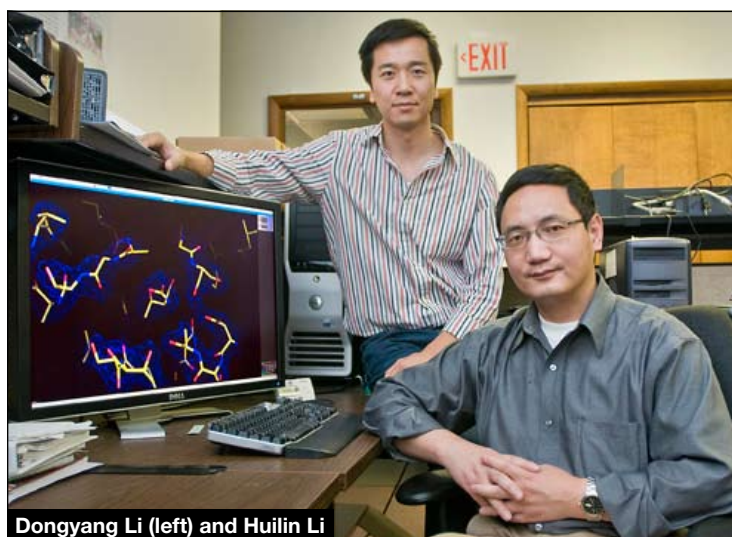
Attempts to eradicate tuberculosis (TB) are stymied by the fact that the disease-causing bacteria have a sophisticated mechanism for surviving in a dormant state in infected cells.

Now, a team of scientists including researchers from BNL, Stony Brook University (SBU), Weill Cornell Medical College (WCMC), and The Rockefeller University (TRU) has identified compounds that inhibit that mechanism — without damaging human cells. The results, described in the September 16, 2009, issue of *Nature*, include structural studies of how the inhibitor molecules interact with bacterial proteins, and could lead to the design of new anti-TB drugs.

“Our structural studies reveal the detailed mechanism

by which these inhibitor molecules work, and explain the species selectivity that allows them to disable TB while largely sparing human cells,” said co-corresponding author Huilin Li of BNL’s Biology Department and an associate professor at SBU. Other authors were: co-corresponding authors Gang Lin and Carl Nathan, WCMC; Dongyang Li, BNL; Luiz Pedro Sorio de Carvalho, WCMC; Haiteng Deng, TRU; and Hui Tao, Guillaume Vogt, Kangyun Wu, Jean Schneider, Tamutenda Chidawanyika, J. David Warren, all of WCMC.

Mycobacterium tuberculosis, the bacterium that causes TB, infects one person in three worldwide. Most infected people remain symptom-free because the bacterium is kept in



Dongyang Li (left) and Huilin Li

check within immune system cells. These cells produce compounds such as nitric oxide, which scientists believe damage or destroy the bacteria’s pro-

teins. If allowed to accumulate, the damaged proteins would kill the bacteria.

But TB bacteria have a sophisticated way to remove the

damaged proteins — a protein-cleaving complex known as a proteasome — identified in earlier research by this same team (see www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=06-19). By breaking down damaged proteins, the proteasome allows the bacteria to remain dormant, and possibly go on to cause active TB. Finding drugs to disable the proteasome would be a new way to fight TB.

In developing proteasome-inhibitor drugs, scientists face several hurdles. For example, human cells also possess proteasomes, which are essential to their survival. To be effective, the drugs would have to specifically target the TB proteasome without adversely affecting the human protein-cleanup complex.

See *Tuberculosis* on pg. 2

New Science Book Published About Large Synoptic Survey Telescope

A very special book, the *Large Synoptic Survey Telescope Science Book*, was published on October 16. It describes the design planning and science goals of a very special instrument, the Large Synoptic Survey Telescope (LSST), which is to be constructed high on a mountaintop north of Santiago, Chile. With an extremely large, nearly 10-square-degree field of view, and only 15 seconds needed per exposure, the LSST will be able to record images of the entire sky every three days.

Michael Sivertz of the Collider-Accelerator Department (C-AD) is one of the editors of the *LSST Science Book* and he is a contributing author of the “System Design” chapter. The book, which can boast 243 contributing authors from 95 institutions spread across 16 countries, outlines the most exciting prospects for discovery that an instrument like the LSST makes possible.

“With this publication, the LSST takes one step closer to the realization of a decades-long dream of many scientists and astronomers: making a movie of the stars,” said Sivertz. “Over the ten-year observing program, the combination of wide-deep-fast viewing will give us approximately 1,000 images of every star through six different color filters. We’ll be making a color movie where every star gets to be a ‘Star.’”

The October publication of the *LSST Science Book* is the second edition: Version 1.0 was released as part of the LSST presentation to the Astro2010 Decadal Survey committee, 7-11 June, 2009, in Pasadena, CA. After that meeting, a panel of experts makes recommendations for the future of research in astronomy. The Science Book will be used in preparation for



Several members of the BNL Journal Club, who meet weekly to discuss astronomy and astrophysics relevant to the Large Synoptic Survey Telescope Science Collaborations: (back, from left) Erin Sheldon, Zhaoming Ma, John Haggerty, Tom Throwe, Jim Frank, and Mickey Chiu, all of the Physics Department; (seated, from left) Waldo MacKay and Michael Sivertz, both of the Collider-Accelerator Department; and visitor Paul Stankus of Oak Ridge National Laboratory. Unable to be present were members from the Instrumentation Division: Paul O’Connor, Ivan Kotov, and Peter Takacs.

the LSST Preliminary Design Review to be conducted by the National Science Foundation in 2010, after the findings of the Decadal Survey are released.

BNL’s LSST Role

BNL is contributing to the LSST project through the sensor development (24 July 2009 Bulletin and www.bnl.gov/today/story.asp?ITEM_NO=1357) undertaken by the Instrumentation Division, which is experimenting with a new generation of charge-coupled devices having greater sensitivity, better resolution, and faster readout time than those used in today’s astronomical cameras.

Also, a team in the Physics Department is involved in the LSST scientific research plans through sensor development, calculations and simulations.

Said Tom Ludlam, Physics Chair, “The focus of Brookhaven’s astrophysics initiative is the phenomenon of dark

energy: the unknown force that causes our universe to expand at an accelerating rate. This recent discovery is absolutely fundamental to the evolution and structure of the universe, and its study requires the most powerful astronomical measurements ever undertaken. Brookhaven has a long history of basic research in the fundamental forces of nature using ‘big science’ facilities. Our participation in LSST continues this tradition, not only in scientific leadership, but also in the cutting edge instrumentation and computing capabilities that characterize a forefront national laboratory.”

Great interest in the LSST has been evidenced at BNL at least since February 2006, when John Haggerty of the BNL Physics Department started a Journal Club that included members of Physics, C-AD, and Instrumentation. The club has been meeting weekly to cover the...

See *LSST Book* on pg. 2



Interactive New BNL Website Now Online

BrookhavenSphere: Promoting Collaborative Science, Technology

Q. You might have an idea for a new research topic or technological advance and you know that various colleagues across the Lab could help in fleshing it out and making it a reality. Short of calling a Lab-wide lunchtime meeting that many people would be too busy to attend, how could something like that work?

A. The answer is the BrookhavenSphere website, a new concept for getting together and discussing ideas that has been started by Lev Neymotin of the Nonproliferation and National Security Department.

Why Have a BrookhavenSphere Website?

The objective of the new website is to establish a cyberspace environment for the entire BNL community to pose and, in a collaborative way, solve scientific and technological problems, enhancing discourse and innovation and promoting cross-cutting basic research and R&D activities. The site uses a wiki database modeled on the software behind the widely known online user-contributed encyclopedia Wikipedia. You can access the site at <http://intranet.bnl.gov/brookhavensphere>.

Neymotin explains that there are three major phases in the life of any idea. The first two are formation of an original hypothesis and articulation of a proposal leading to a funded basic research or R&D project. The third, final and perhaps most rewarding phase is commercialization of a proven concept, recognition of a concept by the larger society, world acceptance of a scientific idea by a community in a specific field of knowledge — and even recognition through awards like the Nobel Prize.

“The BrookhavenSphere will focus on the first two phases of this process,” says Neymotin. “This will open the idea to brainstorming suggestions from the minds of a group — potentially the entire BNL community — which could collectively transform the idea into a funded basic research or R&D proposal.”

So How Does It Work?

As an example, suppose that someone submits a proposal to the wiki database for a “biological electric generator,” that uses the mechanism employed by the electric eel. Anticipating the...

See *BrookhavenSphere* on pg. 2

Tuberculosis from pg. 1

A WCMC team of scientists led by Nathan screened 20,000 compounds for TB proteasome inhibition activity. They identified and synthesized a group of inhibitors, which they then tested for their ability to inhibit the proteasome inside the mycobacteria. They also tested the compounds' effect on monkey epithelial cells and human immune system cells in culture.

Two compounds proved effective against the TB bacteria while showing no apparent toxicity to mammalian cells. Additionally, the compounds exerted no antibacterial activity against a range of other bacteria, demonstrating that they appear to have a high degree of specificity for the TB microbes. The inhibition of the TB proteasome also appears to be irreversible and about 1,000-fold more effective than the minor inhibition observed against human proteasomes.

To learn more about the inhibitory mechanism and the basis for its species selectivity, Li's group determined the atomic-level crystal structures of TB proteasomes following exposure to the inhibitors. These studies were performed mostly at the National Synchrotron Light Source (NSLS) beamline X29.

The structural studies revealed that the inhibitor molecules block the proteasome's ability to degrade proteins in more than one way: by producing a direct chemical change to the proteasome active site, and by altering the conformation of the "pocket" into which protein fragments bind before being degraded.

"This conformational change constricts the pocket to the point that it cannot accommodate a protein substrate," said Li. "The many amino acid residues of the TB proteasome involved in this conformational change, some far away from the active site, are different from those in human proteasomes. This might explain why such dramatic inhibition is not observed in the human proteasome, as the human enzyme may not be able to undergo the same structural change."

A detailed understanding of the steps by which these inhibitors cause the conformational changes could therefore guide the design of the next generation of anti-TB drugs.

This research was funded by grants from the National Institutes of Health (NIH) and the Milstein Program in Chemical Biology of Infectious Diseases at WCMC. The NSLS at BNL is supported by the Office of Basic Energy Sciences within the DOE Office of Science.

— Karen McNulty Walsh

For more on this research, see www.bnl.gov/bnlweb/pubaf/pr/PR_display.asp?prID=996.

Arrivals & Departures	
— Arrivals —	
Richard Lynch.....	NSLS-II
Rocco Tuccio.....	C-AD
— Departures —	
None	

'There's No Place Like Home'

"There's no place like home." That's what several BNLeers are saying after receiving grants from the Lab's housing assistance program and the Long Island Housing Partnership toward the down payment for their first home.

In early 2009, the Lab partnered with the Long Island Housing Partnership (LIHP) under the "Employee Assisted Housing Program" to work with employees who may qualify for a BNL contribution of up to \$5,000 toward the purchase of their first home, and for additional grant funding through the LIHP.

Coordinating the Lab's program are Ernie Tucker and Liz Gilbert of the Human Resources & Occupational Medicine Division. They review applications and link employees with staff at the LIHP. In addition to the grants, the LIHP offers financial guidance on the mortgage process to first-time home buyers. The LIHP also offers counseling and information on refinancing and default mortgage loans.

Tucker said there are currently eight employees participating in the Lab's program.

"I must note that without the help of John Hauser, the Assistant



Pictured are some of the recent participants in the BNL Housing Program. Seated are Ernie Tucker and Liz Gilbert, Human Resources and Occupational Medicine, who coordinate the program. Standing, from left are: Nicole Jenkins, Safeguards and Security Division; Christine Giammarino, Fiscal Services Division; and John Galvin, Community, Education, Government, and Public Affairs. Ray Filler, National Synchrotron Light Source II, was unable to be present because he was busy unpacking at his newly acquired home the day this photo was taken.

Laboratory Director for Finance at the time the program started, I don't think our program would be as successful," said Tucker. "John really jump-started things by coordinating the financial portion for BNL."

Hauser was happy to be part of a program that was so beneficial to employees. "When Ernie approached me about this, I thought

it was a wonderful opportunity for BNL to demonstrate its commitment to employees," he said. "Home ownership is a big part of the American dream, and BNL is all about good people improving the quality of life. In this instance, everybody benefits."

John Galvin of the Community, Education, Government & Public Affairs Directorate was one of the

first employees to apply for grant money through the program.

"I was extremely pleased and thankful, not just for the monetary assistance from the Lab and LIHP, but for the financial guidance I received from LIHP that helped me fully understand the mortgage and house-closing processes," said Galvin. "I was amazed at how smoothly the process went. Under the LIHP program, funds can also be granted to refurbish and update existing homes, for items such as siding, windows, and heating systems. I am currently in the process of having my home vinyl-sided. With the help of this program, I am enjoying home ownership."

Christine Giammarino, who works in the Fiscal Services Division, is scheduled to close on her home in the next few weeks.

"Once I heard about this program from Ernie Tucker, I started spending my free time looking at houses in various neighborhoods," she said. "It took me some time, but I believe I have found the perfect place for me and my son to call home. I will be forever grateful for the assistance I have received from the Lab and LIHP."

See *Housing Program* on pg. 3

BrookhavenSphere from pg. 1

...need for cooperation with biologists, physicists, chemists, engineers, and instrumentation specialists, the text of the proposal record would identify those categories explicitly, allowing the title of the idea and its link to appear in several sections of the Sphere Article Index page.

As the work progresses, those involved would use the "discussion" feature of the wiki for talking specifics and converging on solutions that will eventually make it to the final version of a collaboratively developed proposal. Once the ad-hoc project team is satisfied with the proposal, it would submit it for funding at the Lab or outside.

Currently, several initial project proposals have already been started in the Sphere.

Adds Neymotin, "Special thanks are due to Chris Weaver and David Cortijo of the Information Technology Division for their excellent technical support in installing and maintaining the website."

Two Challenges

Two of the challenges to the successful implementation of the BrookhavenSphere concept are protecting ownership of the idea or hypothesis and discovering an acceptable reward mechanism for the intellectual effort spent on producing them.

Protection of ownership is fairly straightforward: those who devise and contribute to an idea with a commercial or scientific potential will have references to their authorship and contributions automatically stored using the wiki's "history" feature.

With commercialization, the conventional system of patents and copyrights would remain as the mainstream mechanism for managing the ideas. Although rewards or remuneration — including public recognition — are anticipated in the third phase of the life of an idea, the first two phases can be richly awarding too, being driven by innate intellectual curiosity and desire for engagement in the act of discovery.

Bigger Is Better

"As with any system designed for performing complex actions, the size and complexity of the system must be commensurate to the task, so the size of the BrookhavenSphere will be a critical element to its success," comments Neymotin. "Its expansion beyond the Lab — to universities, other national labs, and the world — seems to be a logical path forward once the concept proves itself and any legal, organizational, or international issues are addressed and resolved. I encourage you to join, explore, and enjoy the Sphere!"

Note: This article first appeared in the Monday Memo of Oct. 26, 2009. For more information, contact Lev Neymotin at neymotin@bnl.gov.

In Memoriam

Richard Schultz, who joined the Medical Department as a senior veterinarian services assistant on October 29, 1979, moved to the Biology Department in 1984, and retired as a laboratory specialist on March 31, 1995, died on June 28, 2009. He was 76.

Henry Farrell, who joined the Alternating Gradient Synchrotron Department as an intermediate technician on July 18, 1960, and was named a technical supervisor I in 1980, died at age 87 on August 7, 2009. He retired from BNL on June 30, 1984.

LSST Book from pg. 1

...latest developments in astronomy and astrophysics relevant to the LSST Science Collaborations.

Immensity of Data To Be Mined

"One of the unusual aspects of the LSST is the number of particle physicists participating in the project," said Sivertz. "In its scope and size, the project rivals accelerators like the Relativistic Heavy Ion Collider [RHIC]. The staggeringly large data volume is comparable to that dealt with by the STAR and PHENIX detectors in analysis of the RHIC data. Astronomers are making use of tools like large-scale simulations that have been commonplace in particle physics for decades. Particle physicists are finding no more effective way of studying the elusive dark matter and dark energy than by looking through a telescope."

Sivertz explained that the *LSST Science Book* contains 11 chapters on topics ranging from cataloging the potentially harmful near-Earth asteroids to using gravitational lensing to map out the distribution of dark matter across the universe.

"Each night of observing, the LSST will discover hundreds of supernovae, a sample comparable to the total number of supernova known to date. The catalog of over 3 billion galaxies will enable studies of the equation of state of the universe, casting light on the nature of dark energy," he said.

Other chapters describe how the demands of the science constrain the design of the telescope itself, from the mirror sizes to the choice of sensor used for the camera.

Throughout the book, and in a chapter dedicated to public outreach, projects that involve public participation are described, similar to the popular Galaxy Zoo project (<http://www.GalaxyZoo.org>) on the web that encourages hundreds of thousands of volunteer amateurs to classify galaxies and more recently to find supernovae.

LSST is scheduled for "first light" in 2014, with science operations beginning in 2015. Said Sivertz, "The *LSST Science Book* will serve as a guidepost during the design and construction phase and continue to be a useful reference throughout the ten-year life of the project."



Photos by Michael Herbert

Meet Manuel Miranda...And Jim Stolfi

Manuel Miranda joined BNL as an assistant scientist on June 22, 2009, and now, after settling in to his new responsibilities, he is very happy with his decision to join a team of “high-caliber colleagues” in the Energy Sciences & Technology Department’s Engineering Mechanics and Infrastructure Group.

After he earned his Ph.D. from Columbia University, Miranda was interested in working in a research environment. Also, he and his wife, who recently became new parents, wanted to stay in the Northeast. BNL was an excellent fit for him.

In his new position at BNL, Miranda reviews the safety of designs for proposed new nuclear power plants. Currently, he is reviewing design safety for the Evolutionary Power Reactor, a pressurized water reactor that is the latest generation nuclear power plant design, to make sure that it meets all Nuclear Regulatory Commission (NRC) regulations.

“The big challenge of my job right now is to get up to speed on learning NRC regulations,” said Miranda.

According to Miranda, the best part of his new job is his team of colleagues, very knowledgeable professionals who readily share their expertise with him. He also enjoys the “laid-back, campus environment” at BNL.

Born and raised in Peru, Miranda earned a diploma in



Roger Stoulenburgh DT121009

civil engineering from Pontificia Universidad Católica del Perú in 1998. He then came to the U.S. and worked as a research assistant at Stanford University in 1999, and earned his M.S. in structural engineering from the university in 2000.

Miranda then became an engineer at ABS Consulting, Inc., in Oakland, California, in 2000, but left the company in 2004 to earn a Ph.D. in engineering mechanics from Columbia University. During that time he worked as a research assistant at Columbia, and, for several months in 2008, as a project director at Thornton Tomasetti, Inc., in Manhattan, but left that firm to complete his Ph.D. thesis. He earned his doctoral degree in 2009, and shortly afterward joined Brookhaven.

— Diane Greenberg

Jim Stolfi first came to BNL in the late 1990s as a mechanical inspector in the Magnet Division during the assembly of the Relativistic Heavy Ion Collider (RHIC). Now, he has returned to aid in the construction and operation of Brookhaven’s newest premier facility, the National Synchrotron Light Source II (NSLS-II).

Stolfi was born in Rome, Italy, as his father’s work building power plants for GE took him across many countries. He grew up in Center Moriches, and has lived there ever since. When Stolfi’s previous employer, Northrop Grumman, relocated off Long Island, he began seeking employment in technical and manufacturing fields.

“I first learned of the high-tech positions that the Laboratory had to offer when I was attending night college,” Stolfi said. “Many of the students in my technical class were BNL employees and spoke of the interesting projects and great work atmosphere.”

Stolfi joined Brookhaven in April 1996. He was responsible for the receipt, inspection, and inventory control of detailed parts that would eventually find their way into magnets both at RHIC and at the Large Hadron Collider in Switzerland.

Once Stolfi’s first position at Brookhaven ended, he helped manufacture specialized x-ray and computed axial tomography (CAT) scan hardware. He has since returned to the Lab as a technical specialist working on vacuum components for NSLS-II. Stolfi intends to



Roger Stoulenburgh DT1061009

continue at Brookhaven for the remainder of his career, and will stay on as a vacuum support technician once NSLS-II construction is complete.

“I returned to Brookhaven Lab because I wanted to re-join the highly skilled team of scientists, engineers, and technicians who will be designing and building the NSLS-II machine,” he said.

When asked what he liked most about working at Brookhaven, Stolfi answered that it was being part of the interesting work the Lab performs, which continues to challenge his skills and encourages teamwork. He was especially excited to take part in the groundbreaking ceremony for NSLS-II with the old BNL team.

In his spare time, Stolfi applies his expert skills to repairing old automobiles; he now has a fully restored ’79 Camaro and ’72 Corvette. He attends local car shows and enjoys “taking rides out east.”

— Steven Deitz

TIAA-CREF One-on-One Retirement Counseling

To answer employees’ questions about their financial matters, a TIAA-CREF consultant will visit BNL in November, on Wednesday and Thursday, 4 and 5; Wednesday, 18; Thursday, 19; and Tuesday, 24; and, in December, on Friday, 4; Monday, 7; Wednesday, 9; Thursday, 10; Monday, 14 and Tuesday, 15.

The consultant will help you: understand the importance of protecting your assets against inflation, find the right allocation mix, learn about TIAA-CREF retirement income flexibility, and compare lifetime income vs. cash withdrawal options. For an appointment, call 1-800-732-8353.

Defensive Driving Course: Two Parts, 11/16 & 19

The next six-hour Defensive Driving (Point & Insurance Reduction) course will be held in two parts on Monday and Thursday: November 16 and 19, in the Brookhaven Center South Room, 6–9:15 p.m. The course is open to BNL, BSA, and DOE employees, facility-users, and their families. The cost is \$38 per person. Preregistration is required. To register, call Ed Sierra, 821-1013, and leave a message. Or take a New York DMV approved course (Use code: “SAVE10” for \$10 discount) online: <http://www.lidriveSAFE.com/>.

‘A Band Called Sam’ 11/14

A Band Called Sam, a band carrying on the legacy of the late Sam “Bluzman” Taylor, will perform on Saturday, 11/14, at 8 p.m. in Berkner Hall. Sponsored by the BNL Music Club, the event is open to the public. All visitors to the Laboratory of 16 and older must bring a photo I.D.

Taylor, a well-known blues singer and songwriter, died in 2009 at the age of 74. He originally hailed from Tucson, Arizona, but called Long Island home for the last ten years of his life, performing in venues around Long Island and the Big Apple. Taylor, who frequently sported his signature sailor’s cap, performed with legendary musicians such as Otis Redding, T-Bone Walker, Little Johnny Taylor and Big Joe Turner.

Members of the band include Sandra Taylor and LAW, the daughter and grandson of Sam Taylor, and long-time Sam Taylor bandmates Mario Staiano on drums, “FL” on keys, Gary Grob on bass, together with Bobby Nathan on guitar, and Big Al on saxophone. To honor the legendary Sam Taylor, the band performs



Joseph Rubino AD010702

The late Sam “Bluzman” Taylor

the songs and sounds of this profoundly moving blues artist.

Tickets for the show are \$15 in advance and \$20 the day of the show. Tickets may be purchased at the BERA Store in Berkner Hall, weekdays 9 a.m.-3 p.m.; through www.ticketweb.com; or at the door. For more information call 631 344-3846.

Watch a video of the band performing “My Name is Sam” at the 2009 Riverhead Blues Festival, www.youtube.com/watch?v=UdT2zLSqHu8.

— Jane Koropsak

BSA Noon Recital: SB Opera, 11/18

Stony Brook Opera will present excerpts from their *Fall Opera Scenes* production on Wednesday, November 18, at noon in Berkner Hall. Sponsored by Brookhaven Science Associates, the event is free and open to the public. All visitors to the Lab of 16 and older must bring a photo I.D.

Comprised of operas in English by Igor Stravinsky and Benjamin Britten, the musically diverse program is centered on semi-staged scenes from Stravinsky’s masterpiece, *The Rake’s Progress* — a modern re-telling of the Faust story. Also represented on the program are Britten’s operas *The Turn of the Screw* and *The Rape of Lucretia*. Music direction is by Stony Brook faculty member and nationally recognized conductor Timothy Long.

Ads from pg. 4 (Real Estate Rental cont.)
EAST SETAUKE – 1 bd/rm, full kit/bath, tv rm, bsmt apt, own ent, water/elec incl, no smkg/pets, new paint/rugs, 20 min to BNL, off Rt. 47. \$800. John, 813-0910.
SHIRLEY – lg 1 bdrm bsmt apt, suitable for one, roomy/bright, all util incl, no smkg/pets. \$675/mo. Ext. 3846.
SHIRLEY – rm, furn, sep ent, full bath, kitnet/heat/elect/cable/wless Int, 1 mo sec, 5min to stores/beach/8min to Lab, no major hwy, no smkg/pets. \$650/mo. 804-8609.
SHOREHAM – brand new, bright studio apt. for one, sep ent, hi spd cable, all utils incl., quiet area, mins. to Lab, no smoking/pets please. \$650/mo. 375-8816.
SHOREHAM – 4-br/2-bath house, full bsmt, w/d, closets, 1 car gar, lg. backyd w/patio, hdwd flrs, new carpeting upstrs, fresh paint, SWRS, \$1,950/mo.+ util/sec. 678-7602.
For Sale
E. YAPHANK – 3 bdrm, 3 bath, oversize garage. 1/2 acre. Newly redone & landscaped. CAC, FP, income producing potential. Nr Lab. \$329,990 neg. 516-383-7006.

CALENDAR

Friday, 10/30

Body & Soul Biathlon 800-yd Swim
11 a.m.-1:30 p.m. Swimming pool. Bldg. 472. Organized by BERA Swim Club. Part of split biathlon or just for great workout. Register at www.bnl.gov/bera/activities/swimming/.

— WEEK OF 11/2 —

Wednesday, 11/4

Hampton Inn Brookhaven Vendor Day
11 a.m.-2 p.m. Berkner Hall lobby. Representatives will talk about rates at Hampton Inn and explain a new “BNL Shuttle,” Mon.-Fri., 8 a.m. and 5 p.m. And, win a raffle for a Hampton Cloud Nine Bedding Set. More information at www.longisland-brookhaven.hamptoninn.com.

Reimbursement Accounts Seminar
Noon-1 p.m. Berkner Hall. As part of the Benefits Open Enrollment period, learn more about reimbursement accounts to save money on health care, dependent day care, and transit commuter expenses. All employees are welcome. See also <http://intranet.bnl.gov/memo/mm.asp?IssueId=157&StoryId=4>.

Thursday, 11/5

Health Insurance Vendors
11 a.m.-2 p.m. Bldg. 400 lobby. Medical and dental companies will have representatives to explain options to be chosen during BNL’s Benefits Open Enrollment period, which continues through November 10.

Saturday, 11/7

Celebrate Diwali, Festival of Lights
3 p.m. Berkner Hall. The BERA Indo-American Association will hold Diwali to showcase the culture of India through music, dance, and the arts. Indian snacks and an Indian dinner after the show will be served. Adults, \$15; and children under 12, \$9. After 10/31, adults/\$17, children/\$10. To reserve and pay through PayPal go to www.bnl.gov/bera/activities/iaa/diwali2009. Tickets are refundable until 11/4. Visitors to the Lab of 16 and over must bring a current photo.

— WEEK OF 11/9 —

Wednesday, 11/11

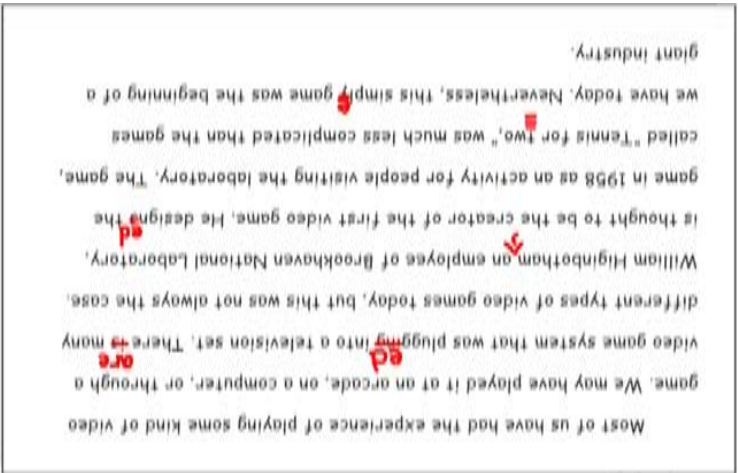
Veterans’ Day, Lab Holiday
The Lab will close in honor of Veterans’ Day. No Bulletin will be issued on Friday, 11/13.
Especially now that the holiday season is starting, please remember to donate to the BNL Food Drive. Every can helps. Neighbors are hungry.

it best: “This program is just one of the many benefits offered by BNL. It feels good knowing your employer really cares about you, not just at work, but also at home. For me, working at the Lab is like celebrating a holiday every day.”

For more information on the Lab’s Housing Assistance Program, contact Ernie Tucker, Ext. 5735, tucker@bnl.gov or Liz Gilbert, Ext. 2315, gilbert@bnl.gov.

For more information on the Long Island Housing Partnership go to: www.lihp.org.

— Jane Koropsak



Test Answers from pg. 4

Classified Advertisements

Placement Notices

To apply for a position, go to www.bnl.gov. Select "Job Opportunities," then "Search Job List."

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

ASSISTANT CONTRACT SPECIALIST (A-4)- Requires a bachelor's degree in business administration, or eight years of relevant experience that provides evidence of the abilities necessary to perform the duties of the position. This must include two years of experience at BNL. Requires excellent oral and written communication skills and the ability to interact professionally with contractors, requestors and other Laboratory personnel. Must have comprehensive experience in Microsoft Word and Excel and knowledge of PeopleSoft financials. Credit card holder experience in purchasing of goods and materials, reconciliation of monthly statements, and verifying that all transactions are made in accordance with BNL policy is required. Experience in a procurement environment and knowledge of procurement policies and procedures is preferred. Previous experience working with the government Federal Acquisition Regulation (FAR) and the Department of Energy Acquisition Regulations (DEAR) requirements is also preferred. Under general supervision, will be responsible for the contracts administration assigned, including invoice approval, update and maintenance of files, and correspondence. Duties include obtaining services or goods through contractual agreements and purchase orders in accordance with the standard methods and procedures within Procurement and Laboratory policies and programs. Will be required to adhere to FAR and DEAR requirements. Will update and maintain the associated PeopleSoft purchase order information as required. Procurement & Property Management Division. Apply for Job ID #15078.

OPEN RECRUITMENT - Opportunities for Lab employees and outside candidates.

ASSOCIATE LABORATORY DIRECTOR, ENVIRONMENT & LIFE SCIENCES Brookhaven National Laboratory (BNL) seeks an Associate Laboratory Director (ALD) to provide leadership of a newly created directorate that includes the Environmental Sciences, Biology and Medical Departments with a combined staff of 225. The ALD reports to the Laboratory Director. The Laboratory is especially interested in developing programs that link its existing world-class research on the response of ecosystems to rising CO₂ concentrations to its climate-change related molecular biology research, and to its analysis and modeling capabilities. Important related assets include BNL's synchrotron, nano-science and computing capabilities in addition to its nearness to Stony Brook University (SUNY), which enables close collaboration and joint appointments. Qualifications include an advanced degree and a distinguished research career in environmental, climate or biological science, and experience managing a large research program in a federally funded environment. Demonstrated ability to work with multiple sponsors at the federal and state level, as well as private industry, is highly desirable, as is experience with international organizations. Responsibilities include developing internationally recognized programs that are aligned with the mission of the Department of Energy; participating in lab-wide planning for Laboratory initiatives in energy and environmental sciences; linking directorate research and taking advantage of BNL's unique facilities; maintaining and enhancing excellence and productivity; developing outreach to universities and supporting collaborations between industrial partnerships and end users. The ALD is also responsible for operational and environmental performance, including safety. Apply for Job #15077.

ASSISTANT PHYSICIST (Nuclear or High-Energy Physics) - Requires a Ph.D. nuclear or high-energy physics with experience in lattice gauge theory and numerical analysis. Previous work in finite temperature QCD is highly desirable. This position is with the Lattice Gauge Theory Group. Appointments will be made initially for two years. Expected to contribute to the research of the group on topics in lattice-regularized field theory. After electronic submission of application, please arrange to have three letters of recommendation sent to aaponte@bnl.gov (preferred) or mail to: A. Aponte, Physics Department, Building 510, BNL, Upton, NY 11973-5000, USA. Review of applications will begin from January 2010 and will continue until the position is filled. Under the direction of F. Karsch, Physics Department. Apply for Job ID #15082.

***POSTDOCTORAL RESEARCH ASSOCIATE** (Nuclear Spectroscopy) - Requires a Ph.D. in nuclear engineering, physics, or related field, in which candidate gained experience in nuclear spectroscopy and instrumentation. Is expected to interact closely with soil scientists from other universities and agencies across the United States and is expected to have a working knowledge of Monte Carlo simulations with the MCNP5 code. Will be required to develop, characterize, and deploy a non-destructive system for elemental prompt gamma soil analysis in

the field, combined with Monte Carlo simulations of the system. Frequent trips over US for field studies will also be required. Will be involved in and assume responsibility at all stages of the project; design, testing and deployment of an INS system for soil analysis. This will entail a multidisciplinary research engaged in soil analysis research at BNL under the direction of L. Wielopolski, Environmental Sciences Department. Apply for Job ID #15079.

***POSTDOCTORAL RESEARCH ASSOCIATE** (Theoretical Physics) - Requires a Ph.D. in theoretical physics. Will participate in research program examining strongly correlated electron systems using a numerical approach recently developed by the condensed matter theory group at BNL. Position expected to start in the summer or fall of 2010. Preference will be given to applicants with expertise in quantum field theoretic aspects of low dimensional condensed matter theory together with a familiarity with or willingness to employ numerical approaches. When electronically applying for this position, please include (in one document) your CV, publication list, and research statement. After electronic submission of application, arrange to have three letters or recommendation and select preprints sent electronically (PDF format) to elevine@bnl.gov. Hard copies (recommendation letters and preprints) may be mailed to Condensed Matter Theory Postdoctoral Search, c/o E. Levine, CMPMS Dept., Bldg. 510A, BNL, Upton, NY 11973-5000. Applications must be received by December 15, 2009. Under the direction of R. Konik, Condensed Matter Physics & Materials Science Department. Apply for Job ID #15081.

***POSTDOCTORAL RESEARCH ASSOCIATE** (Theoretical Elementary Particle Physics) - Requires a Ph.D. in theoretical elementary particle physics. The High Energy Theory Group expects to have a postdoctoral position available beginning October 1, 2010. The group has active programs in all areas of particle physics, including Standard Model and beyond and lattice gauge techniques. After electronic submission of application, please arrange to have three letters of recommendation sent to aaponte@bnl.gov (preferred) or mail to: A. Aponte, Physics Department, Bldg. 510, BNL, Upton, NY 11973-5000, USA. Applications will be reviewed starting December 1 and the application deadline is Dec. 15, 2009. Under the direction of A. Soni, Physics Department. Apply for Job ID #15083.

***POSTDOCTORAL RESEARCH ASSOCIATE** (Biochemical Phenotyping) - Requires a Ph.D. in biology, preferably plant biology, and a publication record in international journals. Experience in the following areas is desirable: biochemistry, computer programming, robotics, genetics, systems biology, and statistical analysis of large and complex data sets. Will work on the development of assays for parameters associated with yield and CO₂ responsiveness, automate these assays using liquid handling robots and evaluate the analytical platform using plant material grown at current and elevated CO₂ concentration. The goal is to develop a platform for high throughput phenotyping that can be used to aid the identification of CO₂ responsive germplasm in potential large scale screening programs (e.g. Ainsworth et al./2008 *Plant, Cell & Environment* 31, 1317-1324). When applying for this position, please include (in one document) a CV, cover letter detailing research interests and the names and email addresses of at least three references. The position is available to start in late 2009 or early 2010. For more information see <http://www.bnl.gov/pubweb/alistairrogers/> or contact Dr. Alistair Rogers at arogers@bnl.gov. Under the direction of A. Rogers, Environmental Sciences Department. Apply for Job ID #15080.

***POSTDOCTORAL RESEARCH ASSOCIATE** (Experimental High Energy or Nuclear Physics) - Requires a Ph.D. in experimental high energy or nuclear physics. Expected to play an important role in the development of a Laboratory directed R&D program on Noble Liquid Drift Detectors for possible future neutrino experiments. The goal of the program is to advance significantly Noble Liquid detector technology in terms of scalability to very large volumes. All aspects of the technology will be a subject of this research, such as fundamental transport properties of the active medium, cryogenics, purification, detector configuration, readout and trigger. In addition, BNL is also developing Liquid Argon TPC's for the MicroBooNE experiment at FNAL, and a future large Liquid Argon TPC for a long baseline neutrino experiment at the Deep Underground Science and Engineering Laboratory (DUSEL). Associated with these detector R&D programs is a rich physics program in the intensity frontier of high-energy physics. Under the direction of H. Ma and F. Lanni, Physics Department. Apply for Job ID #15085.

***NOTE:** BNL policy states that Research Associate appointments may be made to those who have received their doctoral degrees within the past five years.

Motor Vehicles & Supplies

06 CHEVY 2500HD - 35K mi. crewcab Silverado loaded s/roof, lthr, p/w, mtchng cap sprayd bd liner, cust whls, new tires, ext wrr 6yr/75000. \$25,500 neg. 375-3313.

06 TOYOTA SIENNA - 59K mi. orig owner, well maint, excel cond, loaded w/extras, must sell. 806-1410.

05 INFINITI G35 6MT COUPE - 20.8K mi. silver coupe outstndg cond, low mi w/s/roof, rear spoiler, manual 6/spd trany. \$22,500. Ext. 2525, 331-6288.

04 TOYOTA SOLARA - 32K mi. 3.3 ltr V6, a/t, loaded, m/roof, lthr, clim contr, htd seats, 5 disc CD, rem str, gar, like new, kbb val \$14,160, ask. \$13,200. Ext. 7294, 839-5831.

03 DODGE NEON - 79K mi. 4cyl., 2L, 4spd., a/t, a/c, am/fm, p/b, p/s, excel. cond., non-smkr. \$4,490. Ext. 4924, smonchy@bnl.gov.

03 HYUNDAI SONATA GLS - 96K mi. wht. ext/ beige int, V6 a/t, many new parts, runs excel, v/gd cond, \$4,995 neg. Ext. 5423, 645-4769.

89 HONDA GOLDWING - 25K mi. AM/FM cass, l/com syst, CB radio, Motorcycle fully loaded. Grt running machine. \$4,500. 772-7007.

87 BMW 635CSI - 195K mi. 2dr Coupe "Cinnabar Red," l-6 w/a 5spd mnuat, no accidts! well-maint'd, little rust. \$3,000 neg. John, Ext. 2022, 926-5516, jpomaro@bnl.gov.

AUTO ACCESSORIES - Billet Grille for 03/04 Nissan Altimas, gd cond, \$25; new 1 1/4 Amer. flag hitch cover/\$10; strn/steel 1 1/4 hitch lock/\$10. David, Ext. 5201.

SKI RACKS - Barrecreafter, 20"w, \$10/set. Ext. 7505.

WHEELS/TIRES/HUBCAPS - '08 Civic OEM, <100mi. Ext. 4994, jadams@bnl.gov.

Boats & Marine Supplies

38' CHRIS CRAFT COMMANDER - f/gl thick, beaut. heavy stable boat, twin fresh-wtr cooled engs & gen, radar, 2 refrigs, m/wve, bmni. \$10,900 neg. 386-492-3953.

MOORING - used 250" mushroom mooring anchor/\$200. Ext. 2788.

SAILBOAT JACK STANDS - Brownell, flat top model SB-3FL, 36"h - 54"h, 4 used stands, \$250. Ext. 2788.

Furnishings & Appliances

BUTCHER BLOCK - 24"x24" shelf & drawer below, cutting top 6' thick, on casters, may be used as small center island, \$300. Ext. 4453 or meinken@bnl.gov.

CHILD BUNK/DESK BED - All wood bunk-bed w/latter, desk underneath, pull out bed, storage behind desk, \$250. Ron, 379-0742 or rrje4019@msn.com.

COFFEE TABLE - excel cond, wood/glass, <http://newyork.craigslist.org/lgl/fuo/1437967196.html> email tcutrone@bnl.gov if problem with link. Ext. 2051.

CRIB - w/white mattress, \$125; high chair, \$30; pack & play, \$30; both items Graco. Annamarie, 821-5247.

HUTCH - Light oak hutch w/glass drs, excel. cond. ask/\$250/obo, pics avail. . Wendy, Ext. 3924 or wwilliams@bnl.gov.

MATTRESS - Sterns & Foster Q/size double pillowtop, guest rm use only, excel cond, ask/\$300. Charles McCabe, 872-2788 or docuteck@hotmail.com.

PATIO FURNITURE - 1 lg table, 1 sm table, 6 chrs, 2 ottomans, great cond, details, <http://www.rpmovingsale.blogspot.com/> . Jo, Ext. 5068 or jlonien@bnl.gov.

TABLE, PEDESTAL - Ashley, oak, tile eating surface, 42" round, no chairs, pic avail, ask/\$35. Mike, 790-6374.

TABLES - 4pc living room tables w/glass top & wrought iron below. Excel. cond. \$150/obo. Ext. 3924, wwilliams@bnl.gov.

TOT/TEEN PLATFORM BED - twin Formica, bisque, 2 drawers, like new, magnum2@op-tonline.net for pics, ask/\$75. 331-8763.

Audio, Video & Computers

CRATE PA-6 POWERED MIXER - 600W 150W @ 4 ohms. w/reverb 2 community PA spkrs 12", grt cond, works well, \$175/neg, Ext. 5219, 659-3507.

PHOTO & NEGATIVE SCANNING - www.pictureperfectscans.com scans & color corrects 35mm slides, more, 928-6469.

PROFESSIONAL MIDI SAMPLER - Yamaha A3000 w/digital I/O, extra outputs, extra memory and SCSI options installed, great cond, manual incl \$150. Ext. 3621.

WIRELESS ROUTER - Netgear WGR614, 4 mo old, \$20; 900 MHz phones, phone cords, TV co-axial cables, splitters, computer mouse, etc. Ext. 7505.

Sports, Hobbies & Pets

EXERCISE MACHINE - Nordictrack Pro, pics avail, \$50/obo. Ext. 7505.

FISH TANK - 10 Gall rectangr, w/black trim, \$5. Paul, Ext. 2899 or porfin@bnl.gov.

Tools, House & Garden

CRAFTSMAN TOOLS - 1950s, 10" radial arm saw w/tble/100; 10" tbl saw w/36" tble on stdnd/\$75; 18" jig saw/\$50; hd router/\$50; antique blow torch/\$35. Ext. 7114.

HYDRAULIC PORTA-POWER 4 TON - hentral hydraulic, \$75, 8/jack stands/\$5/ea, sm metal lathe \$25; parts washer 5 gals/\$75. Peter, Ext. 3981, 872-8963.

SNOW THROWER - Troy Built 8.5 HP, 4 cyl Dual Auger Brand, used once, \$695 . Ron, 379-0742 or rrje4019@msn.com.

Miscellaneous

BATHROOM SINK - Kohler, white, toilet/tank, like new, \$75; men's car coat, size 42, Poplin Alpaca Lining/\$35. 928-5185.

FIREPLACE LOG HOLDER - basket-looking style, brand new in package, brass, photo avail, \$20. Kathleen, Ext. 7114.

Are You Smarter Than A Seventh Grader?

Earlier this year, seventh graders across New York were introduced to Brookhaven National Laboratory during part of an annual, statewide English/Language Arts test. Students were instructed to read a paragraph and then correct the mistakes they found. This year, the paragraph was about Brookhaven Lab employee William Higinbotham, who, 51 years ago this month, invented what is believed to be the first video game ever, Tennis for Two.

Lori Lebel, a seventh- and eighth-grade English teacher at Central Park International Magnet School in the Schenectady City School District, was surprised to see Brookhaven Lab mentioned in the test. As a high school student, she interned at the Lab and her father, Carl Czajkowski, still works in the Lab's Nonproliferation and National Security Department.

"These tests rarely relate to something in students' lives," Lebel said. "The kids were so excited when I told them that I actually had a connection to something that was in the test."

So, now for the test. The answers can be found on pg. 3.

Here is a paragraph a student wrote. There are some mistakes in the paragraph. Some sentences may have more than one mistake, and other sentences may contain no mistakes at all. There are no mistakes in spelling.

Read the paragraph and find the mistakes. Draw a line through each mistake in the paragraph. Then write the correction above it.

Most of us have had the experience of playing some kind of video game. We may have played it at an arcade, on a computer, or through a video game system that was plugging into a television set. There is many different types of video games today, but this was not always the case. William Higinbotham an employee of Brookhaven National Laboratory, is thought to be the creator of the first video game. He designs the game in 1958 as an activity for people visiting the laboratory. The game, called "Tennis for two," was much less complicated than the games we have today. Nevertheless, this simply game was the beginning of a giant industry.

FISHER PRICE TOYS - Sing & Story Lrning Chr \$20, Little Star Sing-Along Stage \$35, Bounce & Spin Zebra \$30. All neg. or \$70/ all. Ext. 3924 or wwilliams@bnl.gov.

ISAGENIX - Isa Snacks orig/\$21, sell/\$10; Isa Flush/\$8, all sealed, approx. 5 of ea kind. 645-1349.

MOBILITY SCOOTER - 3 wheels movable seat /arms, re-chargebl batt., horm front lights, make offer. Ext. 4453, meinken@bnl.gov.

QUAD-2007 YAMAHA RAPTOR - Model 700R, 5 spd, low hrs, excel cond, ask/\$5500. Rich, Ext. 4520 or doulous@bnl.gov.

RATDOG TICKETS - Beacon Theatre, 10/24, four tickets, \$202/pr. Steve, Ext. 4211, 286-3681.

TIRES - 4 Cooper Lifeline, 185/60R14 mounted on Toyota rims, less than 1,500 mi, \$380/obo. Lou, 732-1028.

Yard & Garage Sales

WADING RIVER - Sat, Oct 31 and Sun, Nov 1, 30 Barnes Road. Ext. 4432.

Community Involvement

SAVE A PET - donations needed, blankets, dry dog/cat food, \$\$\$, 473-6333, thank you. Hugh, Ext. 2031 or hrhodus@bnl.gov.

Happenings

NFCT PRESENTS "RABBIT HOLE" - Pulitzer prize winning drama, N. Fork Community Theatre, Mattituck, Fri, Sat, Sun, 11/6-11/22, tickets/\$15, <http://www.nfct.com> or 298-NFCT. Laura, Ext. 2520.

RUSSIAN BARD'S CONCERT - Tatiana & Sergey Nikitin, 10/31, 6pm, SB Univ, Student Union Auditorium, free prkg @ SBU Stadium, admission/\$20. Andrey Sukhanov, Ext. 7119.

SCUBA/SNORKEL CLUB MEETING - The BNL Sc/Sn Club will meet 11/9, Berkner Rm C, noon - 1. Club open to both beginners & experienced divers. Deborah, Ext. 5664 or bauer@bnl.gov.

Farewell Gathering

RALPH GARAPPOLO - POST OFFICE - Farewell! come by the PO for coffee & cookies, 10/30, 11am-1pm!. Ext. 5090.

Free

CURIO HUTCH - Black lamin., glass frt, dr, & shelves, lighted, 16"d x36"wx78"h, excel cond. Ext. 4520, doulous@bnl.gov.

PERENNIALS - 7 extra lg hardy Hostas, split to make many, evergrn grnd covers, U-dig & pic up, Mastic. Joyce, Ext. 4215.

PLYWOOD SHEATHING - 5 sheets, 4'x4'x15/32", never used. Shigeki, Ext. 2635 or misawa@bnl.gov.

TRAMPOLINE - lg circular outdr variety, no side curtains, already disassembled and ready for pick up. Ext. 2788.

TV - working, not cable ready, about 20" screen. Ext. 4453 or meinken@bnl.gov.

Wanted

27" TV - or larger, great working cond w/remote at reasonable price. Susan, Ext. 3801, 821-0767, or slattuca@bnl.gov.

CALCULUS TUTOR - Tutor needed for 2nd-yr coll. student in calculus. 921-1413.

GRAPHING CALCULATOR - Texas Instrumnt TI-83 or TI-84 for high school student, gd cond. Ext. 4961 or pichs@bnl.gov.

LAWN MOWER - used, w/bag. Ext. 7277.

NEW/GENTLY USED ITEMS OR MONEY DONATIONS - to be donated to 76 families in one shelter alone, and possibly other shelters. NEEDED: women's & men's clothing, to Kathleen, Ext. 3161, kratto@bnl.gov; childrens clothes from tots-to-teens, Laura, Ext. 4027, 457-3759 or lbuscemi@bnl.gov; and toys and books to Karen, Ext. 2449 or kpaukner@bnl.gov. Thank you so much.

PLAYSTATION 3 GAMES - buy used games for the PS3. Ext. 3161 or kratto@bnl.gov.

Lost & Found

LOST KEYS - 6 on ring w/clip in prkg lot of bldg 815 west side. Richard, 516-779-3116 or riagattolla@bnl.gov.

For Rent

NAPLES, FL - 2br/2ba completely furn condo in gated golf comm, seasonal rate for Jan/Feb or Mar. \$2,600/mo. 523-7870.

E. PATCHOGUE - 3/br hse, furn, l/r, d/r, eik, 2full ba, 2car gar, dac/back yd, cust kit, fully equip, hi spd cable/int, nr stores/LIRR/bus, walk to water. \$2,850/mo. 484-885-8867.

EAST SETAUKET - 1/bdrm furn, bsmt, sep ent, all util. incl + wireless netwk, no smkg/pets ideal for single person, no deposit. \$175/wk neg. Ext. 7496, 828-8509.

MASTIC - One bdrm apt for rent. All included. \$1,000/mo. Ken, 772-7007.

MILLER PLACE - fully furn. Col. hse in prof. resid. area, int/tv, ac/heat, full kit, own bdrm. 8 mi to BNL, all incl, moved in ready, responsible non-smoker. \$675/mo. 744-8386.

MILLER PLACE - 1/bdrm furn, bsmt, l/r, d/r, w/d, d/w, fpl, neat clean yd, off st prkg, no smkg/pets. \$1,425/mo. 473-3349.

PORT JEFF VILLAGE - furn, 2bdrm, 2bath, l/r, den/dr, lg screened-n-porch, w/d, util incl, garbage, gar, priv village beach, no smkg/pets. \$1,800/mo. 928-5185.

ROCKY POINT - 1 br upper unit, kit, bath, l/r, balcy, quiet co-op comm, nr stores, Indry rm on prem, prkg spot, no smkg/pets, cac, incl gas/water. \$1,150/mo. 806-5965.

RONKONKOMA - 3 bdrm hse, unfn bsmt, w/d, gar, lg fen yd, nice neighborhood, Connetquot schools, no smkg. \$1,895/mo. Joe, 834-3461.

SHIRLEY - 1 bdrm apt grnd flr, furn, quiet area, pvt ent/yd, util incl, walk to stores, 5 mi to lab. \$800/mo. Ganga, Ext. 3849.

See Ads on pg. 3