

## Biologists Describe 'Molecular Sled' — New Mechanism for Molecular Interactions

**'Molecular sled' carries viral enzyme along DNA to find, interact with targets; findings suggest mechanism may be universal**

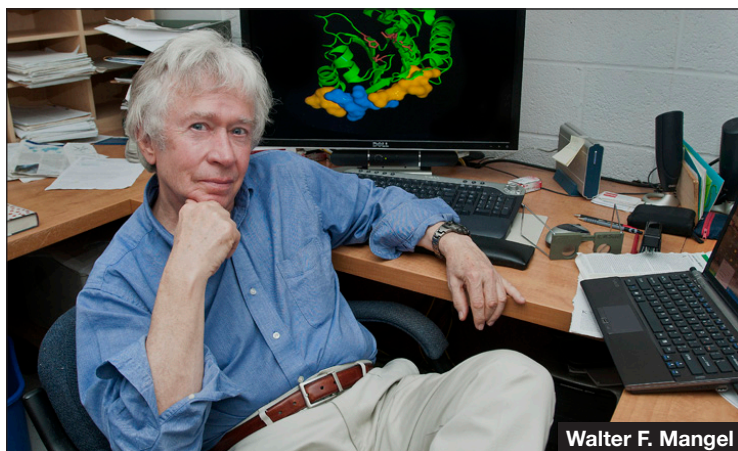
Scientists at BNL, with collaborators from Harvard University, the University of Madrid, Princeton University, and the University of Zurich, have discovered a new mechanism that may alter principle understandings of molecular interactions within a cell's nucleus. The discovery illustrates how two proteins of the human adenovirus use DNA as an efficient form of transportation inside a newly synthesized virus particle.

The proteins use what the scientists are calling a "molecular sled," which slides along the DNA double helix — much like a train running along its tracks — to find and interact with other proteins. In a series of four papers published back to back online October 7, 2012, in the *Journal of Biological Chemistry* under the title "Regulation of a viral proteinase by a peptide and DNA in one-dimensional space," the group, led by BNL biophysicist Walter F. Mangel, has raised the possibility that all proteins in the nuclei of cells interact by sliding on DNA in this fashion.

### Continuation of Previous Research

The papers are a continuation of research by Mangel and his various collaborators that explores how a protease (an enzyme that cleaves other proteins) is involved in the replication of adenoviruses. The adenovirus protease shares common features found in the proteases of many other viruses, such as HIV, and some bacteria, such as *Chlamydia*. This makes the results from studying adenovirus — whose different types cause a wide variety of diseases from common colds, to pink eye, blindness, weight gain, and diarrhea — highly applicable to different areas of human health. Ultimately, the Mangel group plans to use what they learn to develop new antiviral and antibacterial agents.

At the time Mangel's group began working on the adenovirus, it was known that its protease is responsible for the final stage of virus development. "The last step in formation of an infectious adenovirus particle is the activation of the protease and its cleavage — or cutting out — of some of the proteins used to assemble the virus particle," Mangel explained. Much in the same fashion that gothic cathedrals were built around a wooden frame, adenovirus uses "construction" proteins to build its frame. When a cathedral is nearly finished, the internal scaffolding is removed, leaving a fully functional build-



Walter F. Mangel

ing. Similarly, as shown in these papers, the adenovirus protease navigates the viral DNA in the new virus particle, cutting out the "construction" proteins.

In the early 1990s, the Mangel group observed the viral protease interacting with DNA, which surprised them because proteases had never before been known to interact with DNA. Subsequent research characterized the binding of the protease to DNA. But, the group still did not know why the protease bound to DNA. In these four back-to-back papers, they finally describe the process in detail and postulate an explanation.

### Pathway to Discovery

To elucidate the process, Mangel and his group placed a purified protease and one of the adenovirus proteins it cleaves in a test tube. Surprisingly, they did not interact — no cleavage occurred. Thinking this indicated that more than these two components are required for cleavage to take place, they mixed in disrupted virus particles with the two purified proteins. This resulted in the protein being cleaved. But when they purified the co-factor — the substance in the virus particle whose presence is essential for the protease's cleaving activity — they found out it was the virus' own DNA.

"That was a complete surprise," said Mangel. "Even more puzzling, we found out that the two proteins both needed to be on the same DNA molecule in order to interact," he added. "What was happening?" The simplest, but unprecedented, interpretation of these results was that the protease was sliding on the DNA to look for and cleave its proteins.

### Breakthrough

The breakthrough began when Mangel contacted Sunney Xie, a professor in the Department of Chemistry and Chemical Biology at Harvard. Mangel said he had some indirect evidence that the protease might slide on DNA, as

opposed to diffusing in any direction inside the virus particle. Xie, whose lab is famous for doing research on single biomolecules and single cells, agreed to help investigate, and Paul Blainey, a graduate student, became interested in working on the project. Brookhaven scientists Bill McGrath and Vito Graziano, who work with Mangel, labeled the protease with a fluorescent dye and Mangel took it to Cambridge to see if it would slide.

"The first day, we saw no sliding on DNA and we were so disappointed," Mangel said. He and Blainey agreed to try one last set of experiments the next morning, in a more acidic solution. As soon as the first images of single molecules of proteases and DNA appeared on the computer screen, it was clear that there was a massive amount of sliding of the enzymes along DNA, Mangel said. The group then went on to show that the protease finds its targets by sliding along DNA inside the virus particle as well, not just in test-tube experiments.

### Another Surprise

Another surprise came when the researchers started to determine what enables the protease to slide on DNA. They found that the protease alone does not slide. It must first be attached to an 11-amino acid fragment from a different adenovirus protein. Interestingly, the fragment by itself slides on DNA. Could this fragment be a "molecular sled," which can slide along the DNA "track" carrying any cargo, not just the protease?

Proof of this 11-amino-acid fragment acting as a vehicle came when Mangel's group attached other proteins to the sled, even ones that by themselves do not bind to DNA, and discovered that those slid too. The concept of a "molecular sled" is the subject of a provisional patent that was just filed with the intent that the idea can be commercialized to deliver desired cargoes (for example, healthy genes for gene therapy).

See *Molecular Sleds* on p. 3

## Infrared Absorption Boosted By Layering Sheets of Graphene

By Larry Carr, Physicist and Group Leader for Low Energy Spectroscopy, Photon Sciences Directorate

Since the discovery of graphene in 2004, research on this "wonder material" has helped measure and define its almost unbelievable properties. At just one atom thick, a single two-dimensional layer is stronger than diamond, conducts electricity better than copper, and conducts heat better than any known material. The hexagonal honeycomb lattice that makes up the material allows for extreme flexibility, but also makes for the most impermeable material ever found, shutting out even the tiniest helium atoms.

Recently, I worked with a collaboration led by Tony Heinz of Columbia University that brought a team of users to Brookhaven's National Synchrotron Light Source (NSLS) to investigate the changes that result when sheets of graphene are stacked, creating "few-layer graphene" that can either function as a semi-metal or a semi-conductor, depending on the order and thickness of the layers.

The samples we used were not only extremely thin but small in every dimension — often no bigger than the width



Larry Carr

of a human hair — making it difficult to get enough light through them to measure the absorption afterward. That's where NSLS comes in. The beamlines at NSLS offer scientists the ability to use not only x-ray spectroscopy but also cover the longer infrared wavelengths, which allowed us to probe few-layer graphene samples with infrared light. Our facility's combination of cryogenics — which keeps samples cold and eliminates thermal background noise — combined with the microscopy and high-brightness infrared beamlines... See *Graphene Sheets* on p. 2



The grant will support instrumentation that will be used at the National Synchrotron Light Source II at Brookhaven Lab.

## NSF Awards NSLS User Largest Grant For Major Research Instrumentation

Case Western Reserve University issued the following news release on October 3. The National Science Foundation grant noted in the release was awarded to Mark Chance, a longtime facility user at BNL. The grant will fund key

equipment for research at the future National Synchrotron Light Source II, now under construction and expected to begin operations in 2015.

The National Science Foundation (NSF) has awarded a \$2.7 million grant to Mark Chance, Director of the Center for Proteomics and Bioinformatics at Case Western Reserve University (CWRU) School of Medicine, for work with the National Synchrotron Light Source II (NSLS-II) at BNL. The grant will be matched by nearly \$1.2 million from the university and \$100,000 from the State of Ohio Board of Regents for a total award of \$4 million, making it the largest NSF Major Research Instrumentation (MRI) grant awarded in 2012 and the largest NSF grant awarded to CWRU since 2009.

This grant provides funding



Mark Chance

to extend the university's world-class structural biology facilities by adding a state-of-the-art instrument to the new synchrotron at BNL in New York. CWRU scientists have operated a suite of x-ray based synchrotron facilities at Brookhaven since 2005 under Chance's leadership, supported by \$8 million in grant funding from the National Institute for Biomedical Imaging & Bioengineering (NIBIB) at the National Institutes of Health.

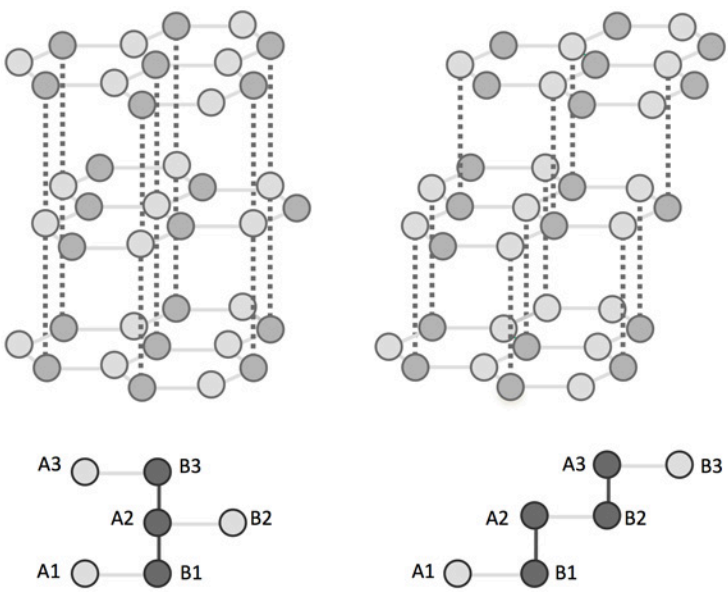
These facilities, managed by expert faculty and staff members at the Case Western Reserve Center for Proteomics and Bioinformatics (including scientists on site in New York and in Cleveland), are used to conduct groundbreaking research and develop novel technologies in structural biology. The multiple x-ray instruments available at Brookhaven support an international clientele of about 500 users from nearly 100 of the world's finest academic institutions, research institutes, and government laboratories.

See *NSF Grant* on p. 2

## BSA Distinguished Lecture • Save the Date, 11/8 'History of Topology of Spheres'

Featuring John Milnor, Professor and Co-Director of the Institute for Mathematical Sciences at Stony Brook University • Thursday, November 8 at 4 p.m. • Berkner Hall





Joshua C.H. Lui, Columbia University

**Graphene Sheets** from p. 1  
...made NSLS the perfect place to explore the nature of this chameleonic material.

We compared infrared absorption of few-layer graphene samples stacked in two ways (*see above*): a zigzag “ABA” pattern called Bernal stacking, in which matched top and bottom layers sandwich a third layer that is offset by an atom’s length; and a rhombohedral “ABC” pattern that resembles stair steps, where the top layer is shifted yet another atom’s length away from the center sheet of graphene.

This slight shift in this third layer of graphene is all it takes to make the material’s basic properties change. Rearranging the layers into an ABC stacking order drastically increases the amount of infrared light the few-layer graphene will absorb in selective wavelength ranges. It’s a bit as if you arranged Lego blocks in different patterns and found that they changed colors as a result.

This is because changes in stacking order alter the number of available states for electrons to inhabit — both when they are at rest and when they’re excited after absorbing infrared light. Phonons — mechanical vibrations of the carbon atoms forming each graphene sheet — are also affected by the stacking arrangement due to their strong connection with the electronic excitations. When the electronic absorption grows, the phonon absorption grows too.

Materials that have these strong connections, called couplings, sometimes exhibit superconductivity. Theories for the superconducting state tell us

that electrons free to move in all three dimensions can form into this special state, whereas they cannot when constrained to move strictly along a line (one dimension). Two dimensions is exactly at the boundary, which makes graphene a potentially interesting system for understanding some fundamental issues in superconductivity.

Other characteristics of graphene make it a candidate material for very high-speed electronic devices. The electrons inhabiting the hexagonal lattice of a single graphene layer have very little mass, so they can be set in motion and stopped very easily, which is just what you want in a device intended to operate at high frequencies — a cell phone, for example.

Though one sheet of graphene is a simple hexagonal network, studies like these are revealing a rich structure and new properties, which come as a result of being able to vary the properties of graphene by layering sheets of it.

Researchers at both NSLS and the Center for Functional Nanomaterials are probing the as-yet-undefined properties of graphene. The ability to leverage both of these facilities makes Brookhaven National Laboratory a prime place for discovering the next possible use of this remarkable material.

This work was completed at NSLS by scientists from Columbia University, the Spanish National Research Council, the National Research Council of Italy, Sapienza University, Case Western Reserve University, and Brookhaven National Laboratory.

**NSF Grant** from p. 1

The new instrument, a wig-gler beamline for x-ray synchrotron footprinting, will probe the fundamental structures of protein and nucleic-acid-based macromolecular machines on timescales from microseconds to minutes and will reveal intimate details of the interactions of these macromolecules with their environment.

“From the structure of water to the binding of drugs to variations in protein structure mediated by disease, the unique properties of the intense x-ray beams will uncover new details of biological matter,” Chance said. “These details will help scientists develop new materials, optimize small molecule and biological drugs, probe the structures of molecules *in vivo*, and answer fundamental questions related to chemistry and biochemistry.”

Jen Bohon, instructor at CWRU and a lead scientist for the Center for Synchrotron

Biosciences, added, “The NSLS II XFP beamline will surpass our current cutting-edge facility...as the premier resource for synchrotron footprinting in the world.”

“The new beamline has the potential to enhance the capabilities of the center and will allow researchers there to obtain more detailed structural information that can benefit the entire scientific community,” said Alan McLaughlin, Director of the Division of Applied Science and Technology at NIBIB, which has supported the CWRU Center for Proteomics and Bioinformatics since 2005 through the Case Western Reserve Center for Synchrotron Biosciences.

In addition, education and outreach activities conducted by CWRU faculty and staff will be provided at many levels, from training high school students to Ph.D. level scientists, significantly expanding the impact of science.

# Preparing BNL Proposals for Success

By Walter Copan, Manager, Technology Commercialization and Partnerships

Proposals are the lifeblood of BNL, providing funding for research and development programs, Lab facilities and instrumentation, and supporting staff. DOE laboratories and other research organizations are faced with an increasingly competitive and challenging funding environment. BNL’s strategy recognizes this trend, as we seek to diversify the Lab’s funding base in areas of strategic importance. The number, size, and complexity of BNL proposals are increasing. Many major funding opportunities involve leveraging skills and capabilities across multiple participants.

## BLUEPRINT

### BNL Proposals Improvement Team

The lack of a formal proposal preparation and risk mitigation process was an identified weakness at BNL. An audit of proposals and risks to the Lab conducted in 2010 concluded that “...there is no assurance that all risks and required preparations have been evaluated prior to proposal submission.” As part of the Blueprint, the need to strengthen our proposal process resulted in commissioning a Competitiveness Improvement Project (CIP) team through a Blueprint initiative. Associate Laboratory Director for Global and Regional Solutions (GARS) Gerry Stokes was the CIP team sponsor, and I served as team leader.

The Proposals CIP team, made up of members from across the Lab, gathered information from all functions involved in the proposal process. The team also benchmarked best practices from other national laboratories, universities, and corporations.

### Proposals Prep and Risk Process

The primary goal of the CIP team was to establish a process to address effective proposal preparation and risk mitigation — a process we now call Prep and Risk. The objective of BNL’s Prep and Risk process is to prepare proposals for successful project execution and minimize the risk of execution through mitigation strategies built into the proposal and project plans. The process is designed to support principal investigators (PIs) by including early inputs on the proposal by

the PI’s Business Office, BNL’s Partnerships Office, the directorate’s Research Operations office, and the PI’s Department Chair or Division Director and Associate Laboratory Director.

### Online Prep and Risk System

This Prep and Risk process is supported by a new Proposal Prep and Risk System (PRS, <http://1.usa.gov/PcruAt>). More information about the Prep and Risk process, a system guide, a training video, and frequently asked questions are available through the online system. A BNL Prep and Risk Questionnaire (PaRQ) that addresses key parts of proposal preparation and risk mitigation is the main part of the online system. Some of the questions are familiar because they are modeled after the Proposal Information Questionnaire (PIQ) that is submitted with the final proposal to the Department of Energy. The online system creates the PIQ document, using the inputs entered about the proposal. The PRS is accessible from remote locations to authorized users through a secure internet connection. This system is now available for all BNL proposals.

### All BNL Proposals to go Through Prep and Risk Process

As of October 1, all BNL proposals will be processed through this system, with the exception of the normal budget cycle Field Work Proposals (FWPs) submitted to DOE. The Prep and Risk System is to be used with the preparation of all full proposals, regardless of sponsor. More details about the use of the Prep and Risk process will be incorporated in SBMS during this fiscal year.

Proposal categories that will use the Prep and Risk Process include:

- **External Proposals:** Field Work Proposals submitted to DOE outside the regular budget cycle, Federal and Non-Federal Work for Others (WFO), Cooperative Research and Development Agreements (CRADAs), Agreements to Commercialize Technology (ACT) project, required pre-proposals and required letters of intent, and white papers that have budget numbers included
- **Internal Proposals:** Laboratory Directed Research and Development (LDRD), Technology Maturation, and Program Development

Project changes affecting scope or budget should be updated in the Prep and Risk System, and made available for review and additional inputs, as needed.

### Proposal Information

The PI may add information as it becomes available and upload attachments up through the time that the final proposal documents are submitted. When the PI indicates in the PRS that inputs are “complete,” this will trigger an email to the offices associated with the directorate for review and input. These include Business Operations, the Partnerships Office, and Research Operations. Then, staff in each office will begin reviewing relevant areas.

Where cross directorate resources will be involved in a proposed project, each directorate and its respective support organizations is notified. Often, this will result in a conversation between the support organizations and the PI to address questions and concerns. Actions that are essential will be recorded in the system, together with any steps needed to mitigate risk, providing timely input to the PI and Department Chair or Division Director for the proposal and project plans.

### Proposal Approval

The Prep and Risk System supports the Department Chair or Division Director to identify the level of approval necessary before the final proposal is submitted to the funding authority.

### Prep & Risk System Support

Help and instruction are available in the BNL Prep & Risk System, along with a Prep and Risk System Reference Guide and FAQs. Each department’s Business Office is the primary contact for help and advice about using the Prep and Risk System.

Access the BNL Prep and Risk System (<https://services.bnl.gov/apps/ProposalQ/SitePages/Home.aspx>) to learn more about the process. Additional training opportunities will also be provided. This new process, which has already been tested and used across BNL, will help the Lab increase proposal success and prepare PIs and the Lab for successful project execution. Please contact me or any of the members of the Proposals CIP Team with questions or suggestions.

## Lecture: Unravelling Mysteries Of Pre-Columbian Artifacts, 10/23

Professor José Luis Ruvalcaba of the National Autonomous University of Mexico will give a talk on “The Science in Unravelling the Mysteries of Pre-Columbian Artifacts,” on Tuesday, October 23, at 4 p.m. in Berkner Hall. The talk is sponsored by Brookhaven Women in Science. Ruvalcaba earned his Ph.D. from the *Facultés Universitaires Notre Dame de la Paix* in Belgium, where he studied the analysis of ancient American jewelry using non-destructive ion beams. He is now Chair of the ANDREA network for the non-invasive characterization of the Mexican culture heritage collections. In his talk, he will discuss Pakal’s burial mask from Malinaltepec, the green stone tesserae from the Maya city of Palenque; and metallic artifacts recovered from the sacred cenote of the Maya city of Chichen-Itza in Yucatan.

## AdoptaPlatoon Book & Bake Sale, 10/25

The Brookhaven Veterans Association’s AdoptaPlatoon group is sponsoring a book and bake sale on Thursday, October 25, in Bldg. 400 lobby, 11 a.m.-3 p.m. All proceeds will go toward the efforts of AdoptaPlatoon to support troops in Afghanistan.

**Bakers Needed!** Please wrap goodies you make: cookies, cupcakes, breads (sliced). Items should be wrapped individually in cellophane. Bring contributions to Bldg. 400 lobby at 11 a.m. on October 25. We greatly appreciate your help.



Molecular Sleds from p. 1

New cellular transport

The four articles contain the first examples of proteins sliding along DNA solely to interact with each other, rather than the DNA. This raises the possibility that all proteins in the nucleus of cells interact by sliding on DNA. Four amino acids of the 11-amino-acid “molecular sled” contain a sequence that enables nuclear proteins to enter the nucleus of cells. That sequence appears also to be where the “sled” attaches to DNA. “Since most, if not all, proteins that enter the nucleus contain the DNA-binding portion of the sled, and since the molecular sled slides on DNA, then perhaps most if not all proteins in the nucleus interact with each other by sliding along the DNA,” Mangel said. The high concentration of DNA inside a virus particle (and the nucleus of a cell) may offer an explanation for why such

sliding takes place. In both environments, the DNA is so densely packed, there’s no room for simple diffusion. “If one were to take the DNA from the nucleus of one human cell and stretch it out, it would be 7 feet long,” Mangel said. “How can the protease find the proteins it has to cleave in such a DNA dense environment? Most everywhere it would move, it would bump into DNA, not its target proteins,” he said. But a protein sliding along the DNA could easily move around to find its targets. Such a mechanism might also greatly improve the efficiency of molecular interactions. Normally in solution, for two molecules to bind to each other, they must collide at a specific speed into specific sites on their surfaces. In most collisions the molecules recoil and move apart, Mangel explained. But if both molecules are bound to DNA and one or both slide on the DNA, then the speed at which collisions occur is mostly determined by the speed of the sled, and the angle of the collisions is fixed by the interaction of the proteins with DNA. “This could give rise to chemistry that is far more efficient, in which almost all collisions by sliding lead to binding,” Mangel said. To explore the process further — and how universal the sled mechanism might be — the group is now studying nuclear proteins that have nothing to do with DNA metabolism to see if they also slide on DNA. Financial support for this research comes principally from the National Institutes of Health (NIH), specifically: the National Institute of Allergy and Infectious Disease, the NIH Director’s Pioneer Award, the National Institute of General Medical Sciences, the U.S. National Science Foundation, the Laboratory

Directed Research & Development program of BNL, the Swiss National Science Foundation and the Kanton Zurich, and grants from the *Ministerio de Ciencia e Innovación* of Spain. Some data were collected at beam line X-25 of BNL’s National Synchrotron Light Source, which is supported by the DOE Office of Science, the National Center for Research Resources, and the National Institute of General Medical Sciences of the NIH. DOE’s Office of Science is the single largest supporter of basic research in the physical sciences in the United States, and is working to address some of the most pressing challenges of our time. For more information, please visit [science.energy.gov](http://science.energy.gov). — Nick Statt For the four *J. of Biological Chemistry* abstracts, see <http://www.bnl.gov/newsroom/news.php?a=11458>.



J.R. Drenth

Catch Up on BERA Trips, Events

Tickets for the following trips or events are now on sale at the BERA Store in Berkner Hall (Bldg. 488), open Monday through Friday, from 9 a.m. until 3 p.m. All tickets are non-refundable and are for those 21 years and older unless accompanied by BNL employee/parent. **Book Fair:** Mon. & Tues., 11/26, 27, from 10 a.m. to 2 p.m. each day. In the lobby of Berkner (Bldg. 488). Books, stationery, scrapbooking accessories, music collections, early learning tools, more. **Do-as-You-Please in New York City:** Sat., 12/1, dep. Lab 10 a.m., dep. midtown 7 p.m. \$10/person, under 3 free on lap. **BERA Holiday Party:** Fri., 12/7, \$60/person full buffet, bar, DJ, at Hotel Indigo, Riverhead. Spend night for \$72 with full breakfast. **Radio City Christmas Spectacular:** Sun., 12/9, dep. Lab 7 a.m. (9 a.m. show,) then see tree, etc. Dep. NYC 3:30 p.m. \$70/person. **NY Nets:** At the new arena in Brooklyn. Nets vs. Dallas on March 1, 2013. \$75/person for 8 p.m. game. **Discounts:** BERA lists many local stores and restaurants that give discounts to BNL employees. See <http://intranet.bnl.gov/bera/recreation/>

Brookhaven National Laboratory

HEALTHFEST2012

The BNL community is invited to participate in the annual month of health, safety, and wellness events held during all October. There is something for everyone. Details: <http://1.usa.gov/OPWypj>

**Talk: ‘All You Need to Know About Vaccines’ on Monday, 10/22**  
A talk titled “All You Need to Know About Vaccines for You and Your Family” will be given in Berkner Hall, noon -1 p.m.  
**800-yard Swim on Thursday, 10/25**  
The 800-yard swim will be held at the pool (Bldg. 478), 11 a.m. - 1:30 p.m. All are invited to swim. This is also the second of two events for the Healthfest Biathlon.

**Mountain Bike Ride on Friday, 10/26**  
Join a mountain bike tour on site. Bring your own bicycle and helmet. Meet at noon at the gazebo (map: <http://1.usa.gov/R4zq21>).



Don't worry if you run past this box turtle on site — he goes at his own pace.



Joseph Rubino



Joseph Rubino



Joseph Rubino

Retirees, Keep in Touch — Join BREA

The Brookhaven Employees’ Recreation Association, known as BREA, welcomes retirees as BREA members. BREA’s purpose is to further retiree interests and benefits, to build closer community ties between BNL and its neighbors, and to encourage communications and activities within the retirement community. BREA holds monthly meetings to discuss Lab events, hear presentations from Lab personnel, and plan future activities. BREA also organizes occasional lunchtime lectures and tours of Lab facilities, and publishes a quarterly newsletter. BREA is represented on the BNL Community Advisory Council and keeps Lab administration aware of retiree concerns. A highlight of the year for many BREA members is the annual luncheon, when many friends and former colleagues gather to renew old ties. This year’s luncheon, which was organized by a committee chaired by Ken Mohring, was held at the Bellport Country Club (see photos above). To join BREA, send your last name, first name, middle initial, address, phone number, and email address, with a check made out to BREA for one year’s dues (\$10) or five years’ dues (\$40), or life membership (\$95). Mail this to BREA, BNL, Bldg. 421, Upton, NY 11973. Membership is free to new retirees for the remainder of the calendar year in which they retire.

CALENDAR

Friday, 10/19

BNL's Chemistry Bldg. Designated Historical Landmark  
9 a.m. Hamilton Seminar Room, Bldg. 555. Ceremony: American Chemical Society NY Section honors BNL chemistry, followed by scientific talks until 12:30 p.m. <http://www.bnl.gov/newsroom/news.php?a=11460>

— WEEK OF 10/22 —

Monday, 10/22

\*Healthfest Talk on Vaccines  
Noon-1 p.m. Berkner Hall. “All You Need to Know About Vaccines for You and Your Family.” Lab community all invited.

Tuesday, 10/23

\*Talk on Unravelling Mysteries of Pre-Columbian Artifacts  
4 p.m. Berkner Hall. Jose Luis Ruvalcaba, National Autonomous University of Mexico, will talk on “The Science in Unravelling the Mysteries of Pre-Columbian Artifacts,” sponsored by Brookhaven Women in Science. All welcome. See p. 3.

IBEW Meeting  
6 p.m. Centereach Knights of Columbus Hall, 41 Horseblock Rd., Centereach. A meeting for shift workers will be held at 3 p.m. in the union office. The agenda includes regular business, committee reports, and the president’s report.

Thursday, 10/25

\*Healthfest 800-Yard Swim  
11 a.m.-1:30 p.m. Swimming Pool, Bldg. 478. All are invited to swim. The 800-yard event is also the second of two events for the Healthfest Biathlon.

\*AdoptaPlatoon Book & Bake Sale  
11 a.m.-3 p.m. Bldg. 400 lobby. All items will be \$1 each, proceeds toward supporting troops abroad. Bakers are needed. Please bring wrapped goodies of suitable size for \$1 sale to Bldg. 400 lobby at 11 a.m. Thank you.

Friday, 10/26

\*Healthfest Mountain Bike Ride  
Noon. Gazebo, ball field area. Bring your own bicycle and helmet. (see map: <http://1.usa.gov/R4zq21>)

— WEEK OF 10/29 —

Thursday, 11/1

Sam's Club Wholesale Club  
11 a.m.-1 p.m. Berkner Hall lobby. Representatives of Sam's Club cooperative shopping club will detail discounts, etc.

— WEEK OF 11/5 —

Thursday, 11/8

BSA Distinguished Lecture  
4 p.m. Berkner Hall. John Milnor, Professor and Co-Director of the Institute for Mathematical Sciences at Stony Brook University, will talk on “History of Topology of Spheres.” All are invited to this free public lecture, sponsored by Brookhaven Science Associates. Visitors to the Lab of 16 or older must carry a photo ID.

Friday, 11/9

BJ's Wholesale Club  
11 a.m.-1 p.m. Berkner Hall lobby. Representatives of BJ's cooperative shopping club will detail discounts, etc.

Arrivals & Departures

— Arrivals —

Tara Shiels..... CEGPA  
Christopher Stebbins ..Photon Scis

— Departures —

Joseph Cosentino .....Photon Scis  
Edgar Perez .....Qual Mngmt  
Celeste Tymann ..... Staff Services  
Vitaly Yakimenko ..... Physics





Alex Fleben  
V0031012

# Tree-felling Accident Spurs Chainsaw Training for Site Services

After a tree-felling incident resulted in a serious employee injury, the Site Services Division worked with the Wildfire Academy to provide training for its staff, as Tom Lambertson explains in a video online: <http://1.usa.gov/RyXfzl>.

**Safety** makes science possible at Brookhaven National Laboratory

## Classified Advertisements

### Placement Notices

The Lab's placement policy is to select the best-qualified candidate for an available position. Candidates are considered in the following order: (1) present benefits-eligible employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present benefits-eligible employees within the Laboratory; and (3) outside applicants. In keeping with the Affirmative Action Plan, selections are made without regard to age, race, color, religion, national origin, sex, disability or veteran status. Each week, the Human Resources Division lists new placement notices, first, so employees may request consideration for themselves, and second, for open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people. Except when operational needs require otherwise, positions will be open for one week after publication. For more information, contact the Employment Manager, Ext. 2882. Access current job openings on the World Wide Web at [www.bnl.gov/HR/jobs/](http://www.bnl.gov/HR/jobs/).

To apply for a position, go to [www.bnl.gov](http://www.bnl.gov). Select "Job Opportunities," then "Search Job List."

### OPEN RECRUITMENT – Opportunities for Lab employees and outside candidates.

**CUSTODIAN (Temporary) (LG-1)** – Requires one year of custodial experience, including stripping and waxing floors, commercial carpet cleaning, and ability to operate commercial cleaning machines. Must be flexible and customer oriented. Must be able to read and comprehend OSHA Material Safety Data Sheets and other job related documents. Must have a valid driver's license and the ability to pass computer based training. Under general supervision, performs general cleaning and housekeeping duties in all Laboratory buildings. Site Resources Division. Please apply to Job ID # 16215.

### Motor Vehicles

10 HONDA FIT, SPORT – 25K mi. light blue, a/c, p/w, p/l, am/fm/MP3 w/aux input cabs, paddle shifters, immaculately maintd. \$14,000. Lee, Ext. 6306, [michel@bnl.gov](mailto:michel@bnl.gov).  
07 SUBARU LEGACY OUTBACK 2.5 – 72K mi. a/t, a/c, ABS, awd, am/fm/CD, rem str, heatd seats, r/rack, 1/owner, all maint, excel cond. \$11,500. Ext. 6344, [phraner@bnl.gov](mailto:phraner@bnl.gov).  
07 VW RABBIT – 18K mi. pristine cond, v/low mi, a/t, a/c, p/s, p/w, p/l. \$9,900. 689-8548 or [jcl@bnl.gov](mailto:jcl@bnl.gov).  
00 HYUNDAI ELANTRA – 139K mi. orig owner, 4/dr Sdn, a/t, a/c, 4/cyl, 4 new tires/batt/timing belt, radio, air bag, clean, maint records. \$2,850 neg. Ext. 2280.  
99 TOYOTA COROLLA – 172.6K mi. 4 dr Sdn, 4 cyl, a/t, a/c, radio/cass, MP3, air bags, new: 4/tires/tune-up/brakes/batt, 34/hwy, alarm, rem. str. \$2,500 neg. 718-737-1757.  
90 GMC S-15 PICKUP – cell phone, 745-2420. \$700 neg. bill james, 727-2395.  
63 FORD F100 – 41K mi. '63 F100, restored 91-92, gard w/less than 500 mi since, 6-cyl, 3-spd, e-mail for photos. \$7,500 neg. 848-9167, [tom@pirate50.com](mailto:tom@pirate50.com).

### Audio, Video & Computers

500 GB HARD DRIVE – Western Digital WD5000KS internal SATA hard drive. Perfect cond, no bad sectors. \$40. Travis, [shrey@bnl.gov](mailto:shrey@bnl.gov).

### Furnishings & Appliances

BATH TUB/SOWER TRANSFER BENCH – lightly used, for handicapped person. <http://tinyurl.com/98bwajs>, \$30. Ext. 3546.  
CHILDRENS' WINTER COATS 7/8 – Polo, down, navy blue/\$30; North Face, black/\$50. [dmcathur@bnl.gov](mailto:dmcathur@bnl.gov).

DINING ROOM SET – Solid Oak 8 pc-China top, buffet, oval table/4 leaves, 6 chrs, cust tbl pads, pics, \$600/obo, must sell by early Nov, Sallie, Ext. 2746.  
DINING TABLE SET – wood, table and 4 chairs, less than a yr old/\$75. Ext. 3546.  
END TABLES – Two square end tables, medium wood with glass tops. Good condition. \$80/both. Donna, Ext. 2716, 897-2736 or [storan@bnl.gov](mailto:storan@bnl.gov).  
ROLL TOP DESK – Oak, 50"L, 22"w, desk surface 18.5 x 46 excel cond u-pic-up, \$300. Peter, Ext. 2522 or [boylep@bnl.gov](mailto:boylep@bnl.gov).  
SOFA – photos avail, 88"x 34" off white w/light floral tapestry, ideal for l/r guest rm, lg, comfy for sleeping, \$150/obo, Jane. Ext. 2198, 909-7080, [lysik@bnl.gov](mailto:lysik@bnl.gov).  
STAINLESS STEEL CONTEMP BED – full size, \$150, pics avail. [dmcathur@bnl.gov](mailto:dmcathur@bnl.gov).  
TABLES – end table, dark wood; storage table w/drs and marble top, wrought iron stand, dry sink, \$60-\$150, pics avail. Lynda, Ext. 7235 or [fitz@bnl.gov](mailto:fitz@bnl.gov).  
TV CABINET/W STORAGE – Photos avail, 17.5w x 28h x 18d, black w/2/shelves and smoked glass from drs. ask/\$20. Ext. 2198, 909-7080 or [lysik@bnl.gov](mailto:lysik@bnl.gov).  
WALL UNIT – 3 pc solid oak wall unit. Two sidepieces 33" x 60," middle pc 48" x 60", excell cond. \$350, pics avail. Diana, Ext. 3681, 922-0104 or [teich@bnl.gov](mailto:teich@bnl.gov).

### Sports, Hobbies & Pets

75 GAL TANK – & black metal stand/\$100. Matthew, [mvescovi@bnl.gov](mailto:mvescovi@bnl.gov).  
AB LOUNGE 2 MAX – like new, set up and ready to go, a great AB workout/\$20. [brookhaven@optonline.net](mailto:brookhaven@optonline.net).  
BASS GUITAR – V-amp Pro preamp \$100; Hellbabe wah pedal \$30; Overdrive pedal BOD100, \$20. Chris, Ext. 5405 or [camundsen@bnl.gov](mailto:camundsen@bnl.gov).  
COLEMAN 8-PERSON INSTANT TENT – brand new still unpacked Coleman 8-person tent, see <http://tinyurl.com/9ot4g3w>. ask/\$150. Muralidhar, Ext. 3546.  
CORN SNAKE – w/20 gal tank/cover/heat lamp/water bowl/heater. Richard, Ext. 7129.  
EXCERISE BIKE – Weisio Pursuit 622 excercise bike/\$35; dual motion Nordic-tider/\$35, both v/gd cond. 603-6285.  
LAX REBOUNDER/ GRILL/XMAS DECO – new, \$150/neg, gas grill, needs cleaning/\$50; outside Xmas decors, motorized deer, prelit trees/\$25/ea. [dmcathur@bnl.gov](mailto:dmcathur@bnl.gov).  
SWING SET – by Wood Kingdom, 2/ swings, trapeze bar and tower w/slide, \$150. 591-2272.  
TREADMILL – Proform 515 TR treadmill about 4 yrs old, excel cond. Hardly used. Ask \$225. 680-7920 or [acanestro@aol.com](mailto:acanestro@aol.com).  
WETSUIT – Youth size 12, excel cond, pd/\$110, ask/50. Lynda, Ext. 7235.

### Tools, House & Garden

LOVESEAT – sage green, w/green/cream check, print back cushions, rounded arms, simple style, gd cond. Photo available. \$75. You pick up. Kathleen, Ext. 7114.  
LAWN MOWERS – 1/elect, Black&Dckr, 18" deck/\$30;1/gas yd machine, 22" deck, 3.5 Briggs/startin/\$60; 2/dehumidifiers/LG/\$45/Kenmore/\$75, both excel 603-6285.

### Miscellaneous

FOOT/LEG MASSAGER – multiple settings, seen in Brookstone, zip out washable liners, works perfectly, excel cond, orig/\$500, ask/\$210. 516-241-4598.  
JETS TICKETS – 2, vs Dolphins, Sun, Oct 28, 1pm, tickets/prkg pass Section 250B Row 7, seats 17 & 18, \$275/all. 766-0252.  
JETS TICKETS – 2, vs Patriots, Thurs, Nov 22, 8:20pm, tickets/prkg pass, Section 250B Row 7, seats 17 & 18, \$275/all. Frank, 766-0252.  
MIRRORED MEDICINE CABINET – 36Wx32Hx5D, \$25. Vanity countertop w/ sink & plumbing, 48Wx22D, \$50. Karl, Ext. 3116.

# Save the Date: Saturday, 11/3 BERA African American Affinity Group To Host 'Gospel Fest' at Brookhaven Lab

Preparations are revving up for the Gospel Fest to be hosted by the BERA African American Affinity Group in Berkner Hall on Saturday, November 3, at 6 p.m.

Gospel Fest will feature groups and soloists from within and outside the Lab. Tickets purchased in advance will be \$12 for adults, \$10 for children under 12 and \$15 at the door. Tickets are available at the BERA Store in Berkner Hall or through Tanya Collins, [tcollins@bnl.gov](mailto:tcollins@bnl.gov), 764-3507, or Ext. 5344; or Patrice Greenwood, Ext. 7176, [greenwood@bnl.gov](mailto:greenwood@bnl.gov). Doors will

open at 5 p.m. Refreshments will be served. Visitors to the Lab of 16 and older must carry photo ID.

Among those performing will be BNL retiree and poet Robert Brown, two-time Gospel Fest winner Minister Michael Davis, Pastor Charlotte Holly, the "Heaven Sent" Gospel group singers, 2011 Gospel Fest winners Daphne's Divine Dance group, and, from BNL: Arthur (Skip) Anderson, George Yancy, Rosa Palmore, Joy Epps, and many more. All are welcome to attend this exciting event.



Roger Stoutenburgh  
D2021012

BNL Gospel Fest performers – (back, second from left) Bob Brown, Arthur (Skip) Anderson, Rosa Palmore, and Joy Epps, with George Yancy at the piano – with Gospel Fest co-organizers Gloria Bennett (left) and Menzel Smith-Jones (right) of the BERA African American Affinity Group

**MOREY'S PIERS WILDWOOD TICKETS** – 4 Three Pier Tickets avail, best Halloween Attraction EVER, grt for kids Gd until end of season, b/o gets the tickets. worth \$225. Menzel, Ext. 4495.

**PHOTO FRAME & CROSS** – frame for goddaughter, pink & wh, 4x6 photo. Wall cross pewter & pink, 6"L. Both new in boxes. \$10 ea, \$15/both. Ext. 7114.

**PROM/SWEET 16/PARTY GOWN** – Sapphire blue satin, silver beading, sweetheart bodice, front slit, new w/tags, orig/\$400, now/\$150. 516-241-4598.

**SWEET 16/PROM/PARTY GOWN** – Emerald green w/corset back, crystal beading, drop waist, sweetheart bodice, fits 14-16, orig/\$400, now/\$150. 516-241-4598.

### Wanted

**BOX TOPS FOR EDUCATION** – Be a hero for local students! Found on products by Pillsbury, Betty Crocker, Kellogg's, etc. Please send any you may come across to bldg. 510A. Thank you! Nicole, Ext. 3807.

**FIREARMS** – new or old, I will pay Fair \$\$ depending on cond and age. Please, NO firearms on BNL property. Joe, 487-1479.

**HOUSE TO RENT** – for a couple, preferably 3 bdrms and at least 1.5 bath, around BNL or slightly west. [nnambiar@bnl.gov](mailto:nnambiar@bnl.gov).

**LOOKING FOR BAKERS** – Adopt-a-Platoon Book & Bake sale will be Oct 25 and we need volunteers to bake. Please cover your delights in saran wrap or baggies. All items will be sold for \$1, thank you. Joanne, [jula@bnl.gov](mailto:jula@bnl.gov).

**POP TOPS FROM SODA/BEER CANS** – collecting for Shriner's Children's Hospital. Please send or drop off @ Bldg 400A, Transportation Office. Paula, Ext. 2535.

**PS3 SOFTWARE TECHNICIAN** – Looking for someone who is familiar w/re-marrying my bluray dr circuit brd to my motherbrd, Sftware can be downloaded, so I've heard. Thanks! Ricky, 655-6989 or [mercado@bnl.gov](mailto:mercado@bnl.gov).

**STUDENT IN NEED OF MATH TUTOR** – Looking for students in primary or secondary school in need of a Math Tutor. email me for details. Sophia, [smarneris@bnl.gov](mailto:smarneris@bnl.gov).

### Free

**STORM DOOR** – aluminum, white. Richard, 744-6794.

### Community Involvement

**CHILD SAFETY ID PROGRAM** – To be held at the Rocky Point Fire Department on Oct 28, 9am - noon. The program is free and open to the public. Russ, Ext. 2132 or [wobrien@bnl.gov](mailto:wobrien@bnl.gov).

**ADOPT-A-PLATOON** – Monetary donations gratefully accepted towards mailing shipments to our platoon stationed overseas and to send goodie packages to BNL family members. Thank you. Joanne, Ext. 8481.

### Happenings

**ESSENTIAL OILS GATHERING** – On 10/29, Learn how Essential Oils can be used for health challenges/restore calm/balanced mood/enhance mental focus/stop colds&flu/ease pain/depression & much more. RSVP, 344-7226, [skiss@bnl.gov](mailto:skiss@bnl.gov).

### For Rent

**FARMINGVILLE** – Fully furn oversized legal sudio apt. liv rm.lg bdrm, full kit/bath. pri.ent/drivwy/yd. util incl. cable, own thermostat, no smokg/pets 1 mo sec/rent. 12 min. to Lab. \$900/mo. 732-2472.

**HOLTSVILLE** – 1 bdrm apt, l/r, kitch & bath, no smkg/pets, util incl, 1/mo/sec, 12 mins to Lab. \$900/mo. 289-9727.

**ISLANDIA** – 1 bdrm bsmt apt w/3 full windows, single adult, no pets, non-smkr, cable/elect heat all incld. \$900/mo. Angelo, Ext. 8004 or [acaruso@bnl.gov](mailto:acaruso@bnl.gov).

**MASTIC** – 1/bdrm bsmt apt, off st prkg, utils incl, 1/mo sec reqd, priv ent. \$1,000/mo. Stacy, 395-6428.

**MASTIC** – Cozy 2-bdrm single family house, 1 bath, lr/dr combo, fenced yard. Small pet considered. 2-mo. sec. Utilities not included. Avail. Nov. 1. \$1,525/mo. 775-8703.

**MASTIC** – 1 bdrm bsmt apt, v/clean, new applis, lg closet, no smkg/pets, sep ent/prkg. \$800/mo. Sandy, 317-5534.

**MATTITUCK** – v/priv furnrd/unfurnrd 1 bdrm gar apt, totally sep from main hse w/priv drway, utils incld, Denis or Sharon. \$1,100/mo. 298-8104.

**RIDGE** – 1 bdrm apt, l/r, kitchenette, full bath, priv yd, ent, no/kids/smkg/pets, util incld. \$975/mo. 924-0002.

**ROCKY POINT** – Studio apt w/full bath & kitchenette, no smkg, partially below ground, utils incld, 19 mins to Lab, 1 mos sec. \$700/mo. Justine, Ext. 2114.

**SHOREHAM** – cul-de-sac, 1 bdrm, 1/sm office, l/r, kitch, full bath, priv ent, drvwy, own thermostat, a/c, cable, DVR box & int, w/d, for single or couple, no pets/smkg. \$1,350/mo. 445-7838.

### For Sale

**BAYPORT** – Frank Lloyd Wright-style, 2,300 sq ft house, 1 wooded acre nr Grt S. Bay, 4 bdrm, 2 & half bath, open flr plan, lg windows, radiant heat, screened porch, excel schools. \$499,000. 617-332-6264.



**CORAM** – lg 1 bdrm co-op, updated kitch & b/r, laundry across from unit, in/outdr pool & gym. \$99,900. Warren, Ext. 8329 or [whalbig@bnl.gov](mailto:whalbig@bnl.gov).

**PORT JEFF STATION** – 3/bdrm, 2/bath Co-op 2nd flr, new b/rms, neutral w/w rugs, applis, gated comm w/swimming pool, BBQ, laundry on premises, near SBU/BNL. \$142,000. 431-4551.

**ROCKY POINT** – 4 bdrm, 4 ba chalet, 1.2 wooded acres, nr beach, ELK, granite counters, ss applis, huge lvrn, dr, fp, hardwd flrs, porch, A/C, 2-car gar, igs, quiet n/hood, legal m/d. \$435,000. 894-4320.

**RONKONKOMKA** – Sachem school district, 5 bdrm, 3.5 bath, den, lr/dr, all updates in kitch/bath, igs, pvt, lg property. \$380,000 neg. [dmcathur@bnl.gov](mailto:dmcathur@bnl.gov).

**SAYVILLE** – expnd'd ranch, 10/rms + sunrm, incld den w/fp, 3/bdrms, 1.5 baths up, 3 rms + .5 bath dwn, lgpp, cac, 1 car gar, new kitch, heating sys, gutters, excel cond & location. 1st. \$340,000. 431-4551.

### In Appreciation

**WEDDING** – Thank you my BNL Friends for attending my wedding, which was a great success. Thanks for the cards, your presence and your love.

– Joanne and William McPherson,

### Services

A list of services by BNL employees is available, call Ext. 2346 and leave an address or contact [lseubert@bnl.gov](mailto:lseubert@bnl.gov).