the Bulletin

BROOKHAVEN NATIONAL LABORATORY

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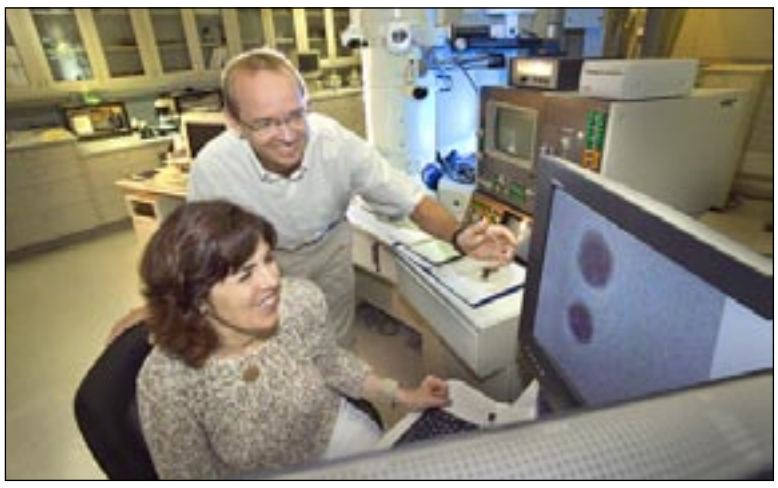
Scientists Study, Learn to Prevent Nanoparticle 'Merging'



Roger Stoutenburgh D0550905

Researchers Eli Sutter (front) and Peter Sutter at BNL's transmission

Researchers at BNL have identified how billionth-of-a-meter sized metal particles — gold-atom clusters within carbon-atom shells — can mesh together to form larger particles, and they have also found a way to control this process. The results, published in *Nano Letters*, Vol. 5, p. 2092-2096, 2005, may help scientists determine how these nanoparticles, which have unique physical, chemical, and electronic properties, could be incorporated into new technologies. The research was funded by the Office of Basic Energy Sciences within DOE's Office of Science.

"Nanostructures that consist of a metal nanoparticle trapped within a carbon cage have great technological promise, such as in electronics and biomedical imaging systems, but scientists have more to learn about them," said Eli Sutter, a scientist at BNL's Center for Functional Nanomaterials (CFN) and the study's lead author. "For example, knowing how to control the size of the particles is very important because size is strongly linked to properties like electronic structure and melting temperature."

Sutter, with researchers Peter Sutter and Yimei Zhu, both also of CFN, studied small groups of gold nanoparticles supported by a layer of carbon atoms. They watched the particles interact using a transmission electron microscope, which creates an image of a sample by bombarding it with a beam of electrons. They imaged the particles at "low" temperatures, from room temperature to 400 degrees Celsius (°C), and again at high temperatures from 400°C to 800°C.

At low temperatures, the group found that gold particles can mesh together by forming a bridge between them that is only one atom wide. Once this bridge is built, gold atoms can shuttle back and forth between the particles, much as automobile traffic flows over a bridge. This exchange of gold atoms eventually leads to the merging of the nanoparticles connected by the bridge and the formation of a larger particle.

At high temperatures, however, the interaction between the nanoparticles changed significantly, and involved the carbon atoms underneath. The carbon atoms near each particle, immobile at low temperatures, began to cluster together, forming a jumble of fragments and layers. When the researchers increased the intensity of the microscope's electron beam, the carbon fragments began to creep up and around the particles, eventually forming shells that completely enclosed them, much like nut shells enclosing small kernels.

"Almost immediately we noticed that the carbon shells seem to prevent the gold nanoparticles from coalescing, even over long periods of time," said Sutter. "We wondered if there were conditions that would allow them to merge."

They discovered that repeatedly switching the electron-beam intensity from high to low caused a carbon shell to form around the entire particle assembly. And then something surprising happened: Instead of further preventing the particles from interacting, the large carbon shell seemed to physically squeeze them together, much like a nutcracker cracking a nutshell.

"The large shell exerted pressure on the particles within it,

(continued on page 2)

BNL's Office of Educational Programs Celebrates New Era in Science Education:
Science Museum Renamed the BNL Science Learning Center

BNL's Office of Educational Programs (OEP) recently celebrated a new era in science education with the addition of new student and teacher programs that will be offered in 2006. To mark the occasion and to reflect this new era, the BNL Science Museum changed its name to the BNL Science Learning Center (SLC) on November 15 and commemorated the day with a ceremony at the facility. About 120 BNL staff and local educators attended the event.

Speakers included OEP Manager Kenneth White, BNL Deputy Director for Science Peter Bond, DOE Brookhaven Site Office Manager Michael Holland, and SLC Supervisor Gail Donoghue. Among the highlights of the ceremony were talks by two special guests: Alan Friedman, Director and CEO, New York Hall of Science, who spoke on "Parallel Pathways: The Relationship Between the Formal and Informal Pathways to Learning Science and Technology;" and Steven C. Englebright, New York State Assemblyman, 4th District, who spoke about "The Importance of Building a Skilled Workforce on Long Island."

OEP has established a number of partnerships and has been awarded grants in collaboration with researchers to initiate new, hands-on programs for students and teachers, White said. Geared toward middle and high school levels, the new programs will be focused on BNL research and take advantage of the unique facilities and intellectual resources at the Lab. Among subjects covered will be protein structural biology in 3-D, protein extraction and purification, DNA extraction and analysis, and toxic metal-contaminant removal from soil using citric acid. These programs are being developed in partnership with BNL researchers, as well as Stony Brook University and Hofstra University faculty.

Joseph Rubino D1831105

(From left) BNL Office of Educational Programs Manager Kenneth White, New York State Assemblyman Steven C. Englebright, New York Hall of Science Director and CEO Alan Friedman, and BNL Science Learning Center Supervisor Gail Donoghue enjoy an exhibit called "Marscape" at the Learning Center.

Friedman said that the 350 science centers and science museums in the U.S. are important as places where students become excited about learning, and "want to know more when they leave." The informal atmosphere of a science center provides a place for "pure enjoyment" as well as learning — an excellent adjunct to school learning.

Englebright remarked that SLC is not just a "nice thing." It is, in fact, a "necessary thing" for an institution like Brookhaven that depends upon taxpayer support. Also, he said, it is important to have an edu

(continued on page 2)

410th Brookhaven Lecture, 12/21
'Hotter, Denser, Faster, Smaller . . . and Nearly Perfect: What's the Matter at RHIC?'

The collisions of two beams of heavy-ion particles — atoms stripped of their electrons — speeding around BNL's immense Relativistic Heavy Ion Collider (RHIC) have long been expected to create a "quark-gluon plasma" in which the quarks and gluons that make up the protons and neutrons in the ions would move freely in a plasma-like system. But the final particles, detectable in the four experiments placed around the RHIC ring, tend to hide information about the earlier, hotter stage. So it is a challenge to elucidate the nature of the primordial system.

What surprised scientists, however, was how strongly the quarks and gluons seemed to interact during the collision. This strong interaction makes the system produced at RHIC behave almost like a perfect fluid, one in which the hot matter formed shows a high degree of collectivity among the particles, rather than a gas, in which individual molecules move about randomly.

Evidence from the four RHIC detectors has shown that the system formed at RHIC is potentially the most perfect fluid found in nature, at least since a few microseconds after the Big Bang, a state which RHIC was built to re-create. This result is all the more amazing since the system is so small, the collisions forming over distances 100 times smaller than a proton, and forms so quickly, in times on the order of a millionth of a billionth of a billionth of a second (10^{-24} seconds). It was even interesting enough to the wider physics community to warrant first place in the American Institute of Physics' year-end review of top physics stories.

Roger Stoutenburgh D1311205

Peter Steinberg

To find out more about the basic physics of the quark-gluon plasma and RHIC, with a focus on several intriguing results from RHIC's recently ended PHOBOS experiment, join Peter Steinberg, a physicist in the Chemistry Department, as he gives the 410th Brookhaven Lecture, titled "Hotter, Denser, Faster, Smaller . . . and Nearly Perfect: What's the Matter at RHIC?" Steinberg, the project manager of the recently decommissioned PHOBOS experiment, will give the lecture on Wednesday, December 21, 2005 at 4 p.m., in Berkner Hall.

Steinberg joined BNL in 1999. He received his undergraduate degree in political science from Yale University in 1992, and his Ph.D. in physics from the Massachusetts Institute of Technology in 1998, and was also a postdoc at Columbia University. Since January, he has been participating in the "Quantum Diaries" project, followed by many at the Lab and beyond, as part of BNL's participation in the World Year of Physics.

All are welcome to attend this free lecture, which is open to the public. Visitors of age 16 and over must carry a photo ID. Refreshments are served before and after the talk, and anyone wishing to join the lecturer at an off-site restaurant for dinner afterwards may contact Fulvia Pilat, Ext. 3134, pilat@bnl.gov.

Calendar
of Laboratory Events

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

— EACH WEEK —

Weekdays: Free English for Speakers Of Other Languages Classes
Beginner, Intermediate, Advanced classes. Various times. All are welcome. Learn English, make friends. See www.bnl.gov/esol/schedule. html for schedule. Jen Lynch, Ext. 4894.

Mondays & Wednesdays: Pilates
Mondays at noon, Wednesdays at 5:30 p.m., both in Rec. Hall. 9-week session, $60 for once a week, $70 for twice a week. Registration is required. Christine Carter, Ext. 5090.

Mondays & Thursdays: Kickboxing
$5 per class. Noon-1 p.m. in the gym. Registration is required. Christine Carter, Ext. 5090.

Mon., Wed., & Fri.: Tai Chi
Noon-1 p.m., Brookhaven Center North Rm. Adam Rusek, Ext. 5830, rusek@bnl.gov.

Tues. & Thurs: Aerobics
5:15-6:30 p.m., Rec. Hall. 10 classes for $40, or $5 per class, pay as you go. Pat Flood, Ext. 7866.

Tues. & Thurs: Aqua Aerobics
5:15-6:15 p.m. $20 to attend once a week, $40 to attend twice a week. For more information, call Ext. 2873.

Tues. & Thurs: Jazzercise
Noon-1 p.m., Rec. Hall. $88 for twice-a-week eight-week session, you may use the membership at several Jazzercise locations. Christine, Ext. 5090.

Tues. & Thurs.: Ving Tsun Kung Fu
Noon-1 p.m., Brookhaven Center, North Room. $80/month or $10 per class, pay as you go. Taught by Master William Moy. Scott Bradley, Ext. 5745 or bradley@bnl.gov.

Tue., Thu. & Fri: Upton Nursery School
8:30 a.m.-noon, Rec. Hall. 2- and 3-day programs available. Kati, 821-4131.

Tuesdays: Welcome Coffee
10 a.m-noon, Rec. Hall. First Tuesday of every month is special for Lab newcomers and leaving guests. Lisa Yang, 979-3937.

Tuesdays: BNL Music Club
Noon, North Room, Brookhaven Center. Come hear live music. Joe Vignola, Ext. 3846.

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

Tuesdays: Toastmasters
1st and 3rd Tuesday of each month, 5:30 p.m., Bldg. 463, room 160. Guests, visitors always welcome. www.bnl.gov/bera/activities/toastmstrs/.

Tues., Wed. & Thurs: Rec Hall Activities
5:30-9:30 p.m. General activities, TV, ping pong, chess, games, socializing. Christine Carter, Ext. 5090.

Wednesdays: On-Site Play Group
10 a.m.-noon. Rec. Hall. An infant/toddler drop-in event. Parents meet while children play. Fang Dong, 871-5362.

Wednesdays: Weight Watchers
Noon-1 p.m. Michael Thorn, Ext. 8612.

Wednesdays: Yoga
Noon-1 p.m., B'haven Center. Free. Ila Campbell, Ext. 2206, ila@bnl.gov.

Wednesdays: Ballroom Dance Class
$30/pers./6-weeks. Brookhaven Center, N. Ballroom. Beginner rumba, 6 p.m., adv. foxtrot, 7 p.m. Instructor: Giny Rae. John Millener, Ext. 3853; Madeline Windsor, Ext. 5069.

Thursdays: Reiki Healing Class
Noon-1 p.m., Bldg. 211 Conference Rm. Nicole Bernholc, Ext. 2027.

Fridays: Family Swim Night
5-8 p.m. BNL Pool. $5 per family.

Fridays: BNL Social & Cultural Club
6-9 p.m., North Ballroom, Brookhaven Ctr., dance lessons, 9-11:30 p.m. general dancing. Rudy Alforque, Ext. 4733, rudy@bnl.gov.

Two Northport High School Seniors Win BNL Art Prizes


Roger Stoutenburgh D4411105

Laboratory Director Praveen Chaudhari with Christina Riga

Computer-Based Art Award

In the citation for this award, Robert Chrien wrote, "This year BSA has also given an award to a work embodying digital techniques. Computer-based art forms a principal subject in modern schools of art and design. Brookhaven National Laboratory, which has pioneered computer applications in research, acknowledges this importance by awarding the prize to Christina Riga of Northport High School for her digital photograph entitled 'Reflections.' This photo displays a blend of light and colors to lead us down a long corridor to a mysterious and intriguing figure, which beckons us to encounter a new discovery. It is a striking example of how ordinary photographs can be manipulated to produce unusual effects. The old adages of 'seeing is believing' and 'photographs don't lie' are swept away in this new 21st century Art Form.


Roger Stoutenburgh D4431105

Maria Maidakova with Laboratory Director Praveen Chaudhari

Discovery Award

In the award citation for the sculpture "The Offering," Garman Harbottle wrote, "Ms. Baidakova's striking sculpture, appropriately executed in a black volcanic-lava like medium, shows a figure extending one hand, which holds an 'Offering,' to us, the onlookers — and to the world. The offering seems to be a nuclear or atomic representation, but could equally be a symbolic universe, or indeed almost any discovery of modern research. The figure making 'The Offering' has a wonderful expression at once suggesting doubt, uncertainty, and assessment, but perhaps, in the end, hope that the offering will better the prospects of humankind in these dark and troubled days. All these rich crosscurrents are brought together in this work. It is unusual to find such a depth of meaning in the work of a student at this stage of her career, and it is with pleasure that we at Brookhaven by this award recognize her accomplishment."

Maria Baidakova and Christina Riga, both seniors at Northport High School, were the winners of two art prizes given this year by Brookhaven Science Associates (BSA), the company that manages Brookhaven National Laboratory: Baidakova won the 2005 "Discovery Award" for her sculpture called "The Offering;" and Riga was the first winner of the new "Computer-Based Art Award," for her digitalized photograph called "Reflections." Laboratory Director Praveen Chaudhari presented each senior with a certificate and a $500 savings bond at the BNL Art Society Thanksgiving Art and Crafts Show held November 21-23 in Berkner Hall, where the winning art works were accorded the place of honor.

BSA grants the Discovery Award annually to a local high school senior for artwork that best exhibits the spirit of scientific discovery. This year, BSA also established the Computer-Based Art Award to reflect the ever-developing importance of this art form in today's society. The BNL Art Society chooses the prize winners from the artworks exhibited at a show for high school seniors held by the South Bay Art Association (SBAA) each November.

Said Robert Chrien, BNL Art Society President and SBAA Treasurer, "We have become accustomed to the extraordinary standard of excellence in the high school seniors' artworks. Making a choice for a prize winner is a very difficult task." Chrien, a physicist with a special interest in computer-based art, was the judge of this category for the BSA prize, while the Discovery prize was selected by Garman Harbottle of the Chemistry Department, a scientist whose pioneering work in the dating and provenance of materials has kept him in the forefront of research involving art.

"We make our choices from the exhibited works 'blind,' that is, without knowing the names of the student artists or their schools," explained Chrien. "So, it was quite a coincidence that both prizes went to Northport students. The students' art teacher, Richard Nunziato, and the Art Department Head Peter Falotico are to be congratulated."

Both these gifted students plan a career that will enable them to use their talents. Baidakova would like to become an animator, using art to tell stories of character development, while Riga hopes to succeed in the field of computer art and graphic design. — Liz Seubert

Preventing Nanoparticle 'Merging' *(cont'd)*

broke their individual shells, and triggered a merging process that is similar to what occurred at low temperatures," said Sutter. "This was very unexpected."

Sutter and her collaborators concluded that encapsulating individual metal nanoparticles within shells made of carbon or similar materials, which they showed is possible under the right conditions, might be a good way to prevent uncontrolled size changes in nanoparticle arrays.

DOE's Office of Basic Energy Sciences also sponsors and manages construction of the Center for Functional Nanomaterials, (CFN), one of the suite of five DOE Nanoscale Sciences Research Centers. More information about the CFN can be found at www.cfn.bnl.gov.

— Laura Mgrdichian

BNL's Science Learning Center *(cont'd)*

cated workforce for Long Island to continue to be prosperous.

"The goal of the Science Learning Center is to promote science literacy," said Donoghue, adding, "We are much more than a science museum. We provide free programs for students in grades K through 8 that complement formal education in science, and we encourage hands-on learning, which is an effective way for children to learn science."

In FY 2005, the Science Museum provided programs for 28,700 students. In addition to the in-house student programs offered at SLC, the facility provides in-service training for teachers, and outreach programs for students in Suffolk County schools.

Now, in FY 2006, a new program will be offered at SLC for students in grades 4 to 8: "Designing 'Attractive' Structures," using magnetic materials, geometry, and student creativity to design and construct a structure that meets specific design criteria. And two other new programs will be offered for grades 6 to 8: "RHIC and the Big Bang," teaching about the Relativistic Heavy Ion Collider and the Big Bang Theory; and "Static Electricity: An In-Depth Program," explaining the structure of the atom and how static electricity works, and including activities using the periodic table.

Also, two new courses will be offered for elementary school teachers in FY 2006: One on "Physical Science" and another on "The Properties of Light." BNL scientists, as well as SLC educators will teach these programs. — Diane Greenberg

Service Anniversaries

The following BNLers celebrated service anniversaries during October, November, and December, 2005.

October

— 45 Years —
Robert Palmer ..... Physics
Joseph Glenn III ..... C-A

— 30 Years —
Michael Bannon ..... C-A
Frances Ligon ..... BSD
William Schoenig ..... Physics
Patricia Gorden-Ozgul ..... ISD
April Gray ..... Fiscal Svcs.

— 25 Years —
Kathleen Dargan ..... EENS
Francisco Gaetan ..... Plant Eng.
John Bigrow ..... ITD
Kathleen McIntyre ..... Rad. Ctrl.

— 20 Years —
Leesa Allen ..... HR/OM
Deborah Kerr ..... Physics
William King ..... Instrumentation
Alan Gustavsson ..... C-A

— 10 Years —
Robert Pisani ..... Physics
Julie Pergan ..... ITD
Janet Sikora ..... HR/OM

November

— 45 Years —
Harold Hahn ..... C-A

— 40 Years —
Franklin Densing ... Instrumentation
Raymond Zaharatos ..... C-A
Ruth Merker ..... ITD

— 35 Years —
Robert Beuhler ..... Chemistry

— 30 Years —
Keith Lewin ..... Env. Sci.
Samuel Cortes ..... PPM
Maria Beckman ..... ESH&Q
Andrea Epple ..... Rad. Ctrl.
Frederick Kobasiuk ..... C-A
Beatrice Pyatt ..... Medical

— 30 Years (cont'd) —
Stephen Mercier ..... Plant Eng.
Henry Schnakenberg ..... Medical
Dennis Fuzie ..... Staff Svcs.

— 25 Years —
Warren Jappe ..... C-A
Mohamad Azarm ..... ES&T
Peter Zuhoski, Jr. ..... NSLS
Linda Di Pierro ..... HR/OM
Victor Gonzalez ..... CFS
Shu Cheung ..... NSLS

— 20 Years —
Alexsandra Lopez ..... Mat. Sci.
Edwin Cancel ..... PPM
Bonnie Sherwood ..... EENS
Mihai Radulescu ..... NSLS
Sorin Pop ..... NSLS
Marcelino Santiago, Jr. ..... PPM
Jeffrey Mirando ..... ES
Chris Masullo ..... ITD

— 10 Years —
Dennis Ryan ..... Rad. Ctrl.

December

— 30 Years —
Mei Han Chou ..... Chemistry
Nicholas Gmur ..... NSLS
James Bullis, Jr. ..... Medical
Joan Smith ..... ITD

— 25 Years —
George Leskody ..... Plant Eng.
David Dougherty ..... NNS
Vasilis Fthenakis ..... Env. Sci.

— 20 Years —
Nicholaos Tsoupas ..... C-A
William Willis ..... Physics

— 10 Years —
Mary Anne Corwin ..... NSLS
James O'Malley ..... Plant Eng.
Thomas Schlagel .... Director's Office

Taking Steps Up the Ladder of Safety

Whether decorating for the holidays, washing home windows, or doing roof work, most people climb on ladders at some time — and, every year, nearly 30,000 people in the United States are injured by falls involving ladders.

Plant Engineering Division's Pete Stelmaschuk, whose team often uses ladders for work, has these words of advice, "To start, you need to select the right ladder for the task. Then, as you can see by watching anyone who is trained, you should always face the ladder and hold on with both hands. Carry your tools on a tool belt or raise or lower them using a hand line. Another important rule to remember is to have only one person on the ladder at a time."

Once up a ladder, many non-professionals tend to overstretch to get to "that little spot" that is just out of reach of the paintbrush or duster. Overstretching, which can cause neck, arm and general muscle strain, can also cause you to lose your balance and slip and fall off the ladder. A simple rule, says Stelmaschuk, is always to keep your body centered between the two rails of the ladder. — Jane Koropsak

Michael Herbert D1031005

Rich Moretti of the Plant Engineering Division, is working on an on-site apartment building roof.

Ladder tips to follow at work and at home:

- Use the appropriate ladder for the job
- Make sure the ladder is long enough
- When working in windy conditions, do not use a metal ladder unless it is tied. A fiberglass ladder is best for electrical work where electrical conductors may be present
- Always inspect the ladder for damaged rungs or loose screws. Never use a ladder that seems damaged
- Verify that the ladder is stable and can be securely locked in place
- Check your shoes for dirt, ice or greasy types of materials that may cause you to slip
- When you set up the ladder, use a barricade to outline your work area. Make sure that doors cannot be opened and hit the ladder
- Never stand on the top step or top platform of a ladder
- Maintain three-point contact with the ladder, i.e., two hands and a foot or two feet and a hand
- Finally, store your ladder appropriately to avoid warping and sagging. Wood ladders should be protected from moisture and excessive heat

For more information on ladder safety, contact Peter Stelmaschuk, Ext. 3981, stelmas@bnl.gov; or Artie Piper, Ext. 5937, piper@bnl.gov.

On-Site College Course Offered

The following course will be offered on-site for the spring 2006 semester and will satisfy requirements for most Suffolk County Community College degrees. A minimum of 12 students is needed for each course and registration has already begun.

EK11 - Current Economic Issues

Introduces use of economic methods for understanding social and political events dominating news headlines. Crime, health care, poverty, and taxes are important issues in our daily lives and may serve as topics in developing the course. No prerequisite, 3 credit hours.

Employees who take college courses may apply for tuition assistance. BNL offers tuition advances or reimbursements at 75 percent for undergraduate courses. For more information, contact Starr Munson, Ext. 7631, or munson@bnl.gov.

Identity Theft And How To Stop It

The holiday season is a festive time for most, but, unfortunately, it is also a time when thefts, and identity thefts in particular, increase dramatically. Individuals can take several precautions to avoid becoming a victim of identity-theft scams, where an individual's personal information is obtained and used to open fake credit card or bank accounts for the purpose of fraud.

General Information

- *Identity theft and various schemes associated with it are violations of both federal and state laws.*
- *The Federal Trade Commission (FTC) is the lead federal agency responsible for processing complaints by victims.*
- *Information needed to impersonate someone includes Social Security numbers, dates of birth, bank account numbers, place of employment, etc.*
- *All this information can be obtained via telephone calls or e-mails where the caller/sender poses as a legitimate entity and uses a ruse to get you to disclose it.*
- *These solicitations often appear to be from well-known businesses such as banks, internet shopping sites, or consumer survey companies.*
- *REMEMBER - If something sounds too good to be true, it probably is.*

Prevention

The Department of Justice uses the acronym SCAM to outline some common-sense preventative measures:

S = Be STINGY about giving out personal information on yourself or family members, especially via e-mail or phone. A red flag should be raised when a solicitor asks for information like account numbers or Social Security numbers — If he or she were really from the bank or credit card company the representative would have that information already. Carefully shred documents containing sensitive information.

C = CHECK your financial accounts carefully and immediately inquire about unusual activity such as unfamiliar purchases, changes of address, new accounts being opened, etc.

A = Periodically ASK for a copy of your credit report, which will show any wrongfully opened accounts in your name. Free credit reports are now available at https://www.annualcreditreport.com/cra/index.jsp .

M = MAINTAIN careful records of your banking and financial accounts. Debit transactions should be retained for five years and monthly statements for one year.

Reporting

You can do everything right and still become a victim. If it happens, you should:

- *Report incidents to the FTC at 1-877-ID THEFT (877-438-4338) and to your local police precinct.*
- *Contact the fraud unit of the three major credit-reporting companies: Equifax at 800-525-6285, Experian at 888-397-3742, and Trans Union at 800-680-7289*
- *Contact all creditors with whom your name/data were fraudulently used.*
- *Contact all financial institutions affected by the fraudulent activity.*

Also, contact the Safeguards & Security Division for more information on preventing or reporting identity theft/fraud.

Give to Help Domestic Violence Victims

The Police group is once again collecting items for Suffolk County Coalition Against Domestic Violence. Urgently needed are: coats, women's business attire, children's clothes, toiletries, phone cards, toys, diapers, etc. Items can be dropped off at any time at Police Headquarters in Bldg. 50, or to an officer at the main or north gates. Checks can also be made out directly to the Suffolk County Coalition Against Domestic Violence and mailed to Kathy McNaught, Bldg. 50.

Science-Based Gifts To Buy on Site

The BNL Science Learning Center store in Bldg. 935, on the corner of East Fifth Avenue and Railroad Street, will be open for the holiday season on Fridays, 11:30 a.m.-1:30 p.m., and will stock a variety of science-based gifts for the whole family. The Science Learning Center is the new name chosen to express more accurately the focus of what used to be BNL's Science Museum, which has always been a center of science education (see story, page 1). Visit to shop and, at the same time, enjoy the exhibits, including the new stringless harp.

Gift Wrapping, 12/19-22

Love the holidays, but hate to wrap? Bring your packages to Berkner Hall lobby between 11 a.m. and 2 p.m., Monday through Thursday, December 19-22. Volunteers will cheerfully wrap your holiday gifts for a small donation to the United Way campaign. Shirt-sized boxes will be wrapped for $1; larger boxes for $2 and up. Wrapping paper donations will be gladly accepted. To donate, or to help wrap, contact Joanne Rula. Ext. 8481.

Holiday Potluck Party, 12/18

The Hospitality Committee and the Asian Pacific American Association invite all to a holiday potluck dinner in the Recreation Hall on Sunday, December 18, at 5 p.m. Santa will visit at 5:30 p.m. with gifts for children. Chicken, ham, pies, and drinks will be provided. Bring a dish to share with six people. For more information, contact Lisa Yang, 878-3937, lisayang@optonline.net.

Bake & Craft Sale, 12/20

BNL's parent-cooperative Upton Nursery School will sponsor a fundraiser bake and craft sale on Tuesday, December 20, 11:30 a.m.-2 p.m. in Berkner Hall lobby. All are invited to support the school by buying delicious cookies and more. For more information, contact Katalin Petreczky, 821-4131 or Julika@optonline.net.

CALENDAR *(continued)*

— THIS WEEKEND —

Friday, 12/16

BERA Holiday Party

7 p.m.-midnight. Three Village Inn, Stony Brook. $50/person includes open bar, reception, dinner buffet, dessert, and dancing to a DJ. Christine Carter, Ext. 5090.

Sunday, 12/18

***Hospitality, APAA Potluck Party**

5 p.m. Recreation Hall. All are invited. Meats, pies, drinks provided. Bring a dish to share with six people. Santa will visit at 5:30 p.m. with gifts for children. Lisa Yang, 878-3937.

— WEEK OF 12/19 —

Monday, 12/19

IBEW Meeting

There will be no IBEW meeting this month.

Wednesday, 12/21

410th Brookhaven Lecture

4 p.m. Berkner Hall. Physicist Peter Steinberg, Chemistry Department, will talk on "Hotter, Denser, Faster, Smaller . . . and Nearly Perfect: What's the Matter at RHIC?" All are welcome. Visitors to the Lab of age 16 or older must carry a photo ID. See story, page 1.

Friday, 12/23

Christmas Eve Half Holiday

The Lab will close at lunchtime in observance of the Christmas Eve half-holiday.

— WEEK OF 12/26 —

Monday, 12/26

Lab Closed

The Lab will be closed in observance of the Christmas Day holiday. No Bulletin this week.

— WEEK OF 1/16 —

Wednesday, 1/18

411th Brookhaven Lecture

4 p.m. Berkner Hall. Lisa Miller of the National Synchrotron Light Source Department will talk on "Metal Ions and Protein Structure in Neurological Protein-Folding Diseases."

Friday, 1/20

***Dance Social With Live Band**

7 p.m.-12 a.m. See page 4.

Saturday, 1/21

***Hammer of the Gods Concert**

7:30 p.m. Berkner. See page 4.

Bulletin Holiday

The holiday issue of The Bulletin will be printed next Friday, December 23. There will be no Bulletin on Friday, December 30, 2005, or Friday, January 6, 2006, as the Lab will be closed on one day during each of those weeks. Bulletin production will return to its normal weekly schedule on Friday, January 13, 2006.

Arrivals & Departures

— Arrivals —

Theresa Barcelo ..... SSD

— Departures —

None

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

The following positions have been exempted from the freeze by the Deputy Director:

LABORATORY RECRUITMENT – Opportunities for Laboratory employees.

NS2197. FIREFIGHTER/EMT (two positions) – Requires five years' progressive experience in a fire department, qualifications as a motor pump operator on a Class A pumper; and possession of a current NYS EMT-D certificate. In descending order of importance, the following criteria will be used for selection: certified OSHA Hazardous Material Technician; Certified in Confined Space Rescue; current line officer in home department; and possession of an associate degree or higher in fire protection technology. Must be willing to work shifts at the completion of training period. Emergency Services Division.

TB3235. PROJECT ENGINEER I (P-9, reposting) — Requires a bachelor's degree in mechanical engineering, an advanced degree in engineering is highly desirable, and a minimum of ten years of experience in designing and analyzing components such as those used in particle accelerators and/or beam lines. In addition, proficiency with FEA software such as ANSYS is required. Registration as a NYS Professional Engineer is desirable. Will be expected to perform engineering, structural, and thermal analyses. National Synchrotron Light Source Department.

OPEN RECRUITMENT – Opportunities for Laboratory employees and outside candidates

MK3672. POSTDOCTORAL RESEARCH ASSOCIATE – Requires a Ph.D. in biophysics, biochemistry, or related field, strong background in structural biology along with experience in protein biochemistry and crystallography. Must be willing to learn cryo-electron microscopy (cryo-EM). This work will involve structural studies of two related large protein complexes that are involved in bacterial surface adhesion secretion and bacterial pilus biogenesis using x-ray crystallography and cryo-EM. Cryo-EM is suited to study large protein machines at medium resolution without the need for crystallization, and plays an increasing important role in contemporary molecular and cellular biology. In addition to computation and protein biochemistry facilities, other major instruments available include the protein crystallography beam lines of the National Synchrotron Light Source that are managed by staff members of the Biology Department, JEOL-1200EX and the state-of-the-art JEOL 2010F cryo-electron microscopes. Under the direction of H. Li, Biology Department.

MK3427. POSTDOCTORAL RESEARCH ASSOCIATE – Requires a Ph.D. in material science, chemistry, physics, or related discipline; experience with microlab and/or microscopy experience is preferred. Will work on the synthesis of nanotubes and/or nanowires and their applications in one of these fields: gas sorption, nanofluidics, fuel cell, solar cell, catalyst. Under the direction of W. Han. Center for Functional Nanomaterials.

MK3572. RIKEN FELLOW – RIKEN is a research center focusing on the physics program of the Relativistic Heavy Ion Collider (RHIC), hard QCD/spin physics, lattice QCD, and relativistic heavy ion physics, which has been established by the Institute of Physical & Chemical Research, Japan (RIKEN) at Brookhaven National Laboratory. An experimental division on spin physics was established in 1998. RHIC is the first polarized proton collider, beginning in 2001, and the Center is playing a major role in developing the RHIC spin program. The group has six members at this time, five Fellows and one Research Associate. Members of the experimental division of the Center participate on the PHENIX experiment at RHIC. Physics Department.

NS3523. ADVANCED APPLICATIONS ENGINEER (I-7, term appointment) – Requires an advanced degree in computer science or physical science with at least four years' experience in scientific computing. Requires knowledge of python, C++, Linux, distributed computing and relational databases. Background in high energy or nuclear physics an asset .Experience developing distributed processing and/or data management systems an asset. Experience in the collaborative development of large scientific software systems preferred. Will participate in the development and support of distributed processing systems supporting large-scale production and physics analysis for the ATLAS experiment. Physics Applications Software Group/Physics Department.

NS3524. ADVANCED APPLICATIONS ENGINEER (I-7, term appointment) – Requires an advanced degree in computer science or physical science with at least four years' experience in scientific computing. Requires knowledge of C++, Linux, and scripting languages. Experience in working collaboratively on large projects preferred; ability to work in this environment and interest and aptitude in user support is essential. Background in high energy or nuclear physics an asset. Will participate in the development and support of software infrastructure and tools used by physicists of the ATLAS experiment in software development and physics analysis. Physics Applications Software Group/Physics Department.

TB3656. VETERINARY SERVICES ASSOCIATE (CW-2, part-time, 50 percent, term) - Requires two years' related experience and the ability to lift 50-lb. feed bags and work weekend/holiday hours. Under direct supervision, performs tasks connected with the care, feeding, cleaning, treatment and bedding of laboratory animals. Performs general cleaning of quarters and similar duties as assigned. Medical Department.

NS2897. STAFF SPECIALIST/COUNTERINTELLIGENCE OFFICER (A-6) – Requires at least five years' experience in intelligence or counterintelligence investigations at the Federal, state, or local government level and a bachelor's degree in an appropriate field. Expert knowledge regarding the principles and concepts of the conduct of administrative investigations regarding allegations of a CI or CT nature, including those related to espionage matters, required. Requires professional mastery of investigative techniques; effective writing, speaking, and organizational skills, and knowledge of U.S. intelligence operations. Knowledge of CI and operational tradecraft to ensure an ability to carry out the duties of the position and to support the FBI and Intelligence Community required. Experience developing and conducting training and briefing programs necessary.Job duties require frequent travel for conferences, training and other business-related activities. Must successfully complete a rigid background check to include a limited-scope polygraph examination concerning National Security issues. U.S. citizenship and the ability to obtain and maintain DOE "Q" and "SCI" Access Authorization required. Counterintelligence Office.

Motor Vehicles & Supplies

04 CROSSROADS CRUISER - 30' trailer, dbl. slide, qu. br, lg. bath, bunks, storage, excel., used 5 times. $21,500/neg. 924-0139.

02 JEEP WRANGLER SAHARA - Hard top, new soft top & vinyl windows, ext. warr. incl. Mint. 49K mi. $25,000. A.J., 287-1681.

00 MAZDA MILLENIA - 6-cyl., a/t, p/s, p/b, abs, p/w, pwr. m/roof, heated seats, loaded, 91K mi. $8,000/neg. Ext. 3202 or 790-3377.

99 BMW 328I - 5-spd, cd changer, premium pkg., black w/gray int. 164K mi. $7,500. Mary-Faith, Ext. 3179 or 749-3244.

98 FORD TAURUS - SE Sedan, air bags, p/l, p/s, p/w, a/c. c/c, abs, am/fm/cass., 4-dr., 87K mi. $4,300/neg. 344-1001, afischer@bnl.gov.

98 INFINITI I30 - excel. cond., blk., tan int., 6-cyl, 4-dr, a/c, am/fm/cd, abs, a/t, c/c, all pwr. 110K mi. $6,500/neg. Ext. 6344 or 384-9009.

95 MITSUBISHI ECLIPSE RS - 2-dr, a/c, a/t, cd, m/rf, new tmg. belt, tires, batt, brkes., NYS insp. 166K mi., $1,850/neg. (925) 586-3089.

94 PONTIAC FIREBIRD - Must sell, 6-cyl, white, T-tops, new batt., stereo & tires. 101K mi. $2,000. Mark, Ext. 2238 or 828-6459.

69 CHEVROLET CORVETTE - blue, a/c, a/t, 350, T-tops, am/fm/cd, mech. excel., clean, good body. $18,000/neg. 325-9671.

Furnishings & Appliances

BASSINET - Grago, bedside, used for only a few weeks, excel. cond., pics avail. $25. 868-0786, or kanecomp@optonline.net.

CABINETS & COUNTERTOPS - kit., vanity cabinets, granite and Corian countertops, must go, best offer. Paula, 924-0139.

COUCH & LOVESEAT - excel. cond., 5 yrs. old, multi-color, ask $150. Barbara, Ext. 3431.

DINING SET - oak dining table w/2 leaves & 6 chairs, excel. cond., $450. 821-3822.

FREEZER - Westinghouse, white, textured finish, 13.3 cu. ft. inside, 55hx27dx28w. v.g. cond. $50. Kenneth, Ext. 8463 or 878-7655.

FURNITURE - 5-year-old hunter green sofa, love seat w/matched coffee table & 2 end tables, ask $600 neg. Mei, Ext. 3397.

HIGH CHAIR - for baby, used 1 time. excel. cond. $40. Mary, Ext. 3670.

SOFA & LOVESEAT - Plush hunter green, great condition. Call for photos. $200/OBO. Diane, Ext. 8122.

TANNING BED - Phoenix Sun, whole body w/face, professional bed, perfect for home. Paula, 924-0139.

Audio, Video & Computers

COMPUTER - 500 MHz Celeron processor, 256 MB SDRam, 17" CRT mon. Win XP, Office 97. $100 obo. Daniel, Ext. 2121.

KAWAI K1R SYNTHESIZER - classic MIDI module, will complement any setup, orig. pwr. adapter & user manul., $85. Ext. 3621.

MS OFFICE XP - V2002, new, sealed, Word, Excel, Outlook, Publisher, Small Business Tool, pd. $130, best offer. Don, Ext. 7237.

SPEAKERS - Infinity IL50, hardly used, paid $1,500, ask $700. Mary, Ext. 3670.

VIDEOS - Civil War Journal by the History Channel, brand new in box/shrink wrap. 4-tape set, $20 firm. Kathleen, Ext. 3926.

WINDOWS XP UPGRADE - Brand new in box, for Windows 98, 98 2nd edition or Millenium users. $75. Kathleen, Ext. 3926.

Sports, Hobbies & Pets

CROSSBOW EXERCISER - Bowflex lookalike. 400 lbs of pwr rods, like new, cost $800 sell $300. Ken, Ext. 3124 or kjones@bnl.gov.

GERMAN SHEPHERD FOR ADOPTION - well trained, lovable dog, good w/kids and other dogs. Scott, 765-4944.

ISLANDER TICKETS - Select games avail. at discount, Sec 205 Row E - face value $120, your cost $81 per ticket. 698-3543.

JEWELRY - Crystal & glass jewelry, one-of-a-kind, casual to elegant, starting at $38/necklaces, $20/bracelets. 291-2039.

NORDIC TRACK PRO - ski and arm exerciser, like new, paid $600, sell for $200. Ken, Ext. 3124 or kjones@bnl.gov.

PETSITTING - take care your pet during Christmas holiday if you are on vacation, small dogs pref. Fan, Ext. 4353.

T-SHIRTS - never worn, collectible, baseball, football, basketball, sizes XL-XXL, great gift idea, $10/ea. Michael, Ext. 1388.

Tools, House & Garden

SNOW PLOW - for Sears Cr/man lawn tractors. 42"w x14." Wheel wghts & chains incl. $150. Kenneth, Ext. 8463 or 878-7655.

STOVE - wood burning, airtight, $200. Wayne, Ext. 3256 or 631 909-2707.

Miscellaneous

CAR SEAT BASE - any Graco infant car seat will fit into this base, new and in box, paid $45, sell for $30. 581-7656.

ELECTRIC HEATERS - Honeywell Basebrd. 1000/1500W w/t/stat; Patton Convection Rm Htr 500/1000/1500W. $35. ea. Ext. 3217.

JACKETS: - leather, men's & women's, diff. colors, styles; vests & some suede too, many never worn. $5-$35. Peter, Ext. 2913.

MISC. ITEMS - 150 lb wght. set/bench $80; bakers rack $35; car booster seat $20; boys 20" bike (needs chain) $25. 387-5629.

NEW ORLEANS TO NY TRIP - $100 for you to tote puppy from NO to NY post-Xmas. Pet Carry-On provided. Ext. 8122.

WOOD-BURNING STOVE - VT castings, Aspen model 1920, 18,000 Btu, heat shields, 1 yr. old, pd. $700, sell for $500. 588-7989.

Farewell Gathering

TOM CLIFFORD - Andrew's By The Pond, Wdg. River, 12/29, 6-9 p.m., $30/pp for dinner, gift, RSVP by 12/22. Robert, Ext. 2516.

Wanted

BUNK BED - Lkg. for wood twin bunk/loft bed w/drawers. Should be well built, good cond, reasonable. Mary Anne, Ext. 2295.

DONATIONS - Police Drive for SC Coalition Against Domestic Violence. Coats, clothing, toiletries, toys. Drop at HQ. Kathy, Ext. 2238.

TV - free or v. cheap w/video input. Ext. 3621.

Lost & Found

FOUND: WATCH - Timex wrist watch at parking lot of Apartment 24. Call Sam, Ext. 1064, between 1 & 3 p.m.

For Rent

CALVERTON - 1 bdrm, bsmt. w/lg glass dr. entry, l/r, kt w/pantry, lots of cab, full bath, f/p, storage. Util/cable incl. No pets/smkg. 1 mo. sec. $900/mo. Ext. 4980 or 727-5646.

EAST MORICHES - just painted, 1 bdrm., l/r, eik, Florida rm., xtr. stor., use w/d, off-str. pkg., fire alarm syst., walk to bay, school. $900/mo. Anna, Ext. 4979 or 513-6688.

FARMINGVILLE - One bdrm ground floor apt., includes own heat control, cable, cent. a/c, utilities, no smoking/pets $850/mo. Thomas, Ext. 4866 or 846-8749.

MEDFORD - Spacious, sunny lg. 1 bdrm., lg. l/r, eik, w/d, d/w, new carpet. 2nd fl. pvt. ent., incl. all except elec., minutes to Lab. $1,100/mo./neg. Barbara, Ext. 6047.

PATCHOGUE - 2-bdrm. house, w/d, new carpets & paint, 1 mo. sec., no smkg., 15 min. to Lab. $1,400/mo. 289-9727.

PORT JEFFERSON - Short term rental? Beautiful, fully furnished apt. avail., rent month to month. $1,000/mo. Andrew, Ext. 3017 or 516-697-5943.

REMSENBURG - 2 bdrm., quiet neighborhood. Nice yard, garage, washer, dryer. $1,700. Security & ref. req. 325-0567.

ROCKY POINT - 1 sm. bdrm. apt., priv., heat incl., no pets, 5 min. to BNL. $850/mo. Trudy, 821-8730.

ROCKY POINT - One-bdrm apt. Ground level. $700/mo. inclusive. 744-2860.

For Sale

ARUBA - Marriott time share, ocean view, 2 bdrm., 2 bath, d/r, kit. $16,000/neg. 467-5853.

EASTPORT, NY - 4 bdrm., 1 bath on 1/2 acre, stainless appliances, d/r, patio, close to school, water and town. $510,000/neg. Susan, 325-9671.

On-Site Service Station

TIP OF THE MONTH: As cold weather approaches, batteries are subject to failure. An original battery in a 2001 or older vehicle may need to be changed. You may have your battery tested at the on-site station. Should you need a new one, the station carries a complete line of Delco Professional series batteries. Ext. 4034.

Services

BNLers list a wide range of services available, from home cleaning, to cake-baking, carpet-cleaning, child-care, computer servicing, home improvement, pet-sitting, tax-preparing, tutoring, word-processing and much more. To see a full list of services from on site go to http://intranet.bnl.gov/ads/displayAdsAll.asp. From off site, e-mail gvbennett@bnl.gov to request an e-mailed copy, or call 344-2345 for a paper copy to be mailed to your building or your home.

Hammer of the Gods in Concert, 1/21

The rock band Hammer of the Gods will appear in concert on Saturday, January 21, at 7:30 p.m. in Berkner Hall. Presented by the BNL Music Club, the concert will feature the music of Led Zeppelin, the rock band that became famous in the 1970s. The concert is open to the public. All visitors to the Lab age 16 and over must bring a photo ID.

Hammer of the Gods takes their audience back in time to recreate the look, feel, sound, and excitement of a live Led Zeppelin show. *Good Times Magazine* recently called the band "nothing short of spectacular." The band — a foursome consisting of guitar, vocals, drums and bass — was formed in 2002, and, since then, they have been selling out shows all across the Northeast.

Tickets cost $20 per person and can be purchased at the BERA Store, weekdays, 9 a.m.-3 p.m., or online at www.ticketweb.com. Call Ext. 5257 for information.

Dance Social, 1/20

The 20-piece "Bill Wilkinson, His Band and Singers" will perform during a dance social at the North Ballroom of the Brookhaven Center on Friday, January 20, 8-11 p.m. A one-hour beginner dance lesson in East Coast Swing will be given, 7-8 p.m.; and after the performance, enjoy an extra hour of DJ music until midnight. Sponsored by the BNL Social & Cultural (S&C) Club, the event is open to the public. All visitors to the Lab age 16 and over must bring a photo ID.

Tickets cost $15 each in advance, $20 at the door; buy them at the BERA Store, Berkner Hall, or at the BNL S&C Club's Friday night dance socials at the Brookhaven Center. Members of Brookhaven's Association for Students And Postdocs (ASAP) are offered a 50 percent discount. Contact Rudy Alforque, Ext. 4733, or rudy@bnl.gov for more information.

Here Comes Santa Claus!

For the 23rd consecutive year, Santa Claus (who, this year, doubles as Firefighter Al Licata when he is not out on his sleigh delivering presents) and his Elf (Firefighter Frank Palmeri, Jr.) will be coming to Upton town to wish everyone happy holidays and to distribute candy canes along with good cheer, compliments of the Fire/Rescue Group of the Emergency Services Division.

On Friday, December 23, using Fire Engine #1 as their sleigh, Santa and his elf will make their rounds of BNL's offices, labs, and shops from 9 a.m. to noon. To make your reservation to have Santa and his merry crew visit your workplace at a specified time, call the North Pole, Ext. 2351.

Michael Herbert CN1-11-00

the Bulletin

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