

Distinguished Scientist Emeritus Ernest Courant Honored by University of Rochester

The University of Rochester, where BNL's Distinguished Scientist Emeritus Ernest Courant earned his Ph.D. in 1943, will honor him with the Rochester Distinguished Scholar Medal at this year's commencement ceremony, to be held tomorrow, May 19. The University issued the following press release citing Courant and his work:

All scientists who work in particle physics today owe a debt to Ernest Courant. His groundbreaking scholarship has changed the way we think about and understand the structure of the universe.

One of the trio of researchers who originated the idea of "strong focusing" accelerators, Professor Courant is one of the founding fathers of modern high-energy particle physics. Thanks to Professor Courant's breakthrough in developing the first high-energy, strong focusing accelerator—and the particle accelerators that have followed since—physicists have been able to peek inside individual atoms to understand the fundamental structure of matter, the forces holding it together, and the origins of the universe.

Professor Courant's many honors include the Enrico Fermi Award from the Department of Energy, the Robert R. Wilson Prize of the American Physical Society, and the Boris Pregel Prize of the New York Academy of Sciences. A member of the National Academy of Sciences, he continues to consult at Brookhaven National Laboratory, where he holds the position of distinguished scientist emeritus.

An innovative scholar and researcher, Ernest Courant has an exemplary record of scientific exploration and discovery. For his many contributions to physics and for his dedication to the ideals of scholarship and teaching, we are proud to present to him Rochester's Distinguished Scholar Medal.



Roger Stoutenburg D0230500

At BNL, Courant joined the Proton Synchrotron Division as an associate scientist in June 1948. By 1955 he was a physicist with tenure, and in 1960, a senior scientist in the Physics Department. During his years at BNL, he also held many professorship positions at Stony Brook University. His seminal contributions continued to support and enliven BNL's accelerator physics efforts even after his retirement in December 1989, when he was named Distinguished Scientist Emeritus and retained as a consultant to the present. Not least appreciated among his contributions was the now well-known name he gave to a complicated new accelerator device. To maintain a quality of the beam called polarization, a specialized string of magnets was invented by scientists at Novosibirsk, Russia — it was Courant who dubbed the string a "Siberian Snake." — Liz Seubert
Note: See related inside story "Then & Now: Focus on Strong Focusing."

Lawrence M. Krauss to Give BSA Distinguished Lecture, 5/30 'Einstein's Biggest Blunder: A Cosmic Mystery Story'

Lawrence M. Krauss, Ambrose Swasey Professor of Physics and Astronomy at Case Western University, will give a BSA Distinguished Lecture titled "Einstein's Biggest Blunder: A Cosmic Mystery Story," on Wednesday, May 30, at 7 p.m. in Berkner Hall. BSA Distinguished Lectures are sponsored by Brookhaven Science Associates, the company that manages BNL, to bring topics of general interest to the Lab community and the public. The lecture is free and open to the public. Visitors to the Lab age 16 and over must bring a photo ID.

In 1915, Albert Einstein completed the General Theory of

Relativity, the groundbreaking theory that laid the foundation for understanding the motion of objects in the universe as well as the motion of the universe itself. In 1916, Einstein added an additional piece to his equations, called the cosmological constant, to account for what he thought was a static universe. About a decade later, however, after it was discovered that the universe was expanding, Einstein called this addition to his theory his "biggest blunder."

Since the 1990s, new observations have led to a revolution in cosmology. The standard model of cosmology built up over 20 years is no longer accepted as accurate. New data suggest that most of the energy density of the universe may be contained in empty space. Remarkably, this is exactly what would be expected if Einstein's cosmological constant really exists. If it does, its origin is the biggest mystery in physics and presents huge challenges for the fundamental theories of elementary particles and fields. Krauss will explain Einstein's concept and describe its possible implications.

Lawrence Krauss is an internationally known theoretical physicist whose studies include the early universe, the nature of dark matter, general relativity and neutrino astrophysics. Born in New York City, Krauss grew up in Toronto, Canada, and he received undergraduate degrees in both mathematics and physics at Carleton University in Canada. He earned a Ph.D. in physics from the Massachusetts Institute of Technology in 1982, then joined the Harvard Society of Fellows. He became a professor in physics and astronomy at Yale University in 1985, and he moved to Case Western University in 1993, where he was named the Ambrose Swasey Professor of Physics, Professor of Astronomy, and Chair of the Department of Physics. In 2002, he became Case Western's Director of the Center for Education and Research in Cosmology and Astrophysics.

The author of over 200 scientific publications as well as numerous popular articles on physics and astronomy, Krauss has also written six popular books, including the international best seller, *The Physics of Star Trek* and the award-winning *Atom: A Single Oxygen Atom's Odyssey from the Big Bang to Life on Earth...and Beyond*. He also writes frequently for *The New York Times* and appears regularly on radio and television. Krauss has received numerous prestigious awards for his research, writing and lecturing. He is a Fellow of the American Physical Society and the American Association for the Advancement of Science.

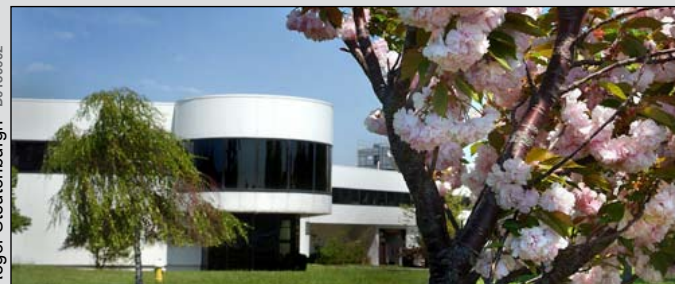
— Diane Greenberg



All Are Welcome to Attend

CFN Ribbon Cutting Ceremony
5/21, 11 a.m.

A Highlight of the 2007 Joint NSLS/CFN Users' Meeting, 5/21-23



Roger Stoutenburg D0180602

The 2007 Joint National Synchrotron Light Source (NSLS) and Center for Functional Nanomaterials (CFN) Users' Meeting will be held at Berkner Hall from Monday, May 21 through Wednesday, May 23. The meeting is a forum for reporting new research results and advances in experimental capabilities that utilize synchrotron radiation and highlight nanoscience. The event is hosted and sponsored by the NSLS Users' Association, the CFN Users' Association, and external organizations representing the users of the NSLS and the CFN.

The BNL community is invited to attend the free plenary session on Monday morning, May 21, 8:30-10:40 a.m., as well as the CFN Ribbon Cutting Ceremony immediately following, at 11 a.m. Speakers include DOE's Associate Director of Science for Basic Energy Sciences (BES) Pat Dehmer, BNL Director Sam Aronson, BNL's Associate Lab Director for Light Sources Steve Dierker, and NSLS Department Chair Chi-Chang Kao. Updates will be given on BNL, BES, NSLS, NSLS-II, and the CFN. While the plenary session is free, the planning committee requests that anyone planning to attend should register at www.nsls.bnl.gov/users/meeting/2007/registration/registration.asp.



Joseph Rubino D0790307

NSLS User Group Finding: Zinc May Play Role in Eye Disease

At the National Synchrotron Light Source (NSLS), a team of researchers has discovered that the mineral zinc may play a role in the development of age-related macular degeneration (AMD), which affects the eye's retina and causes loss of central vision. AMD is the leading cause of blindness among elderly people in the developed world.

Led by Imre Lengyel, of University College of London, the research team included Jane Flinn, David Linkous, and Katherine Cano, all of George Mason University; Tunde Peto from Moorfields Eye Hospital, London; Alan Bird, University College of London; Antonio Lanzirrotti, University of Chicago; Christopher Frederickson, NeuroBioTex, Inc.; and Frederik van Kuijk, University of Texas Medical Branch. Their research was supported by DOE, the Hungarian National Science Fund (OTKA), Moorfields Eye Hospital Special Trustees, Fight for Sight, and Wilkins AMD fund.

One of the hallmarks of AMD is the accumulation of protein and lipid-rich deposits in a part of the eye called Bruch's membrane. The underlying mechanisms of this deposit formation are not clear, but because zinc is known to contribute to deposit formation in neurodegenerative diseases such as Alzheimer's disease, the researchers decided to explore the role zinc might play in AMD.

Using a technique called x-ray fluorescence mapping, at NSLS beamlines X26A and X27A, the group measured the concentration of zinc in nine post-mortem human eyes with AMD. The results, published in the April 2007 edition of *Experimental Eye Research*, show unexpectedly high levels of zinc in the deposits, indicating that the mineral might indeed contribute to the development and progression of AMD.

To read the BBC News article about the research, go to <http://news.bbc.co.uk/2/hi/health/6457427.stm>. — Kendra Snyder

See Stories Inside

CFN Facts & Floor Plan
Nanoscience 101: Q&As
Then & Now: Strong Focusing

Nanoscience 101

This Monday, May 21, the BNL community will celebrate the dedication of its new Center for Functional Nanomaterials (CFN). Science and technology based on nanoscience is expected to be revolutionary, and could lead to groundbreaking advances in the design and fabrication of a wide range of products - from automobile tires, to vaccines, to computer chips, to objects not yet even imagined.

Below is the second in a series of questions and answers to help familiarize members of the BNL community with nanoscience in general, the types of research planned at the CFN, and health and safety aspects of CFN operations.

Q: Why is BNL interested in nanoscience and nanotechnology?

A: Brookhaven’s CFN is one of five DOE Office of Science nanoscale research centers. These facilities are designed to be the nation’s premier user centers for interdisciplinary research at the nanoscale, serving as the basis for a national program that encompasses new science, new tools, and new computing capabilities.

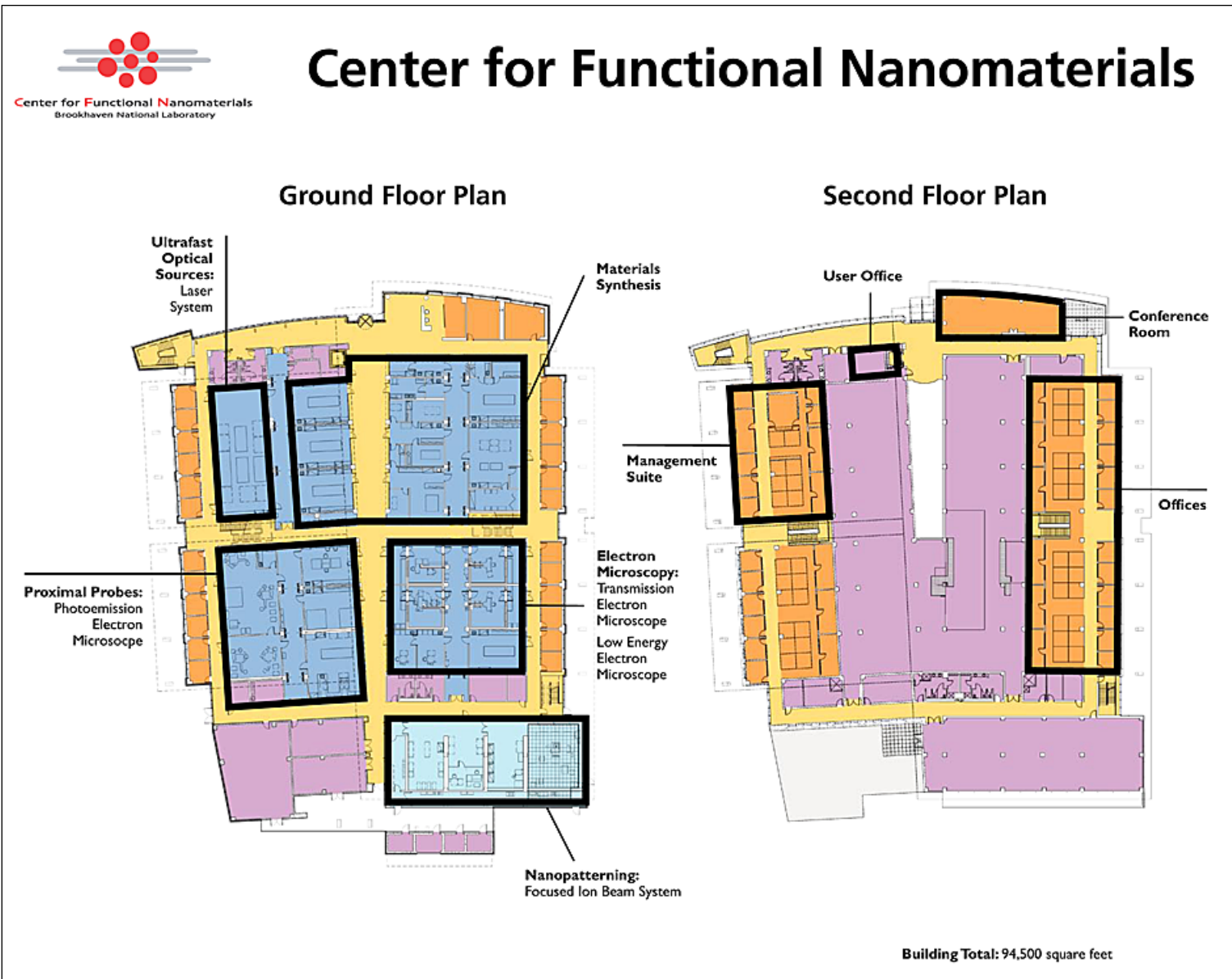
Government support for basic research and development in its early stages is required in order to realize nanotechnology’s full potential and to keep the U.S. a leader in this field. Nanostructured materials and devices will enable new research directions and the potential for unprecedented advances in many areas, including hydrogen-storage materials and fuel cells to decrease U.S. dependence on petroleum-based fuels; new medical imaging and treatments; and cleaner and more efficient energy generation and storage.

Q: Where did nanotechnology come from, and how long has it been around?

A: Nanostructured materials are not new. For example, the red and yellow hues in colored glass dating from Roman and medieval times result from the presence of nanometer-diameter gold and silver particles in the glass. However, the ability to probe, manipulate, understand, and engineer matter at atomic scales has only recently come within our grasp. New machines and tools are continually being developed that allow researchers to advance the frontiers of nanoscience.

Q: What unique capabilities does BNL have in this new frontier?

A: Along with the CFN, the Lab is the home of the National Synchrotron Light Source (NSLS), and is expected to be the site for NSLS-II. These facilities will allow researchers to study nanomaterials created at the CFN in incredible detail, helping to define their structure and function. Once the NSLS-II is operational, researchers from the U.S. and elsewhere will have access to two facilities whose complementary nature makes them unique in the world.



CFN Building Design
Specialized Facilities for the Study of Nanoscience

The Center for Functional Nanomaterials (CFN) at Brookhaven National Laboratory provides state-of-the-art capabilities for the fabrication and study of nanoscale materials, with an emphasis on atomic-level tailoring to achieve desired properties and functions.

High-tech tools

The CFN, a 94,500 square foot facility, will house some of the world’s most intricate and complicated scientific tools, including a Scanning Transmission Electron Microscope (STEM), a Low Energy Electron Microscope (LEEM), a proximal nanoprobe, and an electron beam lithography laboratory — all of which will enhance research in the areas of nanocatalysis, the study of biological and electronic nanomaterials, and theory and computation. These tools and other major equipment totaling \$25 million will be installed at the CFN during 2007.

Design characteristics

To ensure optimal performance, the CFN has some built-in design characteristics. For instance, because the mere

existence of body heat can affect the ambient conditions in the STEM lab, controls there are adjustable to 0.1 degrees Celsius for temperature and within 5 percent for humidity.

Additionally, the STEM is so sensitive to vibration that vehicles driving on nearby roadways can cause interference. To help absorb noise and vibration, 24-inch isolated concrete slabs have been constructed in some specialized labs, and polypropylene fibers have been added to certain slabs to dampen the noise.

To avoid radio frequency and electronic magnet interferences, aluminum and steel shielding has been installed at the CFN. The building also has anti-static flooring, and “drop-down” utility carriages that provide the power supply to all the laboratories. A similar system exists for vacuum and compressed air.

The building also houses 5,000 square feet of “clean room areas,” which have mechanical space with dedicated air handling units to filter the air and keep air particulates to very low levels. Sixty-two of-

fices and 40 cubicles provide workspace for scientists and support staff.

Green building

The CFN has been registered with the United States Green Building Council as a LEED building, for Leadership in Energy and Environmental Design. LEED is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings, which offers building owners and operators the tools they need to have an immediate and measurable impact on their buildings’ performance. LEED promotes performance in five areas of human and environmental health: sustainable site development (such as erosion control and storm-water management), water savings, energy efficiency, materials selection, and indoor environmental quality.

The CFN will meet all of the LEED requirements, including state-of-the-art heating and ventilation equipment, roofing materials designed for energy conservation, and noise and vibration-sensitive concrete slabs.

Building Statistics
And Features:

- Total of 94,500 square feet
- Designated LEED Building
- Vibration & noise-controlled research areas
- Anti-static flooring in lab areas
- Use of aluminum and steel shielding in the main electrical switch gear room and service galleries
- Wet and dry lab areas
- 5,000 square feet of clean rooms with dedicated air-handlers
- Utility galleries
- 62 offices, 40 cubicles

Sponsor:

U.S. Department of Energy’s Office of Basic Energy Sciences

Funding:

\$81 million for construction and major equipment
\$19 million annually for operations

Users:

An estimated 300 annually from academia, industry, and national laboratories

www.cfn.bnl.gov

Scharff-Goldhaber Prize Ceremony, 5/25

Stony Brook University (SBU) and the Lab communities are invited to attend the award ceremony and reception for the 2007 Gertrude Scharff-Goldhaber Prize won by Manuela Kulaxizi, SBU graduate student, on Friday, May 25, at 3 p.m., in the Large Seminar Room of the Physics Department, Bldg. 510. Kulaxizi will give a short seminar on her research titled “Gauge theories, gravity and noncommutative geometry.” Refreshments will follow the presentation.

LIANS Dinner Meeting, 5/31

The next meeting of the Long Island Chapter of the American Nuclear Society (LIANS) will be held on Thursday, May 31, when Mark Davis of BNL’s Environmental & Waste Management Services Division will talk on “Wampmissic: From Mid-1800 to Big Science.” The meeting will be held at the South Shore Restaurant, Rte. 112, Patchogue. Complimentary appetizers/cash bar will start at 6 p.m., dinner at 7 p.m., and Davis’s talk at 8 p.m. The cost is \$25/person. Reserve by Monday, May 28, leaving a message with Arnie Aronson, Ext. 2606.

Employee Lunchtime Tour
Come Birding, Today, 5/18

Today, May 18, Ernie Lewis of the Environmental Sciences Department will lead another birding expedition to the far reaches of the BNL fields and meadows. To participate, meet at the upper lobby of Berkner Hall at noon to be taken by Lab vans to the walk location. Maybe you will see a male belted kingfisher like the one at right, photographed a week or so ago by Lab Photographer Roger Stoutenburgh. The group will be returned to Berkner by 1 p.m. Call Elaine Lowenstein, Ext. 2400.



Roger Stoutenburgh 00160407

Then & Now — Focus on Strong Focusing



Gathered around a quarter-scale model of the Cosmotron magnet are the co-discoverers of strong focusing at BNL: (from left) Ernest Courant, M. Stanley Livingston, and Hartland Snyder. Livingston holds a cardboard cutout of a quarter-scale strong focusing magnet to show the great reduction in size possible with strong focusing. At right is John Blewett, who, shortly after the discovery, extended the principle to linear accelerators.

Since the early 1950s, scientists have used accelerators and colliders, machines with specialized magnets that guide beams of subatomic particles or synchrotron light for experiments in all kinds of scientific exploration. Yet these machines and the life-changing information they have provided might never have existed if the countries who paid for them had decided their cost was too great. In 1950, when BNL was building one of its earliest world-class machines of discovery, the Cosmotron, the best way known to make a more powerful accelerator was to make it larger, using more and bigger magnets with larger apertures. But this would take far more steel for the magnets — for ten times more power, 100 times more steel — at prohibitive cost. Then, researchers at BNL — M. Stanley Livingston, Ernest Courant, and Hartland Snyder — made a breakthrough discovery in accelerator design: strong focusing.

Improving on the Cosmotron

On May 20, 1952, the BNL Cosmotron was the world's first accelerator to reach one billion volts (BeV), and one month later, to reach 2.3 BeV. As Robert Crease tells the story in *Making Physics*, his book of early BNL history, a delegation of accelerator scientists from a new lab in Europe, which was to be called CERN, were due in August to visit the Cosmotron before they constructed a proton synchrotron that would be similar to it, but scaled up to 10 to 20 BeV. Livingston organized a group to brainstorm for Cos-

motron design improvements that the Europeans could use in their machine.

The Cosmotron magnets were all in the shape of the letter “C,” and all facing outwards around the ring. One drawback was that above a certain energy, magnet saturation would have the effect that the beam was focused in the vertical direction, but unstable in the radial plane. Livingston asked Courant, an expert on the theory of orbit stability in accelerators, to investigate the effect of reversing some of the magnets to face inward, which would have the effect of reversing the saturation effect in half the magnets, so that it would average out to zero. Courant's calculations showed that reversing the magnets would focus the particles in the beam better than before, and that if the reversals were closely spaced, the focusing effect would be much stronger — and the strong focusing principle was born.

Establishing Strong Focusing

As Crease continues with the story, Snyder then recognized and developed an extended analogy between the way magnets focus beams of particles and the way lenses focus light beams, greatly strengthening the way the new concept could be described. The team realized that their discovery would mean that more powerful machines could be built with narrower, better focused beams of particles requiring smaller magnets with smaller apertures that would cost much less.

The CERN visitors arrived on August 4 and found BNL's ac-

celerator physicists “abuzz with excitement. On learning the news, they scrapped their idea for a 10 BeV Cosmotron scale-up and began to work on plans for a 25 to 30 BeV strongly focusing proton synchrotron. (Courant's notebooks of this time are now at the Smithsonian Institution.)”

Courant, Livingston, and Snyder mailed a paper about their discovery to *Physical Review* (PR) and John Blewett, another BNL Cosmotron accelerator physicist, sent in a paper showing how to extend the new principle to linear accelerators. Both papers appeared in PR of December 1, 1952. Later, Courant and Livingston were to be awarded DOE's Enrico Fermi Award for this discovery.

Unexpectedly, in early 1953, it was found that the idea of strong focusing had been described and patented by Nicolas Christofilos, an American-born Greek electrical engineer. His manuscript had been wrongly filed in California and remained unpublished. As Crease describes, the details of his scheme were different, but the principle was the same as the BNL discovery. The Atomic Energy Commission (AEC) followed Courant, Livingston, Snyder, and Blewett's lead in acknowledging the earlier paper, and a license agreement was reached between Christofilos and the AEC and Associated Universities, Inc., the managers of BNL. Christofilos was offered a position at BNL, and joined the Lab in March, 1953, where Courant and the other accelerator physicists had already started work on a new machine — the Alternating Gradient



Ernest Courant

Synchrotron, where countless important discoveries were to be made, garnering awards that included three Nobel Prizes.

Just a Few Benefits

Strong focusing has made possible many facilities and experiments. To name just a few: at the Lab's Relativistic Heavy Ion Collider, extraordinary discoveries about matter and how it behaved during the first instants of the universe after the Big Bang are being revealed; and further insights will be probed at the Large Hadron Collider soon to be operating at CERN, Switzerland. Crucial findings in medicine, biology, chemistry, and physics have been and are being made at BNL's National Synchrotron Light Source (see story on blindness research, page 1) and other light sources such as the Advanced Photon Source at Argonne National Laboratory. And research and development on the next-generation light source, NSLS-II, is racing toward more milestones of new knowledge.

No wonder that on May 19, 2007, Ernest Courant will be again honored for his work, this time by the University of Rochester, where he earned his Ph.D. in 1943 (see story, page 1). The “then” of this science story still provides for tremendous and exciting “now” facilities and events.

— Liz Seubert

Memorial Day Ceremony, 5/24

At noon on Thursday, May 24, around the flagpole in front of Brookhaven Center, the Brookhaven Veterans Association invites all the Lab community to attend a Memorial Day Ceremony that they will conduct to recognize the sacrifices of U.S. fallen serviceman and women.

For more information, call Don Farnam, Ext. 8248.

Join the BNL Veggie Club!

Fresh organic produce from a local Long Island farm is available, delivered weekly, for those who wish to join the Community Supported Agriculture (CSA) at BNL. For 26 weeks, June through November, a selection of freshly picked organic produce, based on what is in season, is delivered to BNL for each CSA member to pick up. The fee for a season of produce is \$405. Pay immediately or in installments of \$200 on sign-up, by May 31, with two post-dated checks: \$105 for July 10, and \$100 for September 4. For information contact Ruth Comas, comas@bnl.gov or Ext. 3545.

Inventors, Take Note

The Office of Intellectual Property & Sponsored Research has moved to Bldg. 185 on Brookhaven Avenue.

Arrivals & Departures

— Arrivals —	
None	
— Departures —	
Junliang Zhang	Chemistry
Frank Laue	Physics

CALENDAR TODAY

Friday, 5/18

*Lunchtime Tour - Bird Walk

Noon. Berkner Hall lobby. No reservations needed. See notice, page 2. Wear suitable clothes, shoes. Back at Berkner by 1 p.m.

— NEXT WEEK —

Monday, 5/21

*Joint NSLS/CFN Users' Meeting

8:30-10:40 a.m. Berkner Hall. Plenary session, all welcome. See page 1.

*CFN Ribbon Cutting

11 a.m. Center for Functional Nanoscience. All are welcome.

1:30-6 p.m. User Meeting Workshops. See www.nsls.bnl.gov/users/meeting/2007/schedule/. Registration required.

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.

Tues. - Wed. 5/22-23

*Joint NSLS/CFN Users' Meeting

Continued. See www.nsls.bnl.gov/users/meeting/2007/schedule/. Registration required.

Thursday, 5/24

*Memorial Day Ceremony

Noon. See notice below, left. All are welcome.

*Poppy Day Support Effort

Noon-1:30 p.m. Berkner Hall lobby. See notice below, left.

Friday, 5/25

*Scharff-Goldhaber Prize Ceremony

3 p.m. Large Seminar Room, Physics, Bldg. 510. See page 2.

— WEEK OF 5/28 —

Wednesday, 5/30

*BSA Distinguished Lecture

4 p.m. Berkner Hall. Lawrence Krauss will present “Einstein's Biggest Blunder? A Cosmic Mystery Story.” All are welcome. See story on page 1.

— WEEK OF 6/4 —

Monday, 6/4

*Talk on Diversity in Workplace

10 a.m.-noon. Snyder Hall, Bldg. 911A. See notice below.

Tuesday, 6/5

Retirees' Get-Together Lunch

Noon-3:30 p.m. Bellport Country Club. Brookhaven Retired Employees Association (BREA) event. To attend, send \$30 check made to BREA, to BREA, P.O. Box 5000, Bldg. 475C, Upton, NY 1193-5000. See also, 344-2707, www.brea.bnl.gov.

Support Poppy Day to Benefit Vets, 5/24

On Thursday, May 24, 11:45 a.m.-1 p.m., BNL retiree Flo O'Brien and other Leisure Knoll residents representing the American Legion will give out poppies, made by veterans, and collect donations to be used to benefit the veterans. The poppies on the Flanders battlefields in World War I have become a Memorial Day symbol of all veterans' dedication.

Talk on Diversity Education, Cultural Sharing, 6/4

On June 4, consultant Brian McNaught will give a talk focusing on differences in the workplace. All employees are invited to join the Diversity staff for this presentation, which will be held in Snyder Hall, Bldg. 911A, 10 a.m.-noon.

During his talk, McNaught will help participants to understand their role in creating a corporate culture that feels safe and welcoming

to gay, lesbian, bisexual, and transgender colleagues. This presentation underscores BNL's commitment to valuing diversity by helping the participants understand the impact of day-to-day encounters on productivity and retention, and aiding open communication and innovative approaches to maximizing productivity by minimizing conflict.

Summer Science Explorations Camp

BNL employees are invited to register their children or grandchildren of fourth-to-sixth grade for the 2007 Summer Science Explorations Program provided by the Lab's Science Learning Center (SLC). This free three-day summer camp will be held during two weeks, Tuesday through Thursday, July 10-12 and August 14-16, 8:30-11:30 a.m. Students will have a hands-on field experience in observing habitats on site and spend two days in investigating the planet Mars. These programs center on research done at the Lab. Teaching participants will include SLC science educators, research staff, and college interns. Space is limited, so register your child or grandchild early by contacting the Science Learning Center Office, Bldg. 400, Ext. 4495. Students must attend all three days of camp, and parents of participating children are welcome to attend.

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/.

LABORATORY RECRUITMENT - Opportunities for Laboratory Employees

CUSTODIAL SERVICES SUPERVISOR (T-4) Requires three years custodial experience with detailed knowledge of custodial principles, practices and equipment and experience in the use of hand power tools and small powered equipment. Excellent interpersonal, written, and verbal communication skills as well as presentation skills; group leader or foreman experience, and/or demonstrated leadership qualities with problem solving skills are necessary. Excellent organizational skills, knowledge of computers including Microsoft (Outlook, Word, Excel) software applications and a valid drivers' license required. Responsibilities include first line supervision in the Custodial Services Section of Plant Engineering which includes directing employees on jobs, including assignments, training, scheduling, grievance handling, and technical direction. Coordinates all work of the unit, maintains records and reports. Supplies technical assistance and information as required. Plant Engineering Division. tbuck@bnl.gov, refer to Position No. TB 4433.

OPEN RECRUITMENT - Opportunities for Lab employees and outside candidates.

POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. in electrochemistry, chemical engineering, mechanical engineering or chemistry. Experience in nanoparticle synthesis, electrochemical techniques, scanning tunneling microscopy, and electrochemical reactor design is desired. The focus of this position will be on the synthesis and characterization of new catalytic materials with a very low platinum content and designing new cells-reactors for synthesizing gram quantities of catalysts. Single crystal and nanoparticle surfaces of metal and alloys characterized using electrochemical techniques, scanning probes, and synchrotron radiation based techniques will be involved. Under the direction of R. Adzic, Chemistry Department. Refer to Position No. FH 4579.

POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. in physics, electrical engineering or a related discipline with emphasis on accelerator technology. Hands-on experience in the design and operation of the RF photo injector and linear accelerators and the use of diagnostics for characterization of short high brightness electron beams is desired. Knowledge of RF systems and accelerator modeling software is also desired. The successful candidate will design, participate and support experiments with electron beam and high power lasers. The experiments will be conducted at the BNL Accelerator Test Facility. Both experimental work and computer simulations will be required. Under the direction of V. Yakimenko, Physics Department. Send CV to felicia@bnl.gov, referring to Position No. FH 4572.

SCIENTIFIC STAFF POSITION - ASSISTANT (S-1) / ASSOCIATE (S-2) - Requires a Ph.D. in accelerator physics or related field. Experience in the area of (one or more) electron rings, linacs, FELs with emphasis on diagnostics/experimental research is desired. Position is with the Accelerator & Operations Division of NSLS. The successful candidate is expected to be actively involved in the accelerator and/or FEL R&D, as well as being attentive to the needs of the current operation of the NSLS facility. The level of the position will be based on the background and experience of the selected candidate. Under the direction of B. Podobedov, National Synchrotron Light Source Department. Send CV to borisp@bnl.gov, referring to Position No. KH 3263.

ELECTRICAL RF ENGINEER I (P-9) - Requires a BSEE, MSEE preferred, and at least 10 years' related experience which includes at least five years' experience working on accelerator or related RF systems. Candidate should have experience in RF measurements, RF design, and feedback controls as well as circuit simulation and system troubleshooting.

Responsibilities include research & development, maintenance, and improvements of seven RF cavities, eight high-power RF amplifier systems, and associated low-level RF controls and control systems. Will also be responsible for LINAC s-band klystron and pulsed power modulators and low-level RF controls. Must work closely with RF technicians and others in the electrical engineering group. Position is in the NSLS Electrical Section as an RF Engineer. National Synchrotron Light Source Department, sobrito@bnl.gov, referring to Position No. NS 3266.

PHYSICS ASSOCIATE I (P-8) - Requires a doctorate degree in physics and a minimum of 10 years' experience in testing and characterization of silicon detectors. The ideal candidate will have a strong background in semiconductor device physics, optics, and electronics, and will have participated in large-scale testing programs for detector instrumentation at a major experimental facility. Must be able to develop apparatus and methods for making detailed measurements of optical, electrical, and mechanical characteristics of advanced silicon sensors for the LSST project. Ability to work with programmable test equipment (GPIB, RS-232, USB, FireWire) and to develop data analysis routines is desired. Will interact closely with Instrumentation and Physics scientists and will participate in a large collaboration team. Instrumentation Division, sobrito@bnl.gov, refer to Position No. NS 2077.

REFRIGERATION & AIR CONDITIONING ENGINEER (LG-10) Under minimum supervision constructs, installs, repairs, maintains and operates refrigeration, air conditioning, ventilating and auxiliary and related equipment. Will perform the same work on air compressors and vacuum pumps whether or not associated with the above equipment. Shift workers assigned to Building 600 acknowledge all Laboratory alarms in the control room and make appropriate notifications. Plant Engineering Division, tbuck@bnl.gov, refer to Position No. TB 4440.

PRINCIPAL TECHNICIAN (TW-4) Requires an AAS degree in electrical engineering technology, plus at least two years of relevant work experience including maintenance and troubleshooting of complex electronic systems such as power supplies and analog/digital electronics. Experience with Allen Bradley Programmable Logic Controllers (PLC's) and basic computer knowledge is desirable. Must be familiar with standard test and measurement equipment, such as function generators, oscilloscopes, multimeters, and spectrum analyzers. Must be able to build prototype circuits from schematic drawings, and assemble chassis, using basic mechanical fabrication techniques. Must be self-motivated, able to work under minimum supervision and be available for off hours call-ins as required. Must be flexible to cover shift work if required. Collider-Accelerator Department, tbuck@bnl.gov, refer to Position No. TB 4409.

Motor Vehicles & Supplies

04 JEEP WRANGLER X - 6 cyl, a/t, a/c, soft & hard top, cd, 4wd, vg cond. 38K mi. \$15,000/neg. 929-6421.

03 CROSSROADS CRUISER 5TH WHEEL - single slide out, 2 bdrms, dinette, sofa bed, f/glass coated ext. \$17,500/neg. 433-2673.

03 FORD EXPLORER XLT SPORT - 4dr, 4x4, a/t, 6cyl, new tires, 3rd rw seat + rr a/c, pwr & tow pkg, 46K mi. \$13,000. Ext. 4422.

03 HYUNDAI TIBURON - 6-spd man. transm., sports pkg., fully equipd, excel. cond. 30K mi. \$11,000. Ext. 5149 or 929-0961.

02 YAMAHA YZ250F - four stroke, liquid cooled, auto-decompression, v low hrs, perf cond, like new. \$2,300. Rich, Ext. 7294.

02 TOYOTA CELICA - GT, carbon blue, 2dr., 5spd, a/c, excel. cond., avail. end of Aug. 82K mi. \$9,000. Ext. 4924.

01 FORD TAURUS - V6, dual air bag, ABS, c/ c, am/fm/cd, r/rk, a/c, p/w, p/l, 3rd frt.seat+2 in trunk, wgn 67K mi. \$5,700. 655-8100.

01 HONDA PRELUDE (BASE) - 2dr, 5spd, a/c, abs, c/c, am/fm/cd, cust. int, s/roof, excel. cond. 66K mi. \$12,500/neg. Ext. 7139.

01 MERCURY SABLE - 3L, V6, a/c, am/fm/cass, abs, a/t, p/w, keyls ent., t/c, c/c, 4-a/ b, al., 105K mi. \$4,600/neg. 516 449-3821.

00 GMC PICK-UP SIERRA SLT. Z71 - 5.3L, V8, 4Dr. Tow Pkg., ext. cab, new tires, excel. 82K mi. \$13,300/neg. 516-662-1812.

00 FOREST RIVER CHEROKEE 275B - 5th Whl trailer, vg cond, sleeps 8, big slide, \$11,000/neg. Rich, Ext. 7160 or 929-8294.

00 MERCURY ROUSH COUGAR - black, 2dr., a/t, a/c, cd., gd. cond., cust. wheels, leather. 55K mi. \$8,995. 821-7412.

98 FORD EXPEDITION XLT - 4wd, 5.4 L, 3rd seat, leather, 6 cd, loaded, (KBB val.\$8,550). 125K mi. \$7,200. Rich, Ext. 7294.

97 MAZDA 626 ES - all pwr, leather, 5spd, V6, many new parts, excel. 106 mi. \$3,000. 902-8188.

95 HONDA ACCORD LX - orig. owner, gd cond, 4dr. 134K mi. \$2,800/neg. Ext. 8355.

92 CADILAC FLEETWOOD, BROUGHAM - V-8, 5.7L, loaded, as is, some rt sde dmge, runs well. 115K mi. \$950/neg. 588-5670.

90 HONDA LX COUPE - a/t, am/fm/cass., orig. owner, dealer, serv. many new parts, runs v. well, b/o. 210K mi. 751-8403.

90 PLYMOUTH SUNDANCE - 4 dr, a/t a/c am/fm. Well maint, vg cond. 70K mi. \$800/neg. 473-3604.

89 HARLEY ULTRA CLASSIC - clean, gd. running cond. 12K mi. \$8,800. 698-4823.

87 BUICK "T" TYPE REGAL - Gd rest. proj. or for pts. Midnight blue, blue suede cloth int. 189K mi. \$3,500/neg. 878-5798.

87 SUZUKI SAVAGE - Nice running bike. 9,000 mi. \$650/neg. Billy, 834-6637.

50 FORD F100 - Fully restored, 6 cylinder. 70K mi. \$9,500. Don, 834-4829.

Boats & Marine Supplies

17' STARCRAFT FIBERGLASS - 1970 mdl v. stable, fast. 2 Evinrude mtrs, 88 HP (one spare) both run well. \$1,900/neg. 375-8519.

20' BAYLINER CAPRI - cuddy cabin, head v6 I-O w/trailer, make offer. 744-5851.

21' STEIGERCRAFT - Custom Center Pilot-house, fits 4 adults, 1987 120 HP Johnson w/rebuilt pwrhd, PT&T, \$4,500. 369-7809.

23' GRADY WHITE SEAFARER - 226 hard-top, YAMAHA 225-04 stroke 2003 dbi alx trl, loaded. \$44,900/neg. 587-7876.

23' SUNRUNNER 230SB - 84 Cruiser slps 4, galley, V-Berth, head/w shwr. Volvo/penta V-8 f/w cooled. \$7,250/neg. 278-2192.

Furnishings & Appliances

AIR CONDITIONER - 8,000 btu, used 3 seasons. Asking \$50. 581-7656.

BEDROOM - 5-pc wood, tall bureau, long bureau w/vanity mirror, qu. hdbd, nightstand. Good Cond. \$350/neg. 675-6325.

BEDROOM FURNITURE - Thomasville, whitewashed wood, \$600, excel cond. 286-3545.

BUBBLE SPA - mat & pump for stdnrd tub to create bubble "jets". Easy to use. Daisy brand, hardly used. \$20. Ext. 7114.

FLOOR BUFFER/POLISHER - Kenmore, \$20. Chris, Ext. 2094.

RANGE - Tappan, elec., self cleaning oven, almond, excel. cond., \$100. 744-5553.

SLOT MACHINE - Triple Triple Diamond (9x, 81x), actual Las Vegas casino mach. IGT. accepts qtrs/bills. \$850. Rick, Ext. 3005.

VACUUM - Shark, upright w/halogen light. perfect cond., \$60. Rick, Ext. 3005.

WASHER & DRYER - lg. hvy. duty, worked perfectly at last check, some scratches, last used summer '06. 591-2564/eves.

Audio, Video & Computers

PC & LCD(17 INCH) - PC(CPU:celeron D 2.4GHz, Mem:256MB, HDD:37GB) & LCD (17"), no OS, \$200/ng. Nobuyuki, Ext. 8088.

Sports, Hobbies & Pets

12" BOYS BIKE - Training wheels on, hardly used, bright green w/reptile theme, black tires \$25. Kelly, Ext. 4901.

BUMPER POOL TABLE - Excel cond, must sell, bought for \$180. Will take best offer. 917-225-7706.

GOLF CLUBS - 3 sets avail. w/ bags. Chris, Ext. 2094.

GUNS - priv. collection, shotguns, rifles & pistols, call for list. Bob, 587-7876.

HAMSTER CAGE - Glass w/secure screened top; water bottle, wheel, \$15. Ext. 4340.

POOL TABLE - regulation size, slate, vg cond., access. incl. \$900. 803-0103.

SILVER POCKET BIKE - \$175. Maryann, Ext. 4705 or 929-4978.

Tools, House & Garden

10" MITER SAW - will need cord replaced but works, makita, \$25. chris, Ext. 2094.

ACETYLENE "B" TANK - w/ hose/tip/ base, \$15; air compressor, Dayton Electric, \$35. Chris, Ext. 2094.

BATH SET - shower curtain, mat, towels: yellow background, embroidered flowers, never used. \$25 all. Kathleen, Ext. 7114.

CHAINSAW - 18" Craftsman, gas pwr., hard case, extra chain sharpener, mint, \$75. 698-0057.

LAWN MOWER EXCELLENT CONDITION - \$ 65.00. Joe, Ext. 3783 or 487-1479.

RIDING LAWNMOWER - MTD Yardman 20 hp, 46" cut, \$795 neg. Dennis, Ext. 4028 or 298-4117.

ROYOBI THREE PC SET - 18 Volt Drill, Circular & Saw, Sawsall \$ 70.00. Joseph, Ext. 3783 or 487-1479.

RYOBI 6" BENCH GRINDER - w/ light kit, \$35; table jig saw, Delta, \$50, Ext. 2094.

Miscellaneous

BABY STROLLER - Graco top of the line used 3 times. \$100. (new \$170). Alfred, Ext. 7859.

BATH VANITY - 36" washed oak, matching mirror, not used, \$300/firm; shower base, 36" & glass drs., \$300/firm. 878-0354.

BEBE ANGELCARE - 1/2 yr. used, \$400. Simone, 929-0043.

DIAMOND STUD EARRINGS - .50 t.c.w. white gold, appraised: \$750. Ask \$525 obo. Linda, Ext. 7187 or 516-607-3549.

DOCK SPACE - CENTER MORICHES - Up to 25' water & Electric available. 775-0724.

EMS, OSH Audits Scheduled, 5/21-25

Message from James Tarpinian and George Goode:

During the week of May 21-25, NSF-International Strategic Registrations, Ltd., the independent organization that certifies BNL's conformance to environmental and occupational health and safety standards, will be conducting a re-certification audit of the Laboratory.

Re-certification requires that all BNL organizations be audited to assess compliance with all elements of the International Organization for Standardization (ISO) 14001 and Occupational, Health & Safety Assessment Series (OHSAS) 18001 standards. Department points of contact will be notified via e-mail of the specific times and dates of the organizational audits.

The auditors may randomly interview BNL employees, so everyone is expected to know that BNL has an Environmental, Safety, Security and Health Policy. You can find the policy at www.bnl.gov/eshq/ESSH.asp. It is also posted in buildings across the site.

For more information on this audit, contact your environmental management system representative, your environmental compliance representative, or your Occupational, Safety and Health Management Rep.

- *James Tarpinian, Occupational Safety & Health Management Rep and Assistant Laboratory Director for ESH&Q, tarpinian@bnl.gov*
- *George Goode, EMS Management Rep and Manager, Environmental & Waste Management Services Division, goode@bnl.gov*

HOT TUB - Cal Spa, 7x7 ft., 40 jets, 7 person, great condition, \$3,300. 929-1981.

LAWN MOWER - 22" Craftman, \$75; surfing dry suit, O'Neill Oasis, lg. men, \$95, both items in gd. cond. 878-0898.

LUGGAGE ROOF RACKS - cross pieces (2), from '03 Tahoe, may fit other vehicles, 75/both. Pete, Ext. 2790.

PLUSH ROCKING TIGER - for toddler or preschooler, dark wood rockers, soft and fuzzy tiger \$15. Kelly, Ext. 4901.

REMINGTON TWISTERS - 20 bendable hot roller set, unused, create spiral curls, waves, ringlets, \$9.99. Ext. 2733 or 395-6784.

Yard & Garage Sales

CENTER MORICHES - Estate Sale, 5/19+20. 86B Union Ave. Furniture, tools, house, etc. Dry weather only. Kenneth, Ext. 8463.

SHOREHAM - May 20, 10 a.m.-3 p.m., Walnut Dr., infant items, children's toys, adult clothes, canceled by rain. 929-0043.

YAPHANK - 482 Yaphank-Mdl Is Rd., May 19 & 20, reasonable offers accepted. Ext. 4538.

Free

COMPUTER MONITOR - Gateway VX720 cathode ray tube, 16 inch real diagonal. Richard, Ext. 3741 or 928-8465.

LANDSCAPE BRICKS - white scalloped edging bricks, straight & curved, ~60 linear feet. You pick up. Travis, Ext. 7451.

Wanted

HOUSE TO RENT - at least 2 bdrms, lots of closets, prefer close to Lab, \$1300/mo or less. Excellent tenants w/refs!. Ext. 4538.

HOUSE TO RENT - 2 br, close to Lab, NON-basement, before June 15, gd. credit. Ext. 5351.

LIDS - I'm looking for extra lids you may have left from the paper cups supplied here at BNL. I'll pick up. Ext. 7477.

SHOT GUN 1187 - any gauge, plus others, pay fair \$\$\$. Joseph, Ext. 3783 or 487-1479.

Lost & Found

FOUND: GOLD CUFF LINK - fnd on Sixth Street. Call to identify/claim. Ext. 7686.

FOUND: SET OF KEYS - KIA car, Snoopy and you tell me what else. Ext. 8481.

For Rent

BELLPORT - 1 bdrm apt (new) next to Bellport Village, eik, cac, full bath, w/d, utils incl. \$1,200/mo. Lee, 803-2381.

MEDFORD - 1 bdrm, full bath, sep. ent., eik, all utils. incl. 1 mo sec. No smkg/pets. Avail June 1. \$900/mo./neg. 758-2653.

MT. SINAI - 1 bdrm apt., full bath, l/r rm/kit combo, frig, m/wave, 2-burner hot plate, lg. closets, pvt. ent., sunny grd flr, outdr area, furn/unfurn. \$1,000/mo. 331-2002.

N. SHIRLEY - 1-bdrm. apt., grd level, fully furn, pvt. ent., 4 min. to Lab., utils incl., single, no pets/smkg. \$800/mo. 281-3479.

ROCKY POINT - 1-bdrm. apt., kit., l/r, bath, pvt. dr/way/ent., no smkg./pets, 1 mo. sec., utils not incl. \$850/mo. 821-3287.

ROCKY POINT - 2 bdrm., l/r, kit., bath, nr beach, \$1,275/mo/all. 516-676-5352.

S. SETAUKET - 1 bdrm apt, ac, full bath, w/d, INTAUEN, IO Cabl, priv prkg, \$500 for one rm. \$950/mo. Ma, Ext. 4508 or 882-5666.

SOUTH HAUPPAGUE - bright 1 bdrm., w/ w, eik, bath, l/r, pvt. ent. & yard w/deck, no smkg., pets, prefer single male. Cable/ Optonline. \$975/mo. Denise, 234-0932.

WADING RIVER - furn. apt., sep. ent., immaculate, 1 bdrm., l/r, kit., full bath, sat. TV, no smkg./pets. \$975/mo. 739-7233.

NAPLES, FL - Cypress Woods 2BR/2BA furn condo. Golf mbrshp avail. Steps to pool. Now thru Dec. \$1,350/mo./neg. 523-7870.

For Sale

CALVERTON - mobile home, 14 x 70, family park, 2 bdrm. oak flrs., all sheet-rock, close to all, mint double drway, landscaped yd. \$95,000. 591-2327.

CENTER MORICHES - waterfrt. 50-blkhd 3/4 bdrm, 2 bth, 2 car det. htd. gar/rec rm., new kit., carpet, sidg, roof elec. serv., w/d, hrwdw flrs, dead end \$499,000. 775-0724.

MEDFORD - Updated 3 bdrm. condo in Blue Ridge devel. See www.forsale-byowner.com/20793141. \$329,900/neg. Eileen, Ext. 3995 or 631 696-4366.

MIDDLE ISLAND - 5 Bedrooms, 3.5 Bath, 2-car gar., in ground pool, laun \$459,900/neg. Elvin Cabrera, 917-848-3071.

MILLER PLACE - 4-bdrm.Col., l/r, d/r, lg. eik, den, 2.5 baths, gar., wooded lot, 20 min. to BNL & SBU, 5 min to beach & shopping \$450,000. 473-4715.

SHOREHAM - 4 bdrm. Col., 2-1/2 baths, l/r, d/r, den, fin. bsmt., SWR Schools, igs, 7 min. to Lab \$589,000/neg. Ext. 2253.

SOUND BEACH - all year waterview, 3 bdrm, 2 full baths, l/r, d/r, f/r w/ff, eik, c-a/c, c-vac, 20 min. to BNL, low maint. home. \$400,000. Ron, 516-769-0132.

FANTINEKILL, NY - Catskills, sml equestrian farm, 1.5 ac., views, 1890 farmhouse, guest cott, barn, 2 hr GVB <http://tinyurl.com/2ubtqq>. \$325,000/neg. 447-1423.

PORT ST LUCIE, FL - 4br, 2bth, screen in pool, kitch, lr, dr ,needs some work, tile floors, ac, new roof and paint. \$190,000/ neg. Eva, 1-772-878-7500.

In Appreciation

Thank you all who donated to my Habitat for Humanity Project. The family you helped are beautiful people and they are deeply appreciative for all you have done. Thanks again. — Dave Dono, PE

A sincere thank-you to my friends in the Radiological Control Division and ESH&Q for your thoughtful expressions of sympathy on the loss of my mother. Our family truly appreciates your kindness during this difficult time. — Peter Heotis

Trip to NYC, 6/17

The Hospitality Committee will sponsor a "do as you like" bus trip to the Bryant Park area, in Manhattan, on Sunday, June 17, departing BNL's Recreation Hall in the apartment area at 9 a.m. and leaving the city at 9 p.m. Cost: adults, \$10, children up to 12, \$5. E-mail Jing at de-shanghai@yahoo.fr to reserve. Payat the Rec. Hall on Wed., 5/23 or 6/13, 10-11:30 a.m.