

Quark Matter 2001 Features First RHIC Results

More than 700 physicists from around the world gathered at Stony Brook University (SBU) and BNL for the Quark Matter 2001 conference the week of January 15.

The main highlight was the presentation that Monday afternoon of first physics results from the four experiments at BNL's Relativistic Heavy Ion Collider (RHIC).

These talks filled Stony Brook's 1,049-seat Staller Center for the Arts, and the excitement overflowed into the lobby as participants continued discussing the new findings in small groups during the breaks.

"We were thrilled with the turnout, the liveliness of the scientific presentations, the level of discussion, and the enthusiasm that everyone who

participated brings to the field of quark-matter physics," said conference co-chair Michael Marx, SBU.

The conference marked the first opportunity for international physicists to examine the latest theoretical and experimental results from their searches for a new state of matter — the quark-gluon plasma. The quark-gluon plasma (QGP)

is thought to have existed at the dawn of the universe. By unraveling its secrets, scientists hope to gain insights into how this early state of hot, dense matter evolved into today's more familiar form.

The method the scientists are using to search for QGP is to heat up ordinary nuclear matter by colliding the nuclei of heavy atoms at high speeds in "atom smashers" such as RHIC.

If the collisions are energetic enough, the heat should allow the ordinary nuclear matter, which is composed of quarks and gluons confined within protons and neutrons, to undergo a phase transition. Somewhat analogous to boiling water to create steam, this phase transition would allow the quarks and gluons to flow freely in a hot, soup-like plasma, no longer confined within individual protons and neutrons.

In February 2000, scientists at CERN, the European laboratory for particle physics, suggested that they had observed "tantalizing hints" of quark-gluon plasma in experiments similar to those performed at RHIC. They presented their findings Monday morning and

(continued on page 2)



Gunther Roland, a physicist in the PHOBOS collaboration, presents RHIC results at the Quark Matter 2001 Conference, held at Stony Brook University and BNL the week of January 15.

New Study Shows How Ritalin Works

New BNL research on Ritalin, a drug prescribed to millions of American children each year with Attention Deficit Hyperactivity Disorder (ADHD), shows for the first time how the drug acts in the human brain and why it is so effective.

The findings are reported in the January 15 issue of the *Journal of Neuroscience*. The publication can be found on the Web at www.jneurosci.org/cgi/content/full/20014896.

Although Ritalin has been used for more than 40 years as a successful treatment for ADHD, minimal information has been gathered to date, outside of limited animal studies, on exactly how the drug works in the brain. This latest study of humans indicates that Ritalin significantly increases levels of dopamine in the brain, thereby stimulating attention and motivational circuits that enhance one's ability to focus and complete tasks.

"For the first time, we are seeing that Ritalin given at doses commonly used to treat children with ADHD, significantly increases levels of dopamine in the brain," said Nora Volkow, head of the research team and Associate Laboratory Director for Life Sciences. "This combination — the ability to increase motivation and also directly activate circuits of attention — is likely to be key to the beneficial effects of Ritalin."

Earlier animal and limited

human studies had indicated that Ritalin interferes with the recycling of dopamine within the brain by blocking dopamine transporters. However, since these earlier studies involved injection of much higher doses of Ritalin, it was unclear whether the drug would increase extracellular dopamine at doses used therapeutically for children.

Using a technique called positron emission tomography, or PET, researchers at Brookhaven's Center for Imaging and Neurosciences studied dopamine levels in 11 male subjects. In two sessions, the volunteers were each given a Ritalin dose, calculated using their weight to correspond to the doses given to children who have ADHD, or a placebo. While their brains were scanned to record dopamine levels, the subjects were asked to rate their feeling of restlessness and "high." Meanwhile, physicians monitored each subject's blood pressure and heart rate.

The results showed that, as compared to the placebo, brain

dopamine levels increased significantly approximately 60 minutes following ingestion of the drug.

"We now know that, by increasing the levels of extracellular dopamine, you can activate these motivational circuits and make the tasks that children are performing seem much more exciting," said Volkow. "By raising that level of interest, you can significantly increase the ability of the child to focus on the task."

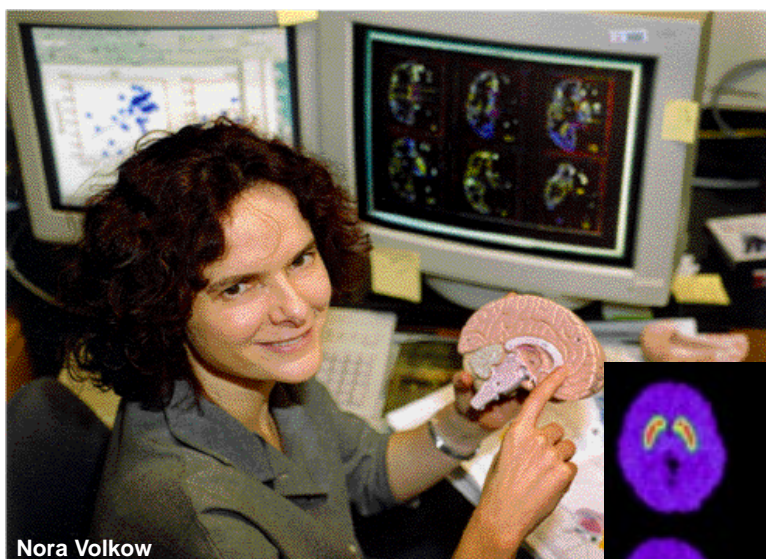
Volkow added that Ritalin also works to suppress "background" firing of neurons not

associated with task performance, allowing the brain to transmit a clearer signal.

"Random activation of other cells can distract you, and children with ADHD are easily distracted," she said. "Ritalin suppresses that background firing and accentuates the specific activation, basically increasing the signal-to-noise ratio and increasing a child's ability to focus."

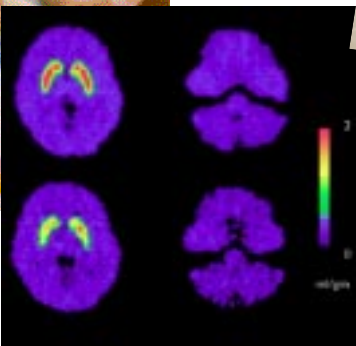
Volkow is now planning a follow-up study of subjects suffering from ADHD. "We hypothesize that we will find that ADHD sufferers have decreased

(continued on page 2)



Nora Volkow

A positron emission tomography (PET) scan showing the effect on the human brain of methylphenidate (Ritalin) versus a placebo. The bottom right figure shows significantly increased brain dopamine levels following administration of 60 milligrams of oral Ritalin, compared to the top right figure, which shows the brain of a subject given a placebo.



The Secret to Success

Quark Matter 2001 could never have been such a huge success without months and months of planning.

In addition to a week of scientific presentations, the conference featured a student symposium, a public lecture by renowned physicist Lawrence Krauss, tours of RHIC, an excursion to the Rose Center for Earth and Space at New York City's American Museum of Natural History, a reception in Berkner Hall, a banquet, and countless other details.

The conference team of more than 100 people from BNL and Stony Brook University (SBU), co-chaired by SBU's Michael Marx and BNL's Satoshi Ozaki and conference secretary Doris Rueger (BNL), began planning for QM 2001 more than a year ago.

In the months and weeks leading up to QM 2001, the team worked out the logistics of running the conference and feeding, housing, and transporting 700 people. In collaboration with the media arm of BNL's Community Involvement, Government, and Public Affairs (CIGPA) directorate and the media relations staff at Stony Brook, they also implemented a plan to maximize media coverage of the exciting science news.

In the end, no one went away hungry, least of all the science reporters. By attending the presentations, a media reception arranged by the conference team, and through in-person and telephone interviews from as far away as Sweden, these reporters got the hottest physics story of the year — and sent the news of RHIC's success swiftly around the world.

To date, CIGPA has logged more than 100 stories, with more to come.

Experiments on Dense Matter Evoke Big Bang

HEALTH & SCIENCE
Optimism About Ion Collider
Physicists cheer at Stony Brook

Trying to Cook a Soup of Free-Range Quarks

Science Times
The New York Times

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 M. Kay Dellimore, Ext. 2873.
- Additional information for Hospitality Committee events can be found at the Lollipop House and the laundry in the apartment area.
- The Recreation Building is located in the apartment area.
- Calendar events flagged with an asterisk (*) have an accompanying story in this week's Bulletin.

— EACH WEEK —

Tuesdays: Welcome Coffee

10-11:30 a.m. Recreation Bldg. Newcomers meet friends. Mimi Luccio, 821-1435
— Hospitality event

Wednesdays: On-Site Play Group

9:30 a.m.-11:30 a.m. Recreation Bldg. Parents meet while children play. Free, drop in any time. Monique de la Bey, 399-7656. — Hospitality event.

Wednesdays: beg.-adv. Dance Lessons

6-9 p.m., Brookhaven Ctr. North Ballroom
Marsha Belford, Ext. 5053.

Wednesdays: Yoga Practice Sessions

12:10-12:50 p.m., Recreation Bldg., free. For more information, contact Ext. 3924.

Tues. & Thurs: Aerobic Dance

5:15 p.m., Recreation Bldg. \$4 per class or \$35 for any ten classes. Pat Flood, Ext. 7886; or Susan Montelone, Ext. 7235.

Mon., Tues., & Thurs:

Cardio Kickboxing

noon-1 p.m., Mon. & Thurs. and 5:15-6:15 p.m., Tues. & Thurs. Mary Wood, Ext. 5923, or wood2@bnl.gov.

— TODAY —

Friday, 2/2

*Outreach & Healthline Lecture

noon - 1 p.m. in Berkner Hall Caring for Aging Parents/Relatives, part 1 - "Relationships and Community Resources Overview" presented by Linda Costanza. Check your mailbox for registration forms.

— NEXT WEEK —

Monday, 2/5

Gospel Songfest

11:30 - 1 p.m., Berkner Hall

Tuesday, 2/6

*Outreach & Healthline Lecture

noon - 1 p.m. in Berkner Hall Caring for Aging Parents/Relatives, part 2 - "Legal and Financial Concerns" presented by George Roach. Check mailbox for registration forms.

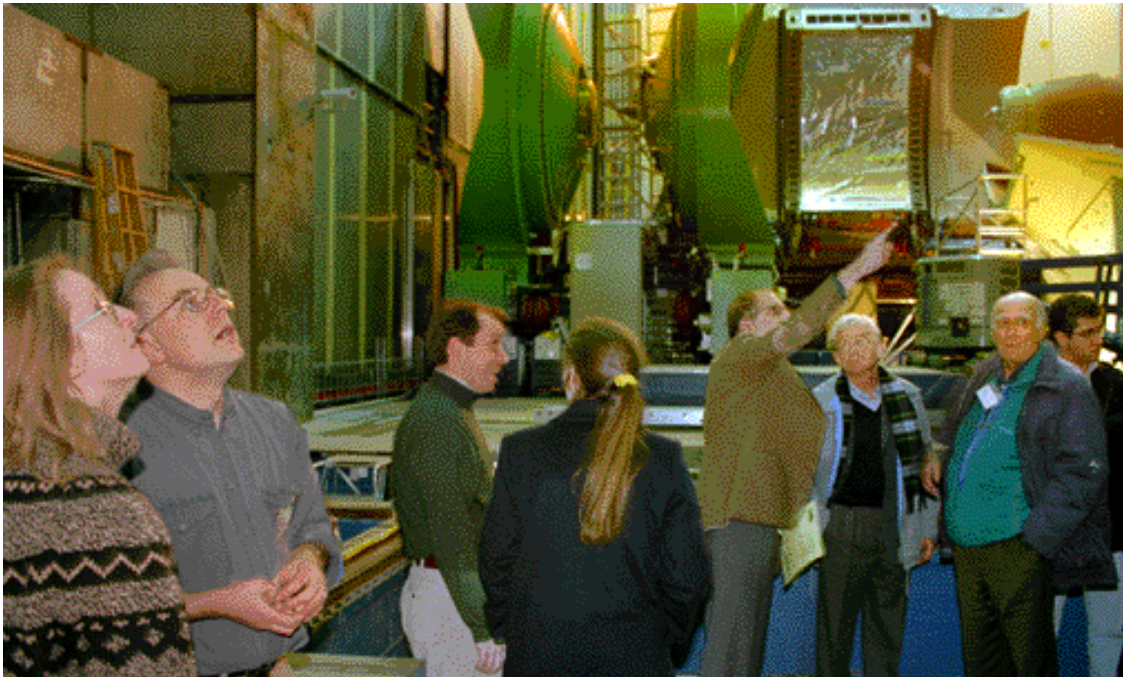
Wednesday, 2/7

Black History Month Talk

11:30 a.m., Berkner Hall Hattie Carwell, Operations Lead at DOE's Berkley Site Office, will present "Blacks in Science: Past and Present." All are welcome to hear her perspective on the history, experiences, and future of blacks in the world of science.

Quark Matter 2001 Conference

(cont'd.)



Roger Stoutenburgh CN-15201

Quark Matter 2001 conference participants tour the PHENIX detector at RHIC.

again at scientific sessions throughout the week. The CERN findings resulted in probing questions from those in attendance.

In contrast, the scientists presenting the RHIC findings, including higher energy densities than ever achieved at CERN, did not make any sweeping claims. But the data suggest that RHIC will be able to detect the quark-gluon plasma with certainty and allow scientists to study its complicated properties.

"This is a truly spectacular machine," said BNL's Satoshi Ozaki, the other conference co-chair. "Already, RHIC has produced more than 200 million gold-ion collisions. And the volume of data already analyzed and presented is unprecedented in this field."

RHIC's four experimental teams — one for each of the collider's detectors — have just begun to focus their "microscopes" on these first collisions. By studying the subatomic debris streaming out from the collision points, the scientists can learn about the conditions at the moment of impact.

"The clear observation of so many species of well-known particles, ranging from common to quite rare ones, indicates that the RHIC detectors are working spectacularly and that the real exploration can begin," says William Zajc, scientific spokesperson for RHIC's PHENIX detector, and one of the nearly 1,000 physicists working at RHIC.

According to John Harris, spokesperson for the STAR detector collaboration, "The collision environment appears favorable for producing matter at high temperatures and densities, which bodes well for the future."

Among the findings so far:

- The energy density — a measure of the energy deposited in the collision region by the col-

liding ions — is the highest ever achieved in a laboratory, at least 70 percent higher than in similar experiments at CERN.

- The pressure created in the first moments of the collisions causes the subatomic debris in the aftermath to flow in an elliptical pattern much more strongly than has been seen before.

- The number of subatomic particles created by each colliding pair of protons and neutrons inside the gold ions is much higher than in similar collisions of two single protons at the same energy.

- The relative abundance of antimatter to matter — in particular, antimatter containing one or more strange antiquarks — is increased significantly compared to similar experiments at CERN. This indicates that conditions have been produced that are closer to those believed to have existed at the beginning of the universe.

- The momentum of fast particles emerging from the collisions drops off dramatically in head-on events, suggesting that their movement is impeded by some new mechanism. It is too early to say exactly what this means, but it could be that the particles are slowed down by having to traverse a new medium, the quark-gluon plasma.

Strikingly Different

How much these early results will contribute to scientists' understanding of a possible phase transition to the quark-gluon plasma is not yet clear. Some of the results are consistent with expectations based on previous work. Other results, however, are strikingly different from what was seen previously.

"The results from RHIC are challenging us to come to a new understanding of the unique environment that we are creat-

ing," says Gunther Roland, who presented the PHOBOS detector data. Only by looking at all the data from RHIC's four experiments will the scientists be able to piece together the complete picture.

"These are still the early days," says Flemming Videbaek, spokesperson for the BRAHMS detector team. "The first year's data are presenting us with a partial map of the heavy-ion collisions. It's as if we were coming to a new land and beginning to see mountains, rivers, and other geographic features." The next step is to understand how these features are related to each other and exactly what they reveal about this new frontier.

The scientists will get that chance as RHIC resumes operations this spring at even higher energy.

During last year's experimental run, RHIC was operated at up to two-thirds of its design energy. Data at different collision energies will give a more complete picture of what happens to matter as it is heated and compressed, and will help the RHIC scientists understand and study the transition to the quark-gluon plasma.

"We are delighted that RHIC is producing such interesting and important physics results so soon after turning on," said Peter Rosen, Director of the DOE's Office of High Energy and Nuclear Physics. "BNL is to be congratulated for an outstanding job of building and operating RHIC, a unique world-class scientific facility. We at DOE look forward to future results with great anticipation and excitement."

As Laboratory Director John Marburger summed up, "This conference made it clear that Brookhaven National Laboratory is once again leading a major development in fundamental science."

— Karen McNulty Walsh

Arrivals & Departures

Arrivals

Nela S. Cintron
Biology

John T. Donnellan
Information Technology

Adnan Doyuran
NSLS

Sachin S. Junnarkar
Instrumentation

Elena S. Lymar
Biology

Barbara J. Panessa-Warren
Biology

Aakin N. Patel
Information Technology

Sean R. Spillane
Physics

Departures

Sheila Bubka
Emergency Services

George A. Heintzelman
Chemistry

Body Building Club

BERA Body Building Club membership dues for 2001 are now overdue. To join the club, make your \$25 check payable to BERA Bodybuilding Club, and send it to Charles Gardner, Bldg. 912, or Elliott Levitt, Bldg. 134A. Effective today, valid ID/membership cards are required during weight room "members only" hours.

Ritalin

(cont'd.)

function of dopamine circuits and are therefore easily distracted," she said. "The effect of Ritalin should be to normalize these levels, allowing ADHD sufferers to focus and pay attention."

The findings also have important implications for another research area — understanding why Ritalin, which is chemically similar to highly addictive cocaine, is not addictive when taken in pill form.

All drugs of abuse increase dopamine levels. However, since oral doses of Ritalin do not produce a "high," the BNL researchers did not expect to see a significant increase in dopamine levels. Since they did see a significant increase, Volkow postulates that another factor is at work.

"We've found that, for drugs of abuse to be effective, they must get into the brain very quickly, and, for that reason, when injected, Ritalin can become addictive," she said. "However, when Ritalin is given in pill form it takes at least 60 minutes to raise dopamine levels in the brain. So, it is the speed at which you increase dopamine that appears to be a key element in the addiction process."

The study's authors also included Gene-Jack Wang, Laurence Maynard, Samuel Gatley, Andrew Gifford, and Dinko Franceschi of BNL's Medical Department, and Joanna Fowler, Jean Logan, Madina Gerasimov, and Yu-Shin Ding of BNL's Chemistry Department.

The research was funded by DOE's Office of Energy Research and by the National Institute on Drug Abuse, part of the National Institutes of Health.
— Pete Genzer

Cell Phone Tower Gets a 'Lift'

The cell phone tower located behind the Brookhaven Center (Bldg. 30) will soon be standing taller: Bell Telephone has proposed raising the tower, currently 100 feet tall, an additional 40 feet to improve cell phone reception in the area surrounding BNL. DOE has approved the project, and construction is expected to begin in February.

The Laboratory is proactively working

with the community to ensure there are no major objections to the change. On Friday, January 26, a 140-foot-tall crane was placed behind the Center, so nearby residents could see what the tower will look like once work is completed.

For more information, contact Kathy Geiger, Community Involvement Office, Ext. 3129.

BNL’s New Exercise, Weight-Lifting Facility Opens



On hand for the ribbon-cutting were: (from left) BERA Bodybuilding Club (BBC) vice president Lori Stiegler, Accelerator Development Department (ADD); BERA Board President Tracy Blydenburgh, Safety & Health Services Division; Bill Hempfling, Interim Director of the Human Resources Division (HRD); Recreation Supervisor M. Kay Dellimore, HRD; Laboratory Director John Marburger; Project Engineer for the gymnasium expansion Thomas Joos, Plant Engineering Division; BBC president Charles Gardner, ADD; Assistant Laboratory Director for Finance and Administration Brian Sack; and Program Coordinator, Office of Management Services, Karen Adelwerth.

About 250 BNLers celebrated the opening of the new exercise and weight-lifting facility at BNL’s gymnasium on January 23. Battelle Memorial Institute and Stony Brook University funded the building of a 650-square-foot mezzanine and the purchase and installation of 17 new pieces of exercise equipment, including a treadmill with pulse meter, an elliptical treadmill, a stair climber, several cycles and a cable crossover, suitable for various types of general fitness and bodybuilding exercises.

Recreation Supervisor M. Kay Dellimore and Karen Adelwerth of the Office of Management Services coordinated the opening celebration, which included a performance by the BNL Gospel Choir, refreshments, a ribbon-cutting ceremony, a tour of the new facility, and information on 20 BERA activities, as well as the opportunity to speak with BERA clubs’ representatives.

“We are privileged to work at Brookhaven,

which offers so many opportunities for the BNL community to pursue their interests through BERA,” Dellimore said. “The exercise and weight-lifting facility is very popular, and the new addition will allow many more people to enjoy it in a safe and pleasant environment.”

The hours of the new exercise and weight-lifting facility are weekdays: 11 a.m. to 12:30 p.m., BERA Bodybuilding Club members only; and 12:30 p.m. to 2 p.m., all employees, retirees, guests and BNL-facility users. All BNLers are also invited to use the facilities on weekday evenings, 5 - 9 p.m., and Saturdays, 10 a.m. - 5 p.m. The facility is closed on Sundays. No one under 18 years old is permitted to use the facility.

Those interested in joining the BERA Bodybuilding Club may contact one of its officers: Charles Gardner, Ext. 5214; Lori Stiegler, Ext. 4617; John Aloï, Ext. 7018; or Elliott Levitt, Ext. 2495.

— Diane Greenberg

ACS Daffodil Sale

BERA will again sell daffodils to benefit of the American Cancer Society (ACS).

Each bouquet is \$7. Paid reservations are being taken at the BERA Sales Office, weekdays, from 9 a.m. to 1:30 p.m. Reserved daffodils may be picked up on Thursday, March 29, at the BERA Sales Office.

Daffodils will also be on sale Thursday, March 29, in the Berkner Hall lobby, from 11:30 a.m. to 1 p.m. For more information call Andrea Dehler, Ext. 3347; or M. Kay Dellimore, Ext. 2873.

LabVIEW Training

The Information Technology Division (ITD) has scheduled a LabVIEW training class from March 26-30, from 8:30 a.m. to 4:30 p.m., in the Bldg. 515 Seminar Room. The cost is \$2,000 per student. Register by sending an ILR for the appropriate amount to Pam Mansfield, Bldg. 515, by February 23. For more information and other class schedules, visit the ITD training page at www.itd.bnl.gov/bnl/training, or contact Mansfield, Ext. 7286, or pam@bnl.gov.

BERA Bridge Club

The BERA Bridge Club runs a duplicate bridge game every other week at 7 p.m. in the Berkner Hall cafeteria. The early 2001 schedule is as follows:

- February 15
- March 1, 15, & 29
- April 12 & 26
- May 10 & 24

Employee to Present Acoustic Guitar Recital, 2/14

James O'Malley, a rigging supervisor in BNL's Plant Engineering Division, will present a free acoustic guitar recital to the public on Wednesday, February 14, at noon, in Berkner Hall.

O'Malley began playing guitar in his teens and writing songs shortly thereafter. He continues to write and has performed widely, including live on WBLI and WSBU.

Earlier, he had performed with The Braid, an acoustic foursome that recorded and toured through the U.S. appearing with, among others, Harry Chapin, and at, among other venues, Carnegie Recital Hall.



Outreach and Healthline Lectures
Caring for Aging Parents & Relatives

Many in the sandwich generation are currently coping with caring for aging parents while struggling to balance responsibilities for family, work, etc.

As a result, old issues with parents and siblings often reemerge. To address how to deal with these problems, Linda Costanza will present the first lecture in the two-part series entitled “Caring for Aging Parents & Relatives” from noon to 1 p.m. today in Berkner Hall. Costanza's presentation will be an overview of relationships and community resources.

Part II of the lecture series will be presented by George Roach on Tuesday, February 6, from noon to 1 p.m., in Berkner Hall. Roach will discuss legal and financial concerns relating to aging parents and relatives, covering the most recent changes in the Medicaid law and the financial impact of illness in caring for elderly parents and loved ones. Basic estate planning will be discussed as well.

Questions will be answered following the lectures. Afterwards, the lectures will be available on cassettes in the Research Library.

BERA Presents Five Gospel Choirs in Concert at Berkner Hall

In honor of the tenth anniversary of the BNL Gospel Choir, BERA will present a gospel concert on Saturday, February 10, at 3 p.m. in Berkner Hall.

In addition to the BNL Gospel Choir, four guest choirs will perform at the concert: the Rush Temple Choir, from the Rush Temple AME Zion Church in Jamaica; Sons and Daughters of Durham, Durham AME Zion Church of Bayshore; the Fulford Ensemble of the First Baptist Church of Cutchogue; and the Kids of the Kingdom, Unity Baptist Church in Mattituck.

Comprised of Lab employees, the BNL Gospel Choir participates in over 30 concerts

and programs annually. The choir took fourth place out of 19 choirs at the 1995 McDonald's Gospel Festival, and it spreads its message of peace by participating in multi-cultural awareness days and other events in various school districts.

Tickets for the February 10 concert may be purchased at the door, but seating is limited, so advance ticket purchase is recommended. Tickets are now on sale for \$10 each, payable in cash or check, at the BERA Sales Office in Berkner Hall. The BERA Sales Office is open weekdays, from 9 a.m. to 3 p.m. For more information, call Ext. 3347.



Calendar

(continued)
Saturday, 2/10

*BNL Gospel Choir Concert

3 p.m., Berkner Hall Auditorium. Four guest choirs will also be performing. Refreshments will be served. Tickets at \$10 per person are available in the BERA Sales Office.

—WEEK OF 2/12—

Wednesday, 2/14

Rifle & Pistol Club Meeting

Noon, Conference Room, Bldg. 535A. For more information, contact Jim Dunan, Ext. 5993; Sue Foster, Ext. 5529; or the club's hotline, Ext. 2658.

Ribbon-Cutting Ceremony

1 p.m., Procurement & Property Management celebrates the opening of the new warehouse, T-100, hosted by Dr. Marburger.

Safety Glasses Office Closed

Thursday, 2/15

*BERA Bridge Club

7 p.m., Berkner Hall cafeteria. For more information, contact Morris Strongson, Ext. 4192, or mms@bnl.gov.

Friday, 2/16

Women Engineer's Lunch Networking Meeting

Noon, Berkner Hall, Room A. Contact Lorraine Merdon, Ext. 3318.

—WEEK OF 2/19—

There will be no Bulletin published this week due to the Lab holiday of President's Day.

Note: This calendar is updated continuously and will appear in the Bulletin whenever space permits. Submissions must be received by the preceding Friday at noon to appear in the following week's Bulletin. Please enter the information for each event in the order listed above (date, event name, description, and cost) and send it to bulletin@bnl.gov. Write "Bulletin Calendar" in the subject line.



**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 employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present 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; call the JOBLINE, Ext. 7744 (344-7744), for a list of all job openings; use a TDD system to access job information by calling (631) 344-6018; or access current job openings on the World Wide Web at www.bnl.gov/JOBS/jobs.html.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees

NS2000. ADMINISTRATIVE POSITION (Counterintelligence Analyst) – Requires a bachelor's degree in political science, or similar field (master's preferred), and experience in locating, assembling, and collecting raw data for analytical use. Experience in assessing and analyzing data to reach judgements, conclusions, and recommendations supported by the assembled facts, and the ability to devise long- and short-term estimates of future trends and possibilities necessary. Excellent written and oral communication skills, and the ability to travel for business are required; U.S. citizenship and possession of or the ability to qualify for DOE Q and Sensitive Compartmented Information (SCI) security clearances necessary. Must successfully pass a CI-scope polygraph examination. Reactor Operations Directorate

DD8429. OFFICE SERVICES POSITION — (Term Appointment) Requires an AAS degree in secretarial science or equivalent experience with excellent organization, communication and computer skills. Demonstrated proficiency in the use of Word, PowerPoint, Excel, and Outlook also required. Will perform various secretarial duties, including pre-

paring correspondence, procedures, reports, and presentations; answering telephones; filing; and operating document control system. Knowledge of BNL policies and procedures is required, as is the ability to handle multiple tasks and prioritize work. Environmental Restoration Division.

OPEN RECRUITMENT – Opportunities for Laboratory employees and outside candidates.

MK2240. ASSOCIATE LABORATORY DIRECTOR, ENERGY, ENVIRONMENT & NATIONAL SECURITY – Reporting to the Laboratory Director, will be responsible to manage and develop a diverse research program in environmental sciences, energy sciences, and national security. Will define the goals and develop the strategic plan for the Directorate. Requires an advanced degree (Ph.D. preference) in science or engineering; a strong research background in one of the main research areas of the Directorate; demonstrated experience and success in managing and developing a medium-size research program in a federally funded environment or in industry; and excellent communications and leadership skills. In addition, requires U.S. citizenship and the ability to obtain and maintain a DOE Q clearance. BNL's management structure and the Directorate's research programs may be obtained from the BNL web site (www.bnl.gov). The position is available immediately and should be filled by October 1, 2001. Interested candidates may send curriculum vitae to Dr. Veljko Radeka, Search Committee Chair, Bldg. 535B, P.O. Box 5000, Upton, NY 11973-5000, radeka@bnl.gov. Director's Office.

NS7228. MANAGER, OFFICE OF EDUCATIONAL PROGRAMS – Requires an advanced degree, preferably in science or science education, and 15 years' experience in R&D or science education. Excellent communication and managerial skills, and a solid understanding of current science education standards and educational environment are essential. Desired strengths include experience in curriculum development, grant writing, budget administration, and familiarity with government and/or large research, technical, or industrial organizations. Duties will include management of the Lab's elementary, secondary, and undergraduate science education programs. Primary responsibility includes management of a professional staff engaged in strategic planning, development, and implementation of science education programs, fund-raising to support education initiatives, and developing and maintaining relations with educational institutions, Laboratory researchers, the DOE Office of Science, and other funding agencies. Additional responsibilities include working with education-related institutions to assist/take the lead in developing and implementing initiatives in

science and technology education consistent with science-education standards and the DOE Lab mission; and developing pathways to recruit under-represented groups into these programs. Community Involvement, Government and Public Affairs Directorate.

MK9080. ASSISTANT SCIENTIST – Requires a Ph.D. with experience in one or more of the following fields: nuclear chemistry, radiochemistry, analytical chemistry, nuclear physics, neutrino science, as well as two or more years of research experience at the postdoctoral level. In addition, must be highly motivated and have a demonstrated ability to carry out independent research. The group's main research focus is on experiments that search for evidence of neutrino oscillations, as a solution to the well-known solar neutrino problem, as is described in the Web site www.chemistry.bnl.gov/jsolar.html. Under the direction of R. Hahn, Chemistry Department.

MK9097. POSTDOCTORAL RESEARCH ASSOCIATE – Requires a Ph.D. in nuclear chemistry, radiochemistry, analytical chemistry, or nuclear physics. Experience in experimental techniques such as preparation and handling of radioactive samples, chemical separation/studies of inorganic species in aqueous and organic media, nuclear detection methods and complex data analyses is highly desirable. Research is with the Solar Neutrino Group with main focus is on searching for evidence of neutrino oscillations as a solution to the well-known solar neutrino problem. Will be expected to spend extended periods of time at the underground laboratories away from BNL. Under the direction of R. Hahn, Chemistry Department.

MK2071. POSTDOCTORAL RESEARCH ASSOCIATE – Requires a Ph.D. in accelerator physics with experience in electron beam dynamics, transport, and diagnostics. Will be working on high average power, superconducting RF photoinjectors. Responsibilities will include DC testing niobium for photoemission, testing and assembling of superconducting RF cavity and characterizing electron beam from all-niobium superconducting RF cavities. Under the direction of R. Srinivasan-Rao, Instrumentation Division.

MK2220. POSTDOCTORAL RESEARCH ASSOCIATE – Requires a Ph.D. in biochemistry or molecular biology, and the ability to travel domestically for collaborative research. Background in nucleic acid biochemistry, or DNA-protein interactions; radiation biology/DNA damage or repair experience highly desirable. Experience in mammalian cell biology helpful. Research work involves the biochemistry and molecular biology of clustered damages in mammalian cells. This includes characterizing

the induction and repair of specific classes of clustered damages by low doses of ionizing radiation, and the genes involved in cluster repair through use of overproducing and knockout strains, as well as evaluating cluster repair in human deficiency diseases. Position may offer the opportunity to participate in the BNL-NASA Heavy-Ion Radiobiology Program and in the Heavy-Ion Radiobiology program at the BNL Booster Applications Facility now under construction. Under the direction of B. Sutherland, Biology Department.

NS2037. WEB DESIGN/DEVELOPMENT POSITION – (reposting) Requires at least three years' experience in Web site design and administration. Knowledge and experience with FrontPage, HTML, CGI, PERL, Photoshop, and the MS Office Suite necessary; experience with Javascript desirable. Proven ability to meet deadlines, juggle simultaneous tasks and keep skills current is necessary; strong teamwork and interpersonal skills are essential. Will develop and maintain the content of the NSLS's main Web pages and assist other department members in creating their own pages. Responsibilities include content management, maintaining the system home page; installing, maintaining, and operating the web server software and other Web-related software. Will assist system administrators maintaining the Windows NT web servers and workstations used to develop content. National Synchrotron Light Source Department.

NS8985. SCIENTIST/COMPUTER ANALYST POSITION – (reposting) Requires an advanced degree in physics or computer science, at least four years' experience in HENP software development, and at least three years' experience in C++ and object-oriented programming. Substantial experience in core infrastructure development is necessary; HENP database and/or data management infrastructure development experience is strongly preferred. Will join a team participating in many areas of ATLAS software, including event model, databases and data management; physics analysis infrastructure; software support and code management; distributed computing; and application software aligned with BNL's ATLAS detector and physics program. Physics Department.

DD8934. ELECTRICIAN POSITION – Under minimum supervision and in accordance with the national electrical codes, or as otherwise directed, lays out, constructs, installs, maintains repairs and operates electrical systems, equipment, controls, and related devices. May be required to perform similar duties on other-than-maintenance-division equipment and facilities. Plant Engineering Division.