

## Where Have All the Students Gone?

# Summer Student Programs Shrink but Survive Funding Cuts

Students are still around every corner, strolling in large, laughing clumps to dinner at the Center, racing bikes with oversized, metal baskets from the dorms to the lab and back again.

This year, the clusters of backpack-clad students are significantly smaller — a result of massive funding cuts in the U.S. Department of Energy (DOE)'s science-education budget.

In 1995, science education received \$64.094 million, but, this year, Congressional appropriations dropped drastically to \$18.9 million.

"It was just not a House priority," said Donna Prokop of DOE's Office of Basic Energy Sciences. "It came directly from Congress. They cut the DOE Headquarters science education staff from 25 to three."

Because of these cuts, some smaller DOE labs lost their entire science-education budget, explained Karl Swyler, Manager of BNL's Office of Educational Programs (OEP).

But Brookhaven was more fortunate: OEP's funding decreased by only 60 percent. Until this year, funding had increased annually.

"Some people take these budget cuts and reductions as a judgment that this is not a valuable program, but that is not true," Swyler said.

### Summer Student Survival

At Brookhaven, the number of students and teachers in OEP's programs dropped from nearly 300 in 1995 to about 230 this year.

"It is not a 60-percent cut, as was our budget's, because the research departments have provided some of the missing funds, and AUI gave addition support," Swyler said.

For example, sponsoring departments paid the direct housing and stipend expenses for students in the 1996 Summer Student Program, while OEP continued to place the students, transport them to the Lab and cover indirect stipend costs. Those who could pay more of the costs allowed OEP to place more students overall than would have otherwise been possible.

Though they are not funded through DOE science-education funds, the Diversity Office's programs for minorities and women also had to institute cost-

sharing measures this year, explained Frances Ligon, who coordinates the Science & Engineering Opportunities Program for Minorities & Women.

Ann Emrick, who places students in the Biology Department, said the number of Biology students went from 28 last year to 24 this year, not a large drop. According to Emrick, the makeup of the department's student population, however, was different due to funding cuts.

The majority came through fully funded programs such as the Diversity Office's Minorities & Women program, or they were volunteers. And this summer, Biology had more local students, thereby freeing up money for stipends that would have been spent on housing.

"We will always have students because they want the experience — even as volunteers," Emrick said. "Since many cannot afford to volunteer, we hope funding for student programs can be reinstated."

### Most Drastic: Precollege Cuts

The most drastic OEP cuts were for precollege education, which ranges from elementary school science contests to teacher-enrichment programs. Swyler believes these programs were the most vulnerable because they have the least obvious immediate outcome.

"I think Congress asked, 'What is DOE doing in elementary schools?'" Swyler commented. The answer: "We want to let both teachers and students know what science — including BNL's — is actually about. And, we want to empower them to teach or learn science the way it is actually done."

Though some precollege programs were eliminated, most were consolidated, changed or offered with cost-sharing. In addition, certain OEP services were eliminated. For example, BNL no longer offers transportation from local schools to the Lab, and stipends for high school students were cut from \$900 to \$240 in the Community Summer Science Program.

Because teachers influence so many students, OEP is emphasizing opportunities for science and technology teachers. Finally, the office found funding from sources other than DOE. (continued on page 3)



— All photos in this issue by Roger Stoutenburgh

# Discovering the Nature of Brookhaven National Lab

Beyond BNL's big machines, stark offices and intermittent traffic is a tall, quiet world of standing pines. This forest is a refuge for a wide variety of unique plants and animals in what is elsewhere a dwindling ecosystem.

This coming Sunday, for the first time, the public will be guided on nature walks in BNL's Pine Barrens. These walks will be led by Larry Haman, a science teacher at South Manor Middle School, and Jonathan Barton, a Summer Sunday tour guide who is an undergraduate in geology at Cornell University.

"I've been coming here all my life, but never really looked around at what was here," said Barton, the son of Donald Barton, Relativistic Heavy Ion Collider Project. He explained that the Lab's natural environment is a great place to explore.

BNL's forest makes up almost five percent of Long Island's Pine Barrens, and it contains ecosystems as diverse as wetlands and white-pine groves. But its most distinctive feature is the pitch pines and oak trees rooted in the dry, sandy soils.

Pitch pine is resistant to burning and relies on fire to reproduce. Its serotinous cones only release their seeds when exposed to heat, which melts the resin sealing the cone's scales shut.

The Pine Barrens are also distinguished by the frequency of wild fires. Frequent burnings cause pitch pine to dominate certain areas because, unlike the oaks, the pines survive the fire. Pine seedlings can then take root in the newly mineralized soil. Natu-



**Community Summer Science Students help to build BNL's nature trail: (from left) Christopher Ramo, science teacher Larry Haman, Wendy Andia, Marc Gioglio, Tracey Miltenberger, Xibei Jai, Emmanuel Bello, Dustin Gonzales and Francisco Yeo.**

ralists find that areas dominated entirely by pines often contain partially burned trees.

"At BNL, we are too close to buildings to have fires, so some areas are pure pine and some areas are pure oak," said Haman. If an area does not burn, oak trees will eventually take over.

In areas where pines and oaks aren't competing for space, white pines stretch out their delicate needles. These trees, not indigenous to the Pine Barrens, were planted in 1930s by the Civilian Conservation Corps of the Works Project Administration, which was charged with establishing the Upton National Forest on the former site of World War I's Camp Upton. Small stands of white pines mark the

location of the former U.S. Army camp's buildings, Haman explained.

Hiding among all the trees is a wild variety of birds and other animals.

"If you came here in the morning, you could call this warbler woods," Haman said.

Kestrels, a type of small hawk, and a great blue heron were sighted recently at BNL. There are also "plenty of toads" and no shortage of deer, Haman said. BNL's Pine Barrens also provides habitat for the endangered tiger salamander and blue lupine flower.

Participants who don't get a glimpse of these animals or rare plants will still certainly get to see BNL's amalgam of geological features.

The tour ends at an "erratic" — a

big chunk of gray quartzite dropped by the Wisconsin glacier as it receded during the Ice Age.

"The glacier acted like a giant conveyor belt," Haman said, by carrying the boulder and other glacial debris down from its original location which was probably New England.

"Everything on Long Island is technically an erratic," said Barton with a chuckle. In fact, glaciers formed the entire island.

Barton is working with the nature walk part of the tour program because he wants to learn more about ecology and contribute what he knows about geology.

"It will also help me know how I feel about getting up and explaining things to people, which is important because I want to be a professor," he said.

Soon, a booklet, written by Renée Flack, Office of Educational Programs, will be available for self-guided hikes through BNL's natural areas.

"There is a lot of potential for education here on site," Haman said.

— Sarah Gilbert

**Take a Hike!**


**Visitors and employees are invited to take a guided nature walk which will be offered during the next three Summer Sunday tour days, August 4, 11, and 18, at 11 a.m., 1 p.m., and 3 p.m. To reserve a spot, call Ext. 4049.**

## The Next Generation of Women in Science

*This summer, I am one of over 200 students who came to BNL as a career stepping stone. As a female who left science in favor of journalism, I remain curious about the experience of women in science.*

*In this story, I take the opportunity to explore the experience of three female science students working in BNL's predominantly male environment. I found my peers admirably ambitious and perceptive about their roles as women in a male-dominated field.*

— Sarah Gilbert

***"I was blessed to have a high school teacher who was interesting. She was very involved with students, and, with her encouragement, I found I could do chemistry when I put my mind to it."***

— **Joneice Peppers**

Peppers is an undergraduate chemistry major from North Carolina Agricultural & Technical State University. A member of the BNL summer student program, she is working with Appathurai Vairavamurthy in the Department of Applied Science, identifying the mechanisms of nitrogen and sulfur fixation in fossil fuels.

Peppers would like to become a forensic toxicologist. "I'm interested in the human body," she said.

Peppers views herself as a double minority in this field — black and female. "I bring variety and a different point of view," she said.

For example, minorities and women need to be in science to do research on the diseases and problems that plague minority groups and women, she said.

Her experience at BNL has opened other doors for her in chemistry. "It has made me more eager to learn because there is so much out there we don't know," she said.

Although Peppers is reluctant to call herself a role model, she expressed enthusiasm about paving the way for female and minority students of the future.



***"For as long as I can remember, I've always wanted to be a physician. I would have the power to save someone's life. It's awe-inspiring and humbling."***

— **Simone Porter**

Porter is an undergraduate in biological anthropology and anatomy at Duke University and is working with Stephen Dewey, Chemistry Department, on the effects of cocaine on dopamine receptors in the brain.



Porter came to Brookhaven as part of a yearly \$10,000 scholarship sponsored by the National Association for the Advancement of Colored People and the U.S. Department of Energy. She tutors high school students, volunteers at a hospital and sings in a touring choir as part of the scholarship's 120-hour community-service requirement.

Her experience at BNL has contributed to her career goals by giving her a broader view of medical science. "Dr. Dewey has tried to expose us to as much as is available to us," Porter said.

Porter not only sees herself as a role model, but she also embraces her role as an African-American woman in science. "It is something that is thrust upon you," she said.

"I have accepted it. . . . I expect to make a difference in the way people perceive individuals of my race and my gender."



***"I teach science, but I had never actually done science."***

— **Maria Gerena**

Maria Gerena is a master's student in science education at New York University, who is working this summer as part of the Teacher's Research Associate Program.

She came to BNL to experience scientific research firsthand as part of a requirement for her master's degree. She hopes that her work will be published in a professional journal.

Gerena is working in the Energy Efficiency and Conservation Division, Department of Applied Science, with Toshi Sugama, testing a starch-derived coating for aluminum.

She said she has learned that science is interdisciplinary, crossing the fields of science and all subjects.

Gerena teaches 7th- and 8th-grade Hispanic and African-American students at a school in Long Island City.

Although Gerena expects that only two percent of her students will enter scientific fields in college, she wants them to see the applications of science to the real world and develop an appreciation for science.

Gerena sees herself as a role model for her students. As a Hispanic and Italian woman, she is demonstrating, "It is very important to have women, especially non-white women, in science."

Gerena will be at BNL until the end of August, and she is making a video of her experience for her classroom.

Overall, she has found the atmosphere at the Lab interesting and relaxing, and she has been impressed by the support that she has received from her advisor.

"I am intrigued by being here," Gerena said.

## Sounds Like Nuclear Chemistry

At midnight in Fleming Hall, the droning of the television dies, and the sound of ardent voices fills the lounge.

"It's a book!"

"Four words!"

"Second word!"

"Small word . . . the . . . is . . . and!"

"It's and. It's and."

"First word, three syllables!"

"Listen . . . tune . . . radio!"

"Radio and Nuclear Chemistry!"

"That was too easy."

"O.K. I've got one."

"No, I have to get back to work."

And work they did. Aside from the regular evening game of charades, this summer's nuclear chemistry students worked hard.

"When they say 'intensive' on the application, it should be in neon lights with sound," said Betsy Hubred, a chemistry and math major at Alverno College. "We do chemistry all day and then do chemistry all night."

For the eighth year, a dozen students from around the country attended the six-week Summer School in Nuclear and Radio Chemistry offered by BNL's Chemistry Department and sponsored by the U.S. Department of Energy and the American Chemical Society. BNL's program was established as a result of the initiative of Seymour Katcoff, Chemistry.

"This year, there were more than 80 applicants," said Yung Yee Chu,

Chemistry, who coordinates the program. Only 24 students are selected, half of whom attend the same program at San Jose State University.

The nuclear chemistry students departed from the Lab on July 27 to return to their colleges. All of them plan to attend either graduate school or medical school — six of each.

Five days a week, the students attended lecture all morning and did lab work in the afternoon. By the end of the course, they had taken three tests, made a presentation and handed in ten lab reports.

Nicole Kounalakis, a biology major at Barnard College, took the course because she wanted to see what BNL was like and felt "it was a good alternative to working in a lab." Aside from learning a lot about nuclear chemistry, which she hopes will help her in medical school, Kounalakis learned "what it takes to be a scientist.

"I didn't realize how much science is really a group effort," she said. "Everyone gives different perspectives to one issue."

All the students found the course very intensive, and, judging by the number of people clustered around work tables in Fleming Hall at all hours of the night, they also learned a lot.

"You have a lot to do in a short amount of time," said Walter Hollinger, a premedical student from the



**The Summer School in Nuclear and Radio Chemistry (center) Duy-Vu Deo, Laura Crouch, (clockwise from left) Xenia Protopopescu, Shelly Nixon, Nicole Kounalakis, Joe Schenck, Chris Castro, Walter Hollinger, instructors Seymour Katcoff and Yung Yee Chu of the Chemistry Department, Betsy Hubred, Phillip Simon and Bob Youker.**

New Jersey Institute of Technology. He took the course to explore some of the applications of radionuclides in medicine. Hollinger would like to go to and, he added, "graduate from" medical school.

During the week, the students studied, but weekends left opportunities for doing other things — like getting engaged.

On July 4, at the fireworks in New York City, Phillip Simon asked Laura

Crouch to marry him. Both students are from Capital University.

"We met our freshman year in chemistry class, and we started dating in February," Simon said. He was nervous because the ring wasn't ready when he left home, so his mother had to mail it to him. It arrived just in time, on July 3.

"We generally don't play Cupid, but, in this case, we did it inadvertently," Chu said.

— Sarah Gilbert

## GEM of a Student Saves HFBR \$15,000

Jeffrey Lewis doesn't clip coupons. But he does save money. In fact, this student has saved the High Flux Beam Reactor (HFBR) nearly \$15,000.

While working at the HFBR this summer, Lewis was charged with updating one of several systems that monitor water leaks at the reactor, explained his supervisor, Bruce Abel.

Leak detectors throughout the HFBR, Bldg. 750, send signals to leak-monitoring instruments, which alert reactor personnel if there is a tritium leak in the cooling-water system.

Although water leakage from the reactor does not occur very often, it is very important to detect it at an early stage.

While the current system is quite sensitive, it is also complicated and inefficient. Lewis said the system does not immediately pinpoint the problem; instead, someone has to remove wires coming from different locations to identify the problem area.

"It is very time-consuming," Lewis said. "I wanted to set up a system which would tell us exactly where the leak is instead of our having to look for it."

His challenge was to take input from many different areas and have the signal processed in one place.



**Jeff Lewis saved nearly \$15,000 by redesigning one of the leak monitoring systems at the HFBR using off-the-shelf parts.**

"It was a basic electrical engineering problem," he explained. "You have a lot of signals: How do you minimize the number of signals?"

A previous summer student had estimated the system overhaul cost at \$15,000, Abel said.

"Jeff decided he knew a way he

could do it cheaper," Abel explained. "And he did it for pocket change with a couple of parts from Radio Shack."

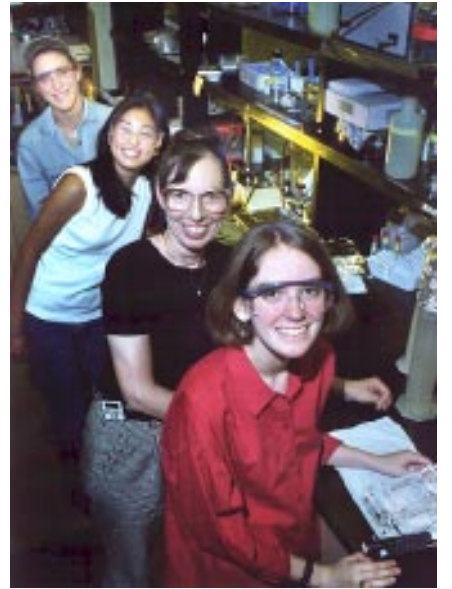
Lewis is at Brookhaven as part of the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. — more commonly known as the GEM Program — which is run by Jeffrey Taylor in the Diversity Office. The organization gives students graduate fellowships, and, in return, the students work for up to three summers.

"Three of my physics professors had worked here, so I was interested in Brookhaven," Lewis said. "The only thing I didn't know was that I'd be working at the reactor. I am really one of the few electrical engineering types working at the reactor."

Lewis was graduated in February from the Rochester Institute of Technology, and he will begin working on his master's degree at Georgia Institute of Technology in the fall.

His leak-monitoring system entered the testing phase this week and should be completed some time this summer.

"I'm glad that I could help them out," Lewis concluded. "It is nice to think I'll leave a little legacy here at Brookhaven." — Andrea Widener



**The three Amys and their advisor in their Biology Department lab: (from front to back) Amy Lepre, advisor Betsy Sutherland, Amy Tanaka and Amy Carroll.**

## Not Amy-nonymous

If you're searching for Amy, try Betsy Sutherland's laboratory in the Biology Department. This summer, Sutherland has three students in her lab who are all named Amy: Amy Carroll is a graduate student from the University of Maine working on DNA damage in sea urchin embryos; Amy Lepre is an undergraduate from the Massachusetts Institute of Technology studying ultraviolet light-induced DNA damage in soybean plants; and Amy Tanaka is a Shoreham-Wading River High School student who does computer work on an experiment to test cell damage from ionizing radiation.

Sutherland said she just solves the problem by running their first and last names together into Amycarroll, Amylepre and Amytanaka.

So far, the trio say the coincidence hasn't caused any major problems, though Lepre had once talked to Tanaka's mother on the phone for a few minutes before they realized what was happening.

"She asked if I were sure this was Amy," Lepre said. — Andrea Widener

## Shrinking Programs (cont'd.)

There are no guarantees for future funding. "It is not going to be better," Swyler said. "And it might be worse."

However, the impact of funding cuts on the future of science and engineering must be considered, as it affects the nation as well as Brookhaven, commented Jeffrey Taylor, Diversity Office, who coordinates the National Consortium for Graduate Degrees for Minorities in Engineering & Science, Inc., and the National Physical Science Consortium.

Programs that target college students as freshmen and sophomores are especially important, added Ligon, because that is when minority and women students are most vulnerable to dropping out of science.

"The excitement of the staff excites these students," she said, "and they pass that excitement on. You just can't put a price on that, so we must continue to be creative about finding ways to bring students to Brookhaven and keep their interest in science."

— Andrea Widener

## Cooking Exchange

Apartment-area visitors are invited to the Cooking Exchange's potluck luncheon on Thursday, August 8, from noon to 1:30 p.m., at the picnic area near the playground. Meet your neighbors and sample dishes from around the world. Bring a favorite dish of your own cooking for sharing and some toys for your children. For more information, call Mary Mardon, Ext. 1035.

## Summer Students Explore Opportunities



**Students from several summer programs met to learn about opportunities in science and engineering at an informational workshop sponsored by Frances Ligon, Diversity Office, on June 27. Guest speakers talked about summer and permanent employment opportunities in general, as well as those unique to Brookhaven. The students in this picture were from several different groups from the Diversity Office and the Office of Educational Programs, including the Science & Engineering Opportunities Program for Minorities & Women, the U.S. Department of Energy/National Association for the Advancement of Colored People Scholars Program, the Professional Associates Program for Minorities & Women, and the Suffolk Community College Student Faculty Experience program.**

— Andrea Widener

## Register for Weight Watchers

Registration for the next on-site, lunchtime Weight Watchers series will be held on Wednesday, August 7, from noon to 1 p.m. in the South Dining Room of the Brookhaven Center. In its approach to weight management, Weight Watchers offers a nutritious food plan, an activity plan and a behavioral support plan.

Starting on August 14, the class will meet on Wednesdays for eight to ten weeks, depending upon the number of people who sign up. Since the Lab pays \$10 per participant, the fee is \$79 per person. For more information, call Health Promotion Specialist Mary Wood, Ext. 5923.

## 50 YEARS AGO THIS WEEK

*This series, which recounts the earliest days of Associated Universities, Inc. (AUI), and BNL, will run as appropriate throughout 1996 and 1997, the 50th anniversary years of AUI and BNL, respectively.*

• **August 1946** — Lyle Borst, of the Physics Department of Clinton Laboratory at Oak Ridge, is placed in charge of the design and development of the nuclear reactor to be built at the new laboratory. The "pile," says the Initial Program Report, "will be an air-cooled graphite-uranium pile similar to that at Oak Ridge but having several

improvements. Although it is considered to be a low-intensity instrument, its neutron flux will, nevertheless, exceed that of other existing experimental piles. Experimental facilities sufficient to accommodate an extensive research program will be incorporated in the original design."

(To be continued on August 16.)

## Computing Corner

*The Computing & Communications Division (CCD) offers the following:*

### Eudora & Netscape Mail

On Thursday, August 8, in the CCD Seminar Room, Bldg. 515, CCD's Personal Computer Resource Center will repeat its demonstration of Eudora e-mail software, from 10 to 10:30 a.m., then Netscape Mail, from 10:30 to 11 a.m. For more information, contact Bob Barone, Ext. 2368 or e-mail barone1@bnl.gov; or Laurie Pearl, Ext. 5520 or e-mail pearl@bnl.gov.

### UNIX Training

The following UNIX-based classes are scheduled for Monday through Friday, September 16-20:

Introduction to UNIX	9 a.m.-noon
Perl programming	9 a.m.-noon
C programming	1-5 p.m.

Each five-day course costs \$350 per person.

To register, send an ILR for that amount to Pam Mansfield, Bldg. 515, by August 30. For more information, call Ed McFadden, Ext. 4188 or e-mail emc@bnl.gov.

### ORACLE Training

A five-day ORACLE introductory course is planned for October 21-25. The fee will be \$1,625 per person. To register or for more information, contact Pam Mansfield, Ext. 7286 or e-mail pam1@bnl.gov; or Susan Eng Wong, Ext. 7988 or e-mail sge@bnl.gov, by August 22.

## BROOKHAVEN BULLETIN

Published weekly by the Public Affairs Office for the employees of BROOKHAVEN NATIONAL LABORATORY

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Bldg. 134, P.O. Box 5000  
Upton NY 11973-5000  
Tel. (516) 344-2345; Fax (516) 344-3368

World Wide Web:  
<http://www.pubaf.bnl.gov/~pubaf/bulletin.html>

The Brookhaven Bulletin is printed on paper containing at least 50 percent recycled materials, with 10 percent post-consumer waste. It can be recycled.



## DOE Offers Workshop

The U.S. Department of Energy (DOE) will sponsor a free, two-day, introductory level workshop on environmental laws and radiological risk assessment, on Monday and Tuesday, August 12 & 13, at the Holiday Inn, 3845 Veterans Memorial Highway, Ronkonkoma.

On the first day, sign-in will begin at 7:30 a.m., then environmental laws will be the subject from 8 a.m. to 5 p.m. Participants will become familiar with the basic intent of the federal laws and regulations that impact the operation of the DOE Environmental Restoration Program's remediation activities.

The second day's portion of the workshop, which will run from 8 a.m. to 4:45 p.m., will stress the basic principles of radiation, radiological risk assessment, risk perception and risk communication. Radiological instrumentation will also be demonstrated.

A continental breakfast and afternoon snack will be provided each day, but participants are responsible for their own lunches.

The workshops are open to all, and participants *must preregister* for one or both days by Friday, August 9, by calling the DOE Brookhaven Group office, Ext. 5345.

## BWIS Meeting

Fulvia Pilat, an accelerator physicist with the Relativistic Heavy Ion Collider (RHIC) Project, will be the guest speaker at the next Brookhaven Women in Science (BWIS) meeting, on Tuesday, August 6. Her talk on "Accelerator Physics and the RHIC Project" will begin at noon in Room A of Berkner Hall.

Pilat received her Ph.D. in physics at the University of Trieste in 1986, for her work on the application of nonlinear dynamics to accelerator physics. She spent four years at the European laboratory, CERN, working in the Proton Synchrotron and the Large Electron Positron Collider Divisions. In 1990, she joined the Superconducting Super Collider Laboratory. Pilat came to BNL in 1994 as a physicist in the RHIC Accelerator Physics Group.

All are invited; please bring lunch.

## Weekend Outings

After this weekend, for which a trip to Great Adventure Amusement Park has already been planned, the Lab will continue to offer students and other visitors living on site a Saturday shuttle service to area attractions, through the Labor Day weekend.

On Saturday, August 10, the van will drop riders at their choice of four destinations: Jamesport Beach, the Riverhead Aquarium, Splish Splash water park and the Tanger Factory Outlet Center.

On Saturday, August 17, visitors can go to the village of Port Jefferson or the Smith Haven Mall.

On both days, vans will leave from Fleming House parking lot at 1 p.m., and return to BNL at 5 p.m.

Destinations for the remaining weekends will be published in next week's Bulletin. For more information or to reserve a van seat, call Juanita Beatty, Ext. 2535, today.

## Arrivals & Departures

### Arrivals

**Alexander E. Morgan**.....Chemistry  
**Vincent J. Rancaniello**.....Environ. Rest.

### Departures

This list includes all employees who have terminated from the Lab, including retirees:

**Lynette G. Bennett**.....NLS

## Classified Advertisements

### Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position. Consideration is given to candidates 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, handicap or veteran status.

Each week, the Human Resources Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Human Resources, and second, for general recruiting under 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, or call the JOBLINE, Ext. 7744 (344-7744), for a complete listing of all openings.

Current job openings can also be accessed via the BNL Home Page on the World Wide Web. Outside users should open "http://www.bnl.gov/bnl.html", then select "Scientific Personnel Office" for scientific staff openings or "Employment Opportunities" or "BNL Human Resources Division" for all other vacancies.

**SCIENTIFIC RECRUITMENT** - Doctorate usually required. Candidates may apply directly to the department representative named.

**SCIENTIST** - Trained in physics, chemistry or materials science, with several years' experience in neutron, x-ray or light scattering. Neutron-scattering experience is preferred. Will participate in basic research involving the properties of materials utilizing neutron beams generated by the High Flux Beam Reactor. Should be capable of carrying out his or her own research program. Contact: John Axe or Stephen Shapiro, Physics Department.

**POSTDOCTORAL RESEARCH ASSOCIATE** - Trained in condensed-matter physics. Experience in thin-film and surface magnetism, spin polarization and synchrotron radiation is required. Research involves magnetic properties of thin films using spin-polarized photoemission, and implementation of a new high-resolution, high-transmission electron spectrometer at the National Synchrotron Light Source. Contact: Peter Johnson, Physics Department.

**POSTDOCTORAL RESEARCH ASSOCIATE** - Trained in theoretical physics, with experience in many-body theory as applied to condensed-matter physics. Program involves applications of theory of correlated electron systems to high-temperature superconductors, magnetism, structural phase transitions and other current problems in condensed matter physics. Experience interacting with experimentalists preferred. Contact: Victor Emery, Physics Department.

**LABORATORY RECRUITMENT** - Opportunities for Laboratory employees.

DD 4530. **SECRETARIAL POSITION** - (term appointment) Requires an AAS in secretarial science or equivalent and demonstrated high level of competence in organization and communication skills; knowledge of IPAP, INFORM, WordPerfect and MS Word highly desirable. Duties will include varied secretarial responsibilities, including travel preparation and assisting in Department Chair's Office. Will also provide secretarial support to the Computer Systems Division and Technical Division as needed. National Synchrotron Light Source Department.

**OPEN RECRUITMENT** - Opportunities for Laboratory employees and outside candidates.

DD 9041. **COMPUTING ANALYST POSITION** - Requires a BS/MS, advanced degree preferred, in a physical or biological science or equivalent, a strong background in developing computer programs for use in the analysis of crystallographic data, research experience and a strong publication record in macromolecular computational crystallography. Will oversee all activities related to the development of application programs for input and validation of structural data. Responsibilities will include evaluation and adoption of new protocols for assessing and reporting error levels in the Protein Data Bank entries. Biology Department.

NS 2214. **ENGINEERING POSITION** - Requires a BS/MS in mechanical or nuclear engineering or equivalent, and experience in machine design, manufacturing technology and stress analysis. Experience with nuclear reactor shielding a plus. Responsibilities will include directing a small staff of designers and technicians in the design and construction of experimental facilities for use in the High Flux Beam Reactor. Will be responsible for both the budgetary and technical aspects of the projects. Physics Department.

NS 3848. **ENGINEERING POSITION** - Requires an advanced degree in optical/precision engineering, metrology or equivalent, and experience with motion-control systems, CCD cameras, knowledge of classical optical shop fabrication and measurements techniques. Responsibilities will include the design, construction and installation of precision optical metrology instrumentation, including new optical surface profiler systems. Instrumentation Division.

Dosimetry badges will be changed tomorrow. Please place your badge in its assigned rack space before leaving work today.