

NSLS Researchers Discover New Properties of Superconductors

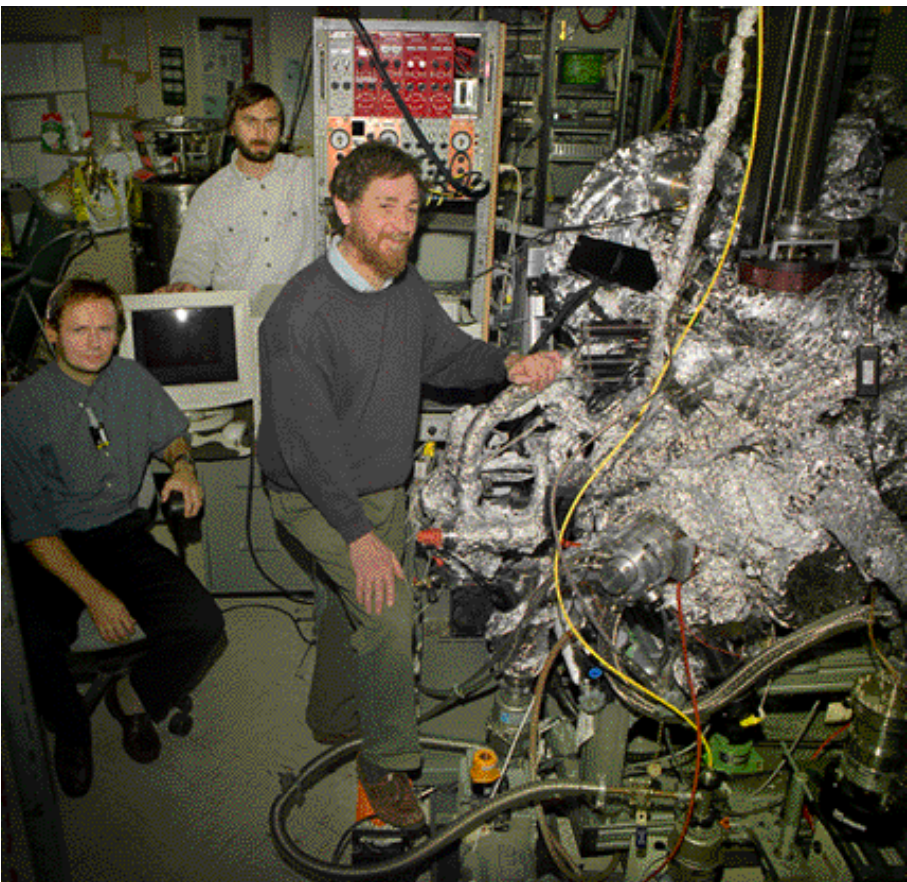
A team from BNL, the University of Connecticut, Australia, and Japan has provided important new insights into the properties of new high-temperature superconductors.

The research team included Peter Johnson, Tonica Valla, and Alexei Fedorov, all of the Physics Department; Steve Hulbert of the National Synchrotron Light Source (NSLS) Department; and Quiang Li, Department of Applied Science. They published their results in the September 24th issue of the journal *Science*.

Johnson and his colleagues were investigating the temperature dependence of electronic excitations generated in a new superconductor when exposed to intense ultraviolet light. The team discovered that the lifetime of the excitations varies in a linear fashion with temperature and is surprisingly unaffected by the onset of superconductivity.

"The observations suggested evidence of a new electronic state called a quantum critical state existing at very low temperatures," says Johnson. "The correlations among electrons in this state may be closely linked to correlations that lead to the resistance-free state of superconductivity."

The property of superconductivity



Shown at the experiment on beam line U13 at the NSLS are: (from left) Tonica Valla, Alexei Fedorov, and Peter Johnson.

is that at very low temperatures, many metals and alloys lose electrical resistance and become "super" conductors: they allow electricity to flow through them freely. If an electric current is introduced into a superconducting loop and the power is then turned off, the current will flow forever — as long as the temperature is maintained below a critical value that is characteristic of the material used.

At BNL, superconducting magnets are used in such big machines as the Relativistic Heavy Ion Collider as well as in smaller experiments. Superconducting magnets are much more powerful than conventional magnets, and, once started, they can run indefinitely on nothing but the power required to maintain the low temperature.

"The greatest hope of condensed matter physicists is to obtain a room-temperature superconductor," says Johnson. "Just some of the practical results could be better electric motors, more efficient transmission of electrical power, and better nuclear magnetic resonance imaging systems for medical diagnostics."

For more information about the experiment, go to www.sciencemag.org/cgi/content/full/285/5436/2110.

— Ann Ferrar Dusek



On the podium at the October 26 all-hands meeting of the DOE Task Force Against Racial Profiling are: (from left) George Malosh, Manager, DOE Brookhaven Group; William Valdez, DOE Office of Science; Roger Lewis, DOE Office of Defense Programs; and Carson Eoyang, on detail to the DOE Office of Science & Technology Policy. DOE Senior Policy Advisor John Robinson presented the Task Force's findings.

Race Task Force Reports Atmosphere Of Distrust, Suspicion at DOE Labs

Members of DOE's Task Force Against Racial Profiling, formed to investigate allegations of racism at DOE labs following reports of espionage at Los Alamos, presented their initial findings and invited comments in Berkner Hall on Tuesday, October 26.

"The Task Force is here to remind us that this issue requires our attention," said Lab Director John Marburger, who emphasized the important contributions made by foreign scientists to Brookhaven's work. "We are here to learn about our own situation and what we might do to make it better."

Based on visits at Los Alamos, Sandia, and Lawrence Livermore Labs last June, John Robinson, a senior policy advisor to Secretary of Energy Bill Richardson, said his group had found "an atmosphere of distrust and suspicion" affecting Asian Pacific American employees.

News coverage of the case of Wen

Ho Lee, a Taiwan-born naturalized American who was dismissed for security violations at Los Alamos last March, fueled anti-Chinese sentiments, he said. He further stated that ambiguity about certain DOE policies—particularly those regarding foreign nationals—combined with renewed security vigilance following the Lee case had heightened anxiety among national lab employees at all levels.

Robinson reiterated the Energy Secretary's pledge of fairness, vigilance and equity in the DOE workplace, and his commitment to address these issues to prevent a "brain drain" of qualified scientists and to help restore public confidence in all DOE lab employees.

The need for such measures was echoed in comments from BNL staff, including a few who reported instances where Lab Asian-American employees or guests were questioned — in one

(continued on page 2)

349th Brookhaven Lecture Exploring Matter With Neutrons

If you throw a ball into a thick mist and it bounces back, you realize that the ball hit something solid in the mist. By throwing many more balls, you could find out whether the solid is a tall, thin tree, or a short, wide wall.

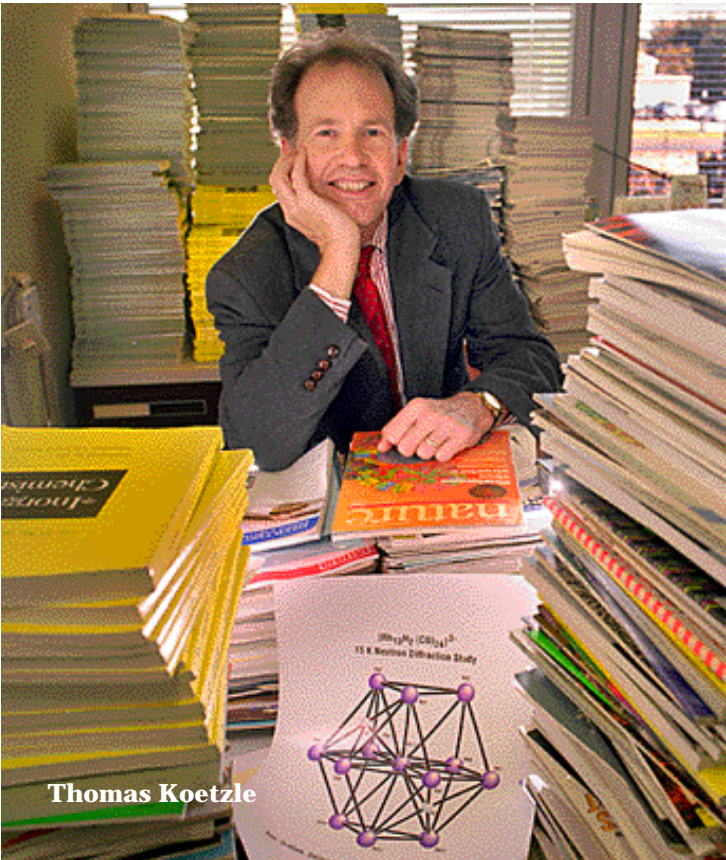
When researchers send a beam of neutrons flying into a sample of matter, the neutrons enter each atom in the sample, are deflected by the atom's nucleus, and scatter into a pattern. By studying the pattern, researchers can understand more about the structure of the material they are investigating.

In addition to revealing structure, neutrons can also probe molecular dynamics and give information about the movements of a molecule when it is excited from one energy state into another.

To talk about his work in this field, Thomas Koetzle, a research collaborator in the Chemistry Department, will give the 349th Brookhaven Lecture, on "What Can Neutrons Tell Us About Molecular Structure and Dynamics?" The talk will be on Wednesday, November 10, at 4 p.m., in Berkner Hall. Koetzle will be introduced by Chemistry Chair Carol Creutz.

Koetzle will describe how, for the past three decades at BNL, the Brookhaven Neutron Crystallography Collaboration (BNCC) has investigated structures such as ferroelectrics, gas clathrate hydrates, and

(continued on page 2)



Thomas Koetzle

Cleanup Decision Reached on Soils

In October, the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency and the New York State Department of Environmental Conservation had agreed on the cleanup of contaminated soils at Brookhaven Lab.

The interagency agreement is described in a document titled *Record of Decision: Operable Unit 1 and Radiologically Contaminated Soils*. This document presents the final selected remedy and the rationale for its selection.

In total, approximately 39,000 cubic yards of soil will be excavated, providing the greatest protection of human health and the environment.

The selected remedy calls for excavation and off-site disposal of contaminated soils found in several areas of the Brookhaven Lab site, with the largest volume of soils to be excavated from the former waste-management facility.

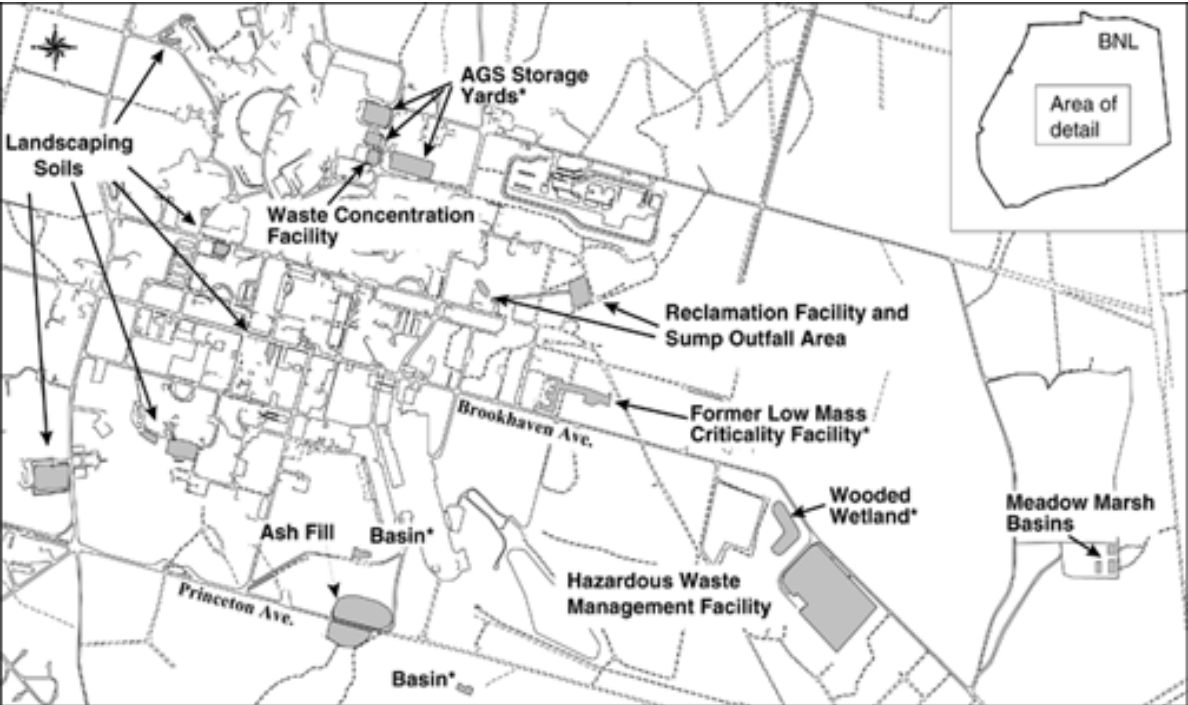
The principal contaminants are radionuclides, primarily cesium-137 and strontium-90. Elevated levels of metals have been found in some locations, as well as volatile organic compounds in groundwater from the lab's former waste-management facility.

To read BNL's press release announcing the OU 1 Record of Decision, go to <http://www.pubaf.bnl.gov/pr/doepr100599.html>.

For the full text of the document, go to: <http://www.oer.dir.bnl.gov/ou1rod.html>.

The Research Library carries a copy of the document.

Contaminated soils on site. The areas labeled with asterisks will be addressed through institutional controls and monitoring. The remainder will be excavated.



Phytoremediation: Cleaning Up With Plants

Can plants clean contaminants out of soil? Mark Fuhrmann, Department of Advanced Technology, posed that question in a Bulletin article last year (May 1, 1998). Given upcoming remediation activities (see box on the contaminated soils' Record of Decision), the Bulletin checked with Fuhrmann to see if he had an answer.

"For certain metals, we are close to the point where phytoremediation can be applied," said Fuhrmann. "For other metals and for radionuclides, we are still in the research stage."

Phytoremediation is the use of plants to clean up contaminants.

Fuhrmann has research data from 1998 and 1999 plantings in two plots directly south of the Medical Department building. The area is contaminated with low-level radioactivity.

In the 1950s and '60s, contaminated soil was used as fill in eight grassy areas around the site. The contamination was so low that radiation survey instruments at the time did not detect it. The areas were discovered in a 1982 aerial radiological survey, and subsequent tests determined that cesium-137 is the major radionuclide present in the soil.

Fuhrmann studied five plants: three species of *Amaranthus* and two species of *Brassica*, all chosen because greenhouse studies with collaborators at the U.S. Department of Agriculture and

Cornell University showed that they take up cesium fairly well.

Although he considers them preliminary, Fuhrmann's two years of data show that one species of *Amaranthus* had peak cesium uptake in July, with a steady drop in successive months. One species of *Brassica*, a type of cabbage, also had fairly good uptake, especially when ammonium nitrate was added to the soil to enhance the release of cesium.

"It may be that we need to plant an early crop of *Amaranthus* and then plant cabbage," said Fuhrmann.

Asked why phytoremediation is not an option in the Record of Decision on contaminated soils on site, Fuhrmann

permission to do his research on areas under their jurisdiction.

Next year, Fuhrmann will test phytoremediation on samples from the sand filter beds at BNL's sewage treatment plant. The contaminants in those samples include metals and radionuclides. "I think plants can take out a higher percentage of cesium from the filter bed sands," said Fuhrmann. "Cesium doesn't stick as well to sand."

He explained that because cesium bonds tenaciously with illite, a mica-like clay mineral found in soil, removing it from soil is a challenge.

"The advantage of phytoremediation is that if it does work, you will have less material to dispose of," said

Fuhrmann. "You dry the plants, which are mostly water, then reduce the volume by compaction or incineration.

"For certain metals, we are close to . . . where phytoremediation can be applied."

replied that the technology is still in the development stage. He added, "People want the contaminants out and out now. With phytoremediation, one would have to use multiple crops, over many years."

Still, his research continues, funded by the DOE's Office of Science and Technology and aided by the cooperation of BNL's Environmental Restoration Division, which gives Fuhrmann

Then you are left with contaminants concentrated in a smaller volume, making it more economical to dispose of in a controlled way."

Already, phytoremediation is being used commercially for certain contaminants. Fuhrmann named an industrial site in New Jersey, where the technique is being applied in soil contaminated with lead from the manufacture of marking pens.

Race Task Force Reports Findings

case by an FBI officer—in what they felt was an inappropriate manner.

Such an atmosphere of distrust "is not going to encourage our international collaborations, which are the centerpiece of what these laboratories are about," says Gerry Bunce of the Collider-Accelerator Department.

Russ Reaver, Manager of the Safeguards & Security Division, notes that determining the validity of people's presence at the Lab under circumstances that may be suspicious is one of BNL police officers' duties.

One speaker commented that

heightened security measures do not necessarily yield better national security. In comparing totalitarian regimes with countries that honor and respect the rights of individuals, Xiao-Qing

The U.S. needs foreign scientists and should continue to invite them.

Yang, DAS, said "America's national security is based on people's hearts, on their loyalty to the country, not on tight restrictions." Yang is a Chinese native who recently became a U.S. citizen.

Two speakers asked for an explanation or retraction of a remark made by Jim Hickok, a Wackenhut employee with the DOE Nonproliferation & National Security Institute at Albuquerque, in a video recently shown to BNL staff.

In the video, Hickok stated "Approximately one third to one half [of foreign scientists] are either professional spies or are . . . coerced or talked into working with their own governments."

Asked to comment on this matter in a telephone interview, Hickok apologized for any misinterpretation, saying he made it clear in his presentation that the U.S. needs foreign

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scientists and should continue to invite them. But he stood by his remark, citing as his sources nu-

merous briefings and papers from the FBI and CIA, as well as a book on *Friendly Spies* by Peter Schweizer.

Hickok clarified that most of the foreign nationals he was referring to are not professional spies, but rather are coerced or talked into bringing back foreign intelligence.

— Karen McNulty

A video of the entire task force presentation and staff comments is available to those who could not attend the all-hands meeting.

To arrange a viewing, contact Sol Rosario, Ext. 6253.

If you feel you have been a victim of racial profiling, then contact Diversity Manager Lorraine Merdon, Ext. 3318 or merdon@bnl.gov.

BNL Lecture

(cont'd)

minerals. The BNCC study of organometallic compounds, including metal hydrides, has been crucial to the discovery of several novel modes of hydrogen bonding.

Tom Koetzle received his Ph.D. in chemistry at Harvard University in 1970, then joined BNL's Chemistry Department and performed research using neutrons at the High Flux Beam Reactor.

He also headed the Protein Data Bank database of 3-D biological macromolecule structures.

In 1998, he retired, and as a BNL research collaborator he continues experiments with the BNCC international team at research reactors and spallation neutron sources in Europe, Japan and the United States.

Coffee and cookies will be available at 3:30 p.m. before the lecture, and refreshments will be served afterwards.

All who would like to join the lecturer at a restaurant off site may call Sabrina Parrish, Ext. 4303, by noon on that day.

— Liz Seubert

Equipment Demo

On Tuesday, November 16, from 10 a.m. to 2 p.m., CTP Wireless will discuss the AT&T corporate cellular rate that it offers BNLeers. Service plans include one with airtime rates of 20 cents per minute, 40 minutes of airtime at \$19.99 per month, and unlimited off-peak airtime for an extra \$4.99 per month. Free features include a digital phone, caller ID, and much more. For more information, call Dennis Lamm, 585-2900.

Hospitality Committee

Susan Hart is the new chair and contact person for the Hospitality Committee. The Committee invites all on-site residents, their spouses and friends to the following events. More details are posted in the laundry room and on the door of the Recreation Building. For more information, call Hart, 821-4257.

Welcome Coffee

Coffee is served to apartment area residents every Tuesday, from 10 a.m. to 11:30 a.m., in the lounge of the Recreation Building in the apartment area.

Parent-Toddler Group

Parents are invited to bring their toddlers to the Recreation Bldg. every Wednesday, 9:30-11:30 a.m. For more information, call Sarah Zill, 821-2602.

Pre-Thanksgiving Turkey

All apartment-area dwellers are invited to a pre-Thanksgiving dinner on Friday, November 19, at 6 p.m. in the Recreation Building. Turkey and beverages will be provided; bring a side dish, salad or dessert to share.

Cafeteria Schedule

After 30 years and about 8,000 daily lunches, the floor in the cafeteria kitchen must be repaired and refinished. To minimize the impact on employees, the work will be done around the Veterans' Day holiday.

During reflooring, the cafeteria will be closed Thursday-Sunday, November 11-14. At that time, service will be available at the Brookhaven Center, Bldg. 30, as follows:

- Thurs., 11/11, 7:30 a.m.-2 p.m;
- Fri., 11/12, 7:30 a.m.-2:30 p.m;
- Sat. & Sun., 11/13 & 14, 7:30 a.m.-2 p.m.

Regular cafeteria service will resume on Monday, November 15.

Retirement Counseling

A TIAA-CREF representative will visit the Lab on Tuesday, Wednesday and Thursday, December 7, 8, and 9, to answer BNL employees' questions regarding the TIAA-CREF retirement plan in one-on-one counseling sessions. Employees might ask:

- How should I allocate my money between TIAA and CREF?
- What are my retirement options?

A limited number of 45-minute appointments are available. To arrange one, call L. Duane Walden, 800 842-2733, Ext. 7289.

No Bulletin 11/12

In observance of Veteran's Day, the Lab will be closed on Thursday, November 11, so there will be no Bulletin on Friday, November 12.

Weight Watchers

Registration for Weight Watchers' 1-2-3 Success Weight-Loss Plan will be held at noon on Wednesday, November 17, in the south dining room of the Brookhaven Center. The special holiday-season fee is \$79 for the 10-week program. For more information, contact Health Promotion Specialist Mary Wood, wood2@bnl.gov, Ext. 5923.

BROOKHAVEN
BULLETIN

Published weekly by the
Media & Communications Office
for the employees of
BROOKHAVEN NATIONAL LABORATORY

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The Camp Upton Historical Collection officially opened its doors just before this year's Memorial Day, in a building that had served as a Camp Upton chapel. The dedication ceremony involved Long Island veterans (pictured above), Laboratory Director John Marburger (right) and BNL employees, who also honored those who served in both World Wars. Before BNL was established in 1947, Camp Upton had been an Army training center for soldiers during World War I and an induction center during World War II.

Overseen by Museum Programs Manager Janet Tempel of the Community Relations Office, the collection holds Army artifacts, including uniforms, photographs and spent munitions. It is open to the public and school groups by reservation and to the general public during BNL's Summer Sunday tours.

Arrivals & Departures

Arrivals	
Holly L. Olsen	Reactor
Pavel V. Poliakov	Chemistry
Tyler B. Rovig	Rad. Control
Eli D. Tchouparova-Petzeva ..	App. Sci.
Departures	
John Mahon	Physics
Patricia E. Oster	AGS
Helga Pieper-Howeling ...	Env. Restor.
Otto Ritter	Biology
Mark C. Sailer	Physics/RCF
Markus W. Schulz	Physics

Call for Crafts

The BNL Art Society invites employees, retirees, guests, facility users, contractors, and their families to submit crafts for the Fall Crafts Show to be held in Berkner Hall, from Monday to Wednesday, November 22-24.

So, hurry to finish your most exquisite craft work for display in the show.

Call Bob Chrien, Ext. 3903, for catalog forms or more information.

Celebrate Diwali, Festival of Lights

To celebrate the Indian tradition of Diwali, the Festival of Lights, the BERA Indo-American Association is once again offering an afternoon of Indian dances and music, and a traditional Indian dinner.

The festival — the last Diwali of this century — will be celebrated on Saturday, November 20, in Berkner Hall. In addition to a Rangoli exhibition, a cultural program held from 3 to 6 p.m. will feature local talent, including dancers, singers, actors, and a costume parade. At 6:30 p.m., the Indian dinner will follow the entertainment.

Tickets are \$11; \$10 for senior citizens and full-time college students; and \$5 for children 5-12 years of age. Buy tickets by Monday, November 15, from: Geeta Joshi-Topé, Ext. 5702; Kumi Pandya, Ext. 7734; Dhruba Ghimiray, Ext. 3849; or Achyut Topé, Ext. 5672.



Among the children who will celebrate in the Diwali cultural program are seven-year-olds Kerishma Panigrahi (second from left), in a "chaniya choli," with "bindi" in her hair, and Priyanka Topé (second from right), in a "nauvari sadi" sari; with three-year-olds Maya Rao (center), and twins Shilpa Iyer and Shweta Iyer, each wearing a "pattu bawda."

BWIS Invites All To Wine, Cheese

All are invited to Brookhaven Women in Science's (BWIS) 20th Year Wine & Cheese Party, on Wednesday, November 10, 5-7 p.m. in the Recreation Building in the apartment area.

BWIS holds this free social event annually to acquaint BNLers and facility-users who may be prospective BWIS members — both women and men — with the group and its accomplishments, activities, and goals.

Over the past 20 years, the group's work has resulted in the establishment of the on-site Teachers Federal Credit Union, coordination of insurance benefits for married BNL couples, a parental leave policy, an on-site child-care center, increased awareness of sexual harassment policy, and, most recently, scholarships for local high school students.

Coffee Truck Service Ends November 10

The Lab's coffee truck service will be discontinued on Wednesday, November 10, since the service cannot financially support itself. The Lab had instituted a number of alternatives and initiatives to increase the number of patrons, but not enough people responded by using the service.

To support customers who depend on the truck for lunch items, Flik International, the Lab's food service contractor, will add "quick pick" sandwiches and soups at the cafeteria starting 7:30 a.m. each workday, effective immediately.

Bowling News

The Mixed League, called the Purple & White League, which bowls on Thursdays in Shirley at 6:30 p.m., is looking for two female bowlers. If you are interested, call Debbie Keating, Ext. 3888. The league is open to all BNL and USB employees, retirees, facility users, on-site contractors, guests, and their families and friends.

On October 5, Eric Larsen bowled another perfect game of 300. Congratulations, Eric!

Red & Green League – October 26
R. Mulderig Jr. 251/220/217/688 scratch series, R. Mulderig Sr. 247/245/214/706 scratch, E. Larsen 266/202/654 scratch, J. Mayeski 241, R. Deem 224, E. Meier 211, G. Miltenberger 207, S. Reynolds 201, M. Grau 200.

Purple & White League – October 28
J. McCarthy 205/193/188, P. Callagari 221,202, D. Reynolds 205, K. Krygier 201, G. Diamantis 197, S. Reynolds 189, T. Dilgen 180, J. Pinelli 179, R. Freeman 177, D. Keating 174, L. Simes 173.

Purple & White League – October 21
J. Zebuda 241/196/612 scratch series, E. Sperry IV 244, J. McCarthy 237, K. Batchelor 215, B. Mullany 209/180, N. Besemer 203, G. Diamantis 192, T. Dilgen 191, T. Mehl 188/178, S. Logan 187, J. Meier 209/201.

Red & Green League – October 19
R. Deem 258/248/205/711 scratch series, R. Mulderig Sr. 268/201/652 scratch, K. Koebel 257/221/658 scratch, R. Mulderig Jr. 236/234/650 scratch, J. Mayeski 210/201/607 scratch, G. Mack 223, E. Meier 215, F. Wahlert 214, M. Grau 214, N. Besemer 209, J. Griffin 200.

Great American Smokeout 11/18

Leave the pack behind and join the Great American Smokeout on Thursday, November 18. If you want help quitting smoking, or if you want to adopt a buddy who needs help quitting smoking, contact Mary Wood, Ext. 5923, or wood2 @bnl.gov.

Rifle & Pistol Club

The BNL Rifle & Pistol Club's next monthly meeting will be Wednesday, November 10, at noon in the AGS second-floor conference room, Bldg. 911. For more information, call Ted Robinson, Ext. 5489, or the club's hotline, Ext. 2658; or go to its Web page at www.berahome.bnl.gov/clubs/rpc/rpc.html, where the club's newsletter is posted.

Classified
Advertisements

LABORATORY RECRUITMENT - Opportunities for Laboratory Employees.

DD6484. OFFICE SERVICES POSITION - Will perform clerical duties associated with the reception area of the Clinic such as handling of the telephones. Additional duties will include scheduling lab and medical exams for employees, completing medical charts, and assisting the administrative staff in various projects. Excellent communication and interpersonal skills required. Knowledge of computers including Word and Web Requisition desired. Occupational Medicine Clinic.

OPEN RECRUITMENT - Opportunities for Laboratory Employees and Outside Candidates.

MK8292. SCIENTIST - experienced in the development of accelerator instrumentation for beam monitoring and control. Requires a Ph.D. in physics or electrical engineering, at least five years' experience in accelerator instrumentation, and strong leadership and communication skills. Will be responsible for the design, construction, installation and commissioning of the systems used to measure the properties of the charged particle beams in the injection transport line, ring and extraction transport lines of the Spallation Neutron Source Project. Under the direction of J.M. Brennan. Collider-Accelerator Department.

MK8297. POSTDOCTORAL RESEARCH ASSOCIATE - to work in the Accelerator Physics Group of the Spallation Neutron Source Project conducting investigation on the optimal working point and the impact of resonance and structure resonance in the presence of magnetic imperfection, misalignment and space charge. Requires a Ph.D. in physics, extensive experience in working at a major laboratory on beam dynamics issues, and familiarity with software development projects, FORTRAN, C, Unix-based and PC-based platforms. Must be capable of original work and be familiar with large-scale codes like MAD and SIXTRACK. Under the direction of J. Wei. Collider-Accelerator Department.

MK7670. POSTDOCTORAL RESEARCH ASSOCIATE - (reposting, 2 positions) to work in the High Energy Theory Group which has active programs in electroweak physics, collider and QCD phenomenology, lattice gauge theories and finite temperature field theory. Requires a Ph.D. in high-energy physics. Under the direction of S. Dawson. Physics Department.

DD8083. ELECTRICAL ENGINEERING POSITION - Requires a BS degree, MS preferred, in electrical engineering, with experience in the design of analog circuits, feedback systems and power electronics. Experience with fast pulsed power techniques and high power thyratrons a plus. Collider-Accelerator Department.

NS8424. GIS ANALYST POSITION (term appointment) - Requires a BS in environmental science, geography, computer science, or other relevant field and proficiency in the use of ARC/INFO software on a UNIX platform, ArcView (any platform), Internet Map Server and Web technology. Excellent communication skills are required; familiarity with Adobe Illustrator, Oracle, or another relational database, or background in programming (C++, Visual Basic, PERL) is preferred. Experience in administration of multi-seat ARC/INFO in a mixed client-server environment is a

plus. Primary responsibilities will focus on map design and production and deployment of map-based applications on the Web; other duties include general GIS administration and maintenance, including coverage creation and updates, and writing and implementing GIS procedures. Environmental Restoration Division.

NS8781. COMPUTER ANALYST POSITION - Requires a bachelor's degree in computer science, or the equivalent, and demonstrated knowledge of multimedia software development and database connectivity. Knowledge of, and experience with, active server page development, JavaScript, HTML, cgi, xml, ODBC and web and graphic design tools is necessary. Will be responsible for technical oversight and leadership of web- and computer-based training course deployment, development, and record capture system for the Laboratory. Training & Qualification Program Office.

NS8019. INDEPENDENT OVERSIGHT SPECIAL STUDIES ASSESSOR - Requires a BS in science or engineering; significant professional experience implementing QA and self-assessment programs, familiarity performing accident investigations and/or causal analysis studies, and excellent communication and technical writing skills. Management and policy development experience is desired, as is experience in work planning and experimental review processes; Malcolm Baldrige experience is a plus. Responsibilities include performing special studies/investigations at the request of management, analyzing performance data to identify trends; reporting results; and following up on identified weaknesses. Will assist in evaluating the effectiveness of Laboratory programs as part of the Independent Oversight Assessment program, which is based on risk, vulnerabilities, past performance, management focus, and achievement of Laboratory objectives. Independent Oversight Office.

DD8454. TECHNICAL POSITION - Requires an AAS degree in a scientific discipline and significant experience in the collection of environmental field samples. Familiarity with sample collection techniques for all media including air, surface water, groundwater, soil, flora and fauna is also required. Knowledge of all aspects of environmental remediation systems including landfill gas monitoring, air stripping, carbon adsorption, soil-vapor extraction required as is knowledge of the operation of automated sample collection systems (ISCO 3700), field investigation techniques (Geoprobe), in situ field test methods, and collection of field data. Strong Interpersonal, oral and written communication skills, and mechanical aptitude required; background in radiation monitoring desired. Environmental Services Division.

DD7825. TECHNICAL POSITION (term appointment) - Requires a BS degree in a physical science (physics, chemistry, engineering) excellent communication skills, and a demonstrated ability to learn to operate complex apparatus and computer software. Experience in the operation of the UNIX computer operating system and in electromechanical debugging and troubleshooting is desirable. Under general supervision will assist users of the Structural Biology beamlines located at the National Synchrotron Light Source in the execution of x-ray diffraction experiments. Responsibilities include the maintenance and repair of apparatus as well as the performance of routine computer operations. Biology Department.

DD8755. STEAMFITTER A (term appointment) - Under minimum supervision lays out, constructs, or installs, repairs and maintains heat, steam and water distribution systems, related facilities and auxiliary equipment and piping and equipment utilizing heat, steam and water distribution services. Plant Engineering Division.

Thanksgiving
is in the
air!



Please share — give
food or \$\$ to the
BNL FOOD DRIVE
Send checks to BNL Food Drive,
c/o R. Kitz, Phys. & Acc., or to
D. Wadman, Bldg. 509.

