

BNL's Booster Expertise Crucial to National Neutron Source

BNL's accelerator-physics expertise and experience in building the Booster — the small but mighty preaccelerator that has helped increase the intensity of the beams produced by the Alternating Gradient Synchrotron (AGS) since 1992 — are now being tapped to help design and construct a new, national neutron source.

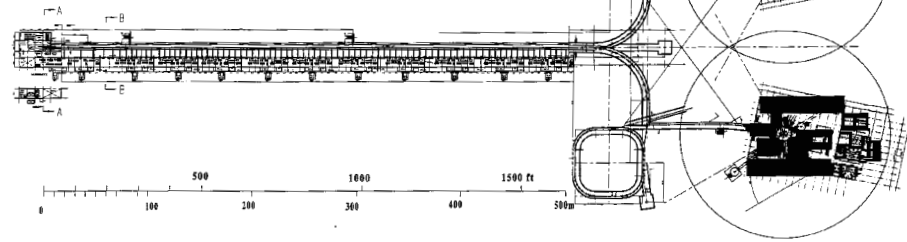
Called a spallation neutron source, this type of accelerator produces pulses of neutron by smashing protons with sufficient energy into heavy-metal targets. This pulsed neutron beam is then aimed at materials within physics and structural biology experiments, to study the structure and phenomena in solids, liquids and gases, and biological molecules.

At present, the majority of neutron sources used for scientific research are reactors such as BNL's High Flux Beam Reactor (which has been shut-down since December, prior to the discovery of a tritium leak from its spent-fuel storage pool; see story below).

While the continuous neutron beam from a research reactor is ideal for mapping specific particle energy and momentum changes, spallation sources, by contrast, produce the pulsed neutron beams which excel at surveys of many different energy and momentum changes simultaneously. While there is some overlap in the capabilities of reactor and spallation-based sources, they are largely complementary.

If built by the Office of Basic Energy Sciences within the Office of Energy Research of the U.S. Department of Energy (DOE) at Oak Ridge National Laboratory (ORNL) in Tennessee, the \$1-billion National Spallation Neutron Source (NSNS), as it has been named, would be the most powerful accelerator in the world that is dedicated to the production of neutrons for these neutron-scattering experiments.

In recent testimony to the U.S. House of Representative's Committee on Appropriations' Subcommittee on Energy & Water Development, Energy Secretary Federico Peña stated that DOE's highest priority for the Office of Energy Research is "to move the U.S. toward international leadership in neutron science . . . because of its importance for fundamental dis-



A schematic of the layout of the proposed National Spallation Neutron Source: (from left) its linear accelerator, beam transport lines, two proton synchrotron rings and beam lines with instrumentation. BNL is designing the rings: The lower ring will be built during the first phase of construction, while the upper ring is planned for phase two.

coveries and practical benefits."

Peña went on to explain that the \$672.2 million requested for Basic Energy Sciences in the fiscal year 1998 budget proposal includes \$23 million for the detailed design of the NSNS at Oak Ridge. If approved, this design can be completed next year, and construction can begin in FY99, to be completed by 2005.

Spallation Around the World

From the perspective of an experimenter who would use this neutron source, "This is truly an exciting project, as it would move the leadership in spallation-neutron spectroscopy back to the United States," comments John Axe, Head of BNL's Center for Neutron Science.

At present, the U.S. has two relatively low power spallation sources dedicated to neutron science: the Intense Pulsed Neutron Source (IPNS)

at Argonne National Laboratory (ANL), and the Los Alamos Neutron Science Center (LANSCE) at Los Alamos National Laboratory (LANL). Great Britain has the highest power

spallation neutron source in the world, though a higher power one is under construction in Japan, and the European Community has proposed building one similar to the NSNS.

To be commissioned with a proton beam having 1 megawatt (MW) of power delivered to the spallation target, the NSNS will be the world's most powerful spallation accelerator. During a second phase of construction, it can easily be upgraded to 5MW, and a second synchrotron ring to the north of the first can be added.

To research and develop this machine, ORNL has, since last year, been coordinating the collaborative efforts of four other national laboratories, including Brookhaven.

AGS Booster-Type Synchrotron

BNL has been charged primarily with design of a 212-meter-in-circumference AGS Booster-type synchrotron, (continued on page 2)

Latest Tritium Results Support Earlier Findings About Plume

Results from analyses completed on samples taken from five of the 12 groundwater monitoring wells located on Weaver Drive to pinpoint the leading edge of the plume of tritiated water coming from BNL's High Flux Beam Reactor (HFBR) show tritium concentrations significantly below the U.S. Environmental Protection Agency's (EPA) drinking-water standard of 20,000 picocuries per liter (pCi/L).

These data support previous findings about the tritium plume's extent and add to the Lab's confidence that the leading edge of the plume is between Rowland Street and Princeton Avenue.

The tritium plume is believed to originate from the HFBR's spent-fuel storage pool. Since groundwater in the area flows south at a rate of about a foot a day, BNL has been installing groundwater monitoring wells in tiers south of the HFBR, and the Lab has been sampling and analyzing the groundwater from these wells since the plume's discovery in January.

Weaver Drive is about half a mile south of the HFBR, and over three-quarters of a mile north of the site's southern boundary. There, the peak concentration of 2,020 pCi/L was found at a depth of 105 feet from among samples taken from 40 to 200 feet below ground level. Results from the remaining seven wells are expected soon.

Results are also now available from 19 of the 22 wells located on Princeton Avenue, which is 720 feet south of Weaver. There, the tritium in the groundwater is below the EPA's drinking-water standard, with a peak tritium concentration of 6,440 pCi/L at a depth of 150 feet.

In addition, data from samples taken from three additional wells on the South Boundary Road, which is 188 feet north of the Lab's southern boundary, show tritium at or below the minimum detection level of 300-400 pCi/L. Previous results from this location were also far below the drinking-water standard.

The tritium plume does not pose any threat to public health, according to the EPA and the Suffolk County Department of Health Services.

Low-Level Tritium Found South of Underground Tank

Tritium has been found at detectable levels that are below the U.S. Environmental Protection Agency's (EPA) drinking-water standard in groundwater samples taken immediately south of a reinforced-concrete underground collection tank, which is located near Bldg. 801, about one-and-a-half miles north of the site's southern boundary.

Preliminary data from one well indicate the presence of other radioactive elements, which are being identified through further analysis and will be reported.

Now drained and sealed, this tank is no longer a source of groundwater contamination, and this area of contamination is not related to the tritium plume originating from BNL's High Flux Beam Reactor (see story bottom left). The groundwater contamination resulting from this tank will be cleaned up as part of the Lab's Superfund remediation. It has not affected any drinking water, and it is not a public health threat.

Results from the seven temporary groundwater-monitoring wells located 45 feet south of the tank show that the peak concentration in one well is 6,900 picocuries per liter (pCi/L) of tritium at 82 feet below ground. Samples from the other six wells showed lower concentrations of tritium, all at levels below the EPA's drinking-water standard for tritium of 20,000 pCi/L.

To determine the extent and depth of the existing contamination, two additional temporary wells have been installed east of the existing seven, and deeper water from two of those seven is being analyzed. In addition, since groundwater in this area flows south, four other temporary wells have been installed north of the tank; if no tritium is found in their samples, then they will help confirm that the tank is the source of the groundwater contamination to its south.

Part of Superfund Effort

Built in the 1940s, the 4-foot by 6-foot by 10-foot-deep tank had been identified by BNL's Office of Envir-

onmental Restoration in November 1996, as part of its ongoing Superfund environmental investigation and remediation effort (see Brookhaven Bulletin, March 21, 1997).

Standing water and sludge were pumped out of this tank in early March, following the detection of radioactive strontium-90 and tritium in the standing water. Analysis of the 750 gallons of standing water also showed the presence of radium-226 and cesium-137. The tank's sludge contained strontium-90, radium-226, cesium-137, americium-241 and cobalt-60.

Both the standing water and the sludge are being processed as hazardous waste.

Until this March, the tank had received drainage from the stack of the High Flux Beam Reactor, the fan house of the Brookhaven Graphite Research Reactor and the radioisotope research laboratories in Bldg. 801.

In addition, rainwater entered the tank through its manhole cover between 1991, when asphalt was removed from the manhole cover, and last month, when the tank was drained and its cover resealed.

It is believed that the tank's standing water seeped into the groundwater through an opening between the concrete and a 14-inch-diameter cylindrical stainless steel duct that runs through the tank about five feet from its bottom. The duct was designed to exhaust gases from the hot lab to the reactor stack, while depositing moisture into the tank.

When the tank's contents reached 30 inches above its bottom, an alarm was supposed to sound and the tank was supposed to drain into an aboveground radioactive-waste collection tank behind Bldg. 801.

Why the underground tank was forgotten and how the responsibility for its operation was lost is being investigated by a four-person committee reporting to Mike Brooks, Deputy to the Associate Director for Reactor, Safety & Security.

— Marsha Belford

VMS Delta-Time Limit Error Coming

The Computing & Communications Division (CCD) is warning computer users regarding an upcoming delta-time limit error that may occur in VAX or Alpha computers manufactured by Digital Equipment Corporation that run the VMS operating system.

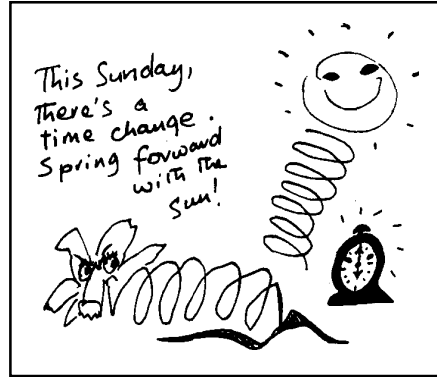
Computers have internal clocks that are used by their operating system to perform various time-related calculations. CCD has been informed about an error relating to delta time, which is time expressed as dddd-hh:mm:ss.cc, where dddd stands for days ranging from 0 to 9999. The problem occurs because the value of dddd is limited to 9999. So, when day 10,000 occurs, it is represented as 0000 instead of 10,000 because there are only four digits to express days.

The OpenVMS operating system has documented such a delta-time limit problem that may cause a serious error in some applications and OpenVMS components on or about this May 19. Applications and OpenVMS components that are most likely to experience this error are those that pass delta-time arguments with values exceeding 9999 days onto system-supplied date routines. The most likely date for this error to occur is 19-May-1997:00:00 because it is 10,000 days after the common UNIX time origin of 1-Jan-1970.

Therefore, Digital recommends that all customers running the affected OpenVMS versions install the appropriate engineering change order (ECO): For OpenVMS Alpha ver-

sions 6.1 through 7.0, the ECO is ALPLIBRO5_070. For OpenVMS VAX versions 5.5 through 7.0, the ECO is VAXLIBRO5_070.

For more information and access to the ECOs, contact Paul Kessler, Ext. 4156 or e-mail kessler@bnl.gov.



Windows NT Meeting

The next meeting of the Windows NT Users Group is on Thursday, April 10, from 1:30 to 2:30 p.m. in the CCD seminar room, Bldg. 515. There, networking concerns for NT systems will be discussed. For more information, contact Ronnie Evans, Ext. 2851, or e-mail nt-support@bnl.gov.

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

Lab Advisory Committee Formed

This past Wednesday, Paul Martin, Chairman of the Board of Trustees of Associated Universities, Inc., announced the formation of a Laboratory Advisory Committee to assist in the search for a new Director for BNL.

Jim Davenport, Department of Applied Science, and Sam Aronson, Physics Department, will serve as chair and co-chair, respectively, of the Advisory Committee. As such, they are also members of the Search Committee.

Other BNLers on the Advisory Committee are: John Axe, Center for Neutron Scattering; Gerry Bunce, Alternating Gradient Synchrotron Department; Joanna Fowler, Chemistry Department; Doon Gibbs, Physics; Henry Grahn, Director's Office; Ruth Kempf, Department of Advanced Technology; William Studier, Biology Department; and Otto White, Safety & Environmental Protection Division.

Martin thanked the many members of the Laboratory community who suggested people to serve on the committee, which is expected to consult widely within the Lab and welcomes employees' suggestions regarding candidates and the qualities that they consider important in a Director.

Neutron Source (cont'd.)

in which the one-microsecond-long pulses of protons will be accumulated, so as to deliver 20 trillion protons per pulse (ppp) to the spallation target at a 60-hertz (Hz) pulse rate.

When the NSNS is upgraded to 5 MW, a second synchrotron north of the first will be built, so more beam lines for neutron-scattering experiments can be added.

Having designed and built the 200-meter, 2-trillion ppp, 7.5-Hz AGS Booster, the AGS accelerator-physics staff is the obvious choice to perform the conceptual design for the NSNS accelerator rings themselves.

From the point of view of an accelerator physicist who is designing the NSNS ring, "As a result of our building the Booster and upgrading the AGS, designing this high-intensity proton synchrotron is the right contribution for us to make to this national project," says BNL Senior Physicist and NSNS Ring System Team Leader Bill Weng, who had managed the AGS Booster Project and formerly headed the AGS Accelerator Division.

Adds Weng, "The NSNS' parameters, which are very similar to those of the AGS Booster, combined with its very different purpose and its demanding performance requirements, make this accelerator-design project very interesting and challenging."

Meanwhile, Lawrence Berkeley National Laboratory is conceiving what is called the front end of the accelerator, which includes the ion source; LANL has responsibility for the linear accelerator, which will accelerate the proton beam to an energy of 1 billion electron volts.

ORNL and ANL are designing the liquid mercury spallation target, the neutron moderators, and the transport lines to bring the resulting neutron beam to the experiments; and ANL is planning the neutron-scattering guide hall and instruments for use in experiments to be located at the end of 18 neutron beam lines.

Three Departments Involved

At BNL, three departments are involved in the project: First and foremost is the AGS Department, which is undertaking the majority of the ring's design, as well as managing BNL's participation.

"With our extensive experience in high-intensity proton accelerator design, the AGS Department is pleased to lend our considerable expertise to this nationwide design venture and lead BNL's interdepartmental team effort to develop the synchrotron-ring concepts that will underlie the design and construction of the nation's highest-power spallation-neutron source," says Derek Lowenstein, Chair of the AGS Department.

Meanwhile, the design for the ring control-system hardware and software is being conceived within the department now managing one of the nation's premier synchrotron-light sources,

BNL's National Synchrotron Light Source. And the beam collimation and radiation shielding are being designed with the Lab's Department of Advanced Technology.

The five labs are to present the NSNS Conceptual Design Report to DOE by this May. During June, the Office of Energy Research will review the report's cost estimate, construction schedule, technical feasibility and expected performance projections so it can support its request to fund the building of the NSNS to the administration and Congress with evidence that this project is reasonable and highly likely to be completed within the planned cost and schedule.

Neutrons by Acceleration

In the 1960s and 70s, DOE's Office of Basic Energy Sciences pioneered the development of research reactors, such as BNL's High Flux Beam Reactor, as sources of intense neutron beams.

Since then, however, the Europeans and Japanese have not only designed new research reactors and upgraded old ones to produce even higher flux neutron beams, but they have also taken the lead in the use of accelerator technology for the pulsed production of neutron beams for spectroscopy.

Such accelerator-based pulsed neutron beams are produced by what is called spallation. Spallation is a nuclear reaction in which incoming protons or nuclei collide at high energy with other nuclei, violently shattering them and, in the process, primarily producing individual nucleons, including an abundance of neutrons.

Reactor-based neutron sources, on the other hand, produce a continuous flux of neutrons by a chain reaction in the core of fissionable fuel.

While DOE had been planning to build what was called the Advanced Neutron Source, it canceled this research-reactor project in its 1996 budget submission to Congress, citing its large, \$3-billion projected cost. Instead, DOE requested \$8 million in 1996 and again in 1997 to undertake the conceptual design of the NSNS, which Congress approved.

DOE's Office of Energy Research selected ORNL to lead the conceptual design and as the preferred site of the NSNS. To accomplish the NSNS design, ORNL enlisted the four other national laboratories.

"The NSNS collaborative arrangement is the best approach for utilizing the expertise of DOE's national laboratories to complete the conceptual design of this major facility economically and within a short period of time," notes Bill Appleton, who is the acting NSNS project director and an ORNL associate director.

If the U.S. Congress funds the NSNS as a construction project, then this ORNL-led collaboration will carry out the construction and commissioning of the NSNS as well.

— Marsha Belford

50 YEARS AGO THIS WEEK

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

• **April 1, 1947** — BNL issues its first quarterly reports: one on administrative matters and one on scientific progress. The administrative report includes the following highlights:

"... [C]ontacts have been established with about [200] additional prospective members of the scientific staff. There are now approximately [500] names in the scientific personnel files and... interviews have been held with about [100]..."

"Full-time appointments have been offered to 29 scientists and engineers. Twelve of these have been accepted and 11 are still pending. In addition, 22 scientists have been offered appointments as part-time consultants. Of these, 15 have accepted and six are still pending."

"... The Laboratory now has the responsibility for maintenance of a site comprising some six thousand acres and nearly four hundred buildings. It has been held in standby condition, but is rapidly being transformed through the activation of additional laboratories as the organization grows, and it is expected that additional staff... will be necessary during the next month or two."

"We have been more successful in locating both non-technical and semi-skilled personnel in the immediate vicinity than had been anticipated. Curtailment in the operations of Sperry Gyroscope Company, Grumman and Fairchild has been a factor in this and we are apparently just ahead of the expected competition from Bendix and Lockheed in the development of MacArthur field near Sayville. [So] the rate of recruiting anticipated in the Initial Program Report (about fifteen new staff members per week) has recently been exceeded..."

"... The magnitude of the entire housing problem led us to employ a full-time man... to assist individual new employees in getting located and to aid in development of plans for the long-range housing program... The need for temporary housing during the coming summer makes it increasingly obvious that modification of buildings at the site is the only practical alternative that can provide the necessary quarters in time... Consequently, the Department of Architectural Planning is

developing a proposal to alter a number of buildings in the Infirmary Area at the southwestern portion of the site to provide furnished apartments for temporary occupancy..."

"The initial two buildings occupied at the time when the staff moved to the site have long since proved inadequate to house the growing staff and the ever-expanding research and administrative activities. Plans for the alteration of six additional buildings are under way and... minor alterations have been made to other temporary frame structures to provide office space... One of the mess halls... has been converted and is operating as a cafeteria through contract with a concessionaire... Sorting and inventorying of the large quantity of material on hand in the warehouses is under way and additional equipment is on order to activate the general machine shop as soon as the necessary alteration of an existing gymnasium can be accomplished."

"The Personnel Division has under study, in collaboration with the officers of the corporation, plans for Group Insurance, for hospitalization and for an employees' retirement program. Some thought has also been given to the establishment of an employees' organization..."

"Every Tuesday afternoon a colloquium has been held at which semi-popular and unclassified talks are given by members of the scientific staff to aid in indoctrinating the junior members of the staff and to provide popularly presented information to those unacquainted with the field of atomic physics..."

"... [T]o inform research institutions in the [northeast] regarding the status of the program, conferences have been held at the University of Pennsylvania, at Yale, at MIT and at Johns Hopkins... At Philadelphia attendance numbered approximately 30, at New Haven 175, at Boston nearly 500 and at Baltimore approximately 60. Within the next few days a similar meeting will be held at the University of Rochester and arrangements are under way for conferences at Princeton and Yale..."

(Next: highlights of BNL's first quarterly scientific progress report.)

The Winners Are...

Deborah Botts, Division of Contracts & Procurement, and John McCaffrey Jr., Relativistic Heavy Ion Collider (RHIC) Project, have been elected to the Executive Board of the Brookhaven Employees Recreation Association (BERA).



Deborah Botts



John McCaffrey Jr.

Chosen by BERA members in elections held the week of March 24, they will replace outgoing BERA Executive Board members August Hoffman, Physics Department, and Bridget Ramos, Department of Advanced Technology.

On May 1, Botts and McCaffrey will join the other six Executive Board members: Patti Bender, Plant Engineering Division; Charles Gardner, Alternating Gradient Synchrotron (AGS) Department; Bob Marascia, AGS; Ed Meier, Physics; Luis Nieves, Siemens Rolm Communications; and Edward Sperry IV, RHIC.

Atlantic City Trip

The next BERA-sponsored, one-day trip to Atlantic City will be to Trump Castle Hotel and Casino on the marina, on Saturday, May 17. The initial cost will be \$23, but the hotel-casino will give a \$12.50 deferred voucher.

The bus will leave the Brookhaven Center at 8 a.m., with an extra pickup at LIE Exit 63, if requested. As usual, there will be free rolls and donuts on board; bring your own juice and coffee. After a six-hour stay in Atlantic City, return will be about 10 p.m.

Buy tickets now at the BERA Sales Office in Berkner Hall, weekdays, 9 a.m. to 1:30 p.m. For more information, call Andrea Dehler, Ext. 3347, or M. Kay Dellimore, Ext. 2873.

Arrivals & Departures

Arrivals

Michael P. Wooley.....Plant Eng.

Departures

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

Roger C. Bailey.....Plant Eng.
Gerard Breidenback.....Adv. Technology
Andrew F. Brems.....Info. Serv.
Rose Marie Busch.....Fin. Serv.
Felecia M. Cummings.....Biology
Leonid Flaks.....NLSL
Pamela J. Giggie-Accetta.....Fin. Serv.
Walter B. Grossman.....Adv. Technology
Victoria F. Johnson.....Adv. Technology
Vishwas N. Joshi.....Medical
Darryl G. Kaurin.....Safety & Env. Prot.
Szu-Cherng Kuo.....Applied Science
Xing Zhang.....Biology

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BERA Concert — Encore for Marc-André Hamelin

Last December, pianist Marc-André Hamelin had performed in concert with his wife, Jody Karin Applebaum, in a "Classical Cabaret" at BNL. On Sunday, April 13, Hamelin, the first-prize winner of the 1985 Carnegie Hall American Music Competition, will return for an encore: He will give a solo concert at 2 p.m. in Berkner Hall.

A native of Canada and the recipient of several awards from the Canada Arts Council, Hamelin studied at the Vincent d'Indy School of Music, then emigrated to the U.S., and earned his bachelor's and master's degrees in music from Temple University.

"A supervirtuoso," according to Harold Schonberg of *The New York Times*, Hamelin has recorded almost 30 compact discs, and his recording of Charles-Valentin Alkan's *Concerto for Solo* call Ext. 3550 for a recorded message. — Diane Greenberg



Marc-André Hamelin

Piano received 1993 nominations for both the Grammy and Gramophone Record of the Year.

The program for the upcoming concert consists of Charles Ives' Piano Sonata No. 2, "Concord, Massachusetts, 1840-1860"; Johann Sebastian Bach's Organ Prelude and Fugue in D Major (transcribed for piano by Ferruccio Busoni); and Max Reger's Variations and Fugue on a Theme of Bach, Op. 81.

Purchase tickets at the BERA Sales Office, from 9 a.m. to 1:30 p.m., weekdays, or at the door on the afternoon of the performance. Early arrival assures the best seats. Tickets cost \$14 general admission, \$9 for seniors, and \$5 for students and youths under 18.

For more information about the concert, including any cancellation due to weather, call Ext. 3550 for a recorded message. — Diane Greenberg

Meetings Planned For All BNLers

To address concerns about current issues affecting BNL, the communications arm of the Lab's Tritium Remediation Project is holding meetings throughout April with employees in all departments and divisions and with other concerned groups on site.

The meetings continue today with employees from the **National Synchrotron Light Source Department** gathering in the seminar room of Physics, Bldg. 510, at 11 a.m.

Meetings next week are as follows:

- Mon., Apr. 7, **Department of Advanced Technology**, 11 a.m., Berkner Hall.
- Mon., Apr. 7, staff and parents of children in the **Child Development Center**, employees of the **Safeguards & Security Division (S&SD)**, and **other shift workers**, with supervisory concurrence, 7 p.m., Berkner Hall, Room B.
- Tues., Apr. 8, **Safety & Environmental Protection and Instrumentation Divisions**, 11 a.m., Berkner Hall.
- Wed., Apr. 9, **Alternating Gradient Synchrotron Department**, 11 a.m., Snyder Seminar Room, Bldg. 911A.
- Thu., Apr. 10, **Chemistry Department**, 11 a.m., Hamilton Seminar Room, Bldg. 555.
- Fri., Apr. 11, **S&SD**; employees of **Flik** and **other contractors** working on site, 2:30 p.m., Berkner Hall.

Future meetings will be listed in the Bulletin on the Friday before they are scheduled.

Rifle & Pistol Club

The Rifle & Pistol Club meets on the second Wednesday of each month, so the next meeting is April 9, in Room 202, Bldg. 911B, at noon. For more information, call Otto Jacobi, club president, Ext. 3471.

Join BERA League III

If you just want to have a good time playing softball and don't care if you win or lose, then consider joining BERA League III softball, which differs from other leagues within BERA's Softball League are as follows:

- BERA members, women and men, regardless of their softball skills, are invited to join a League III team, and every team member who wants to play gets to play, regardless of ability;
- Though men and women will play on the same teams, BERA Mixed League rules will not be followed. This means that men and women don't have to alternate turns at bat, a team can have as many women players as it can recruit, etc.;
- No games are forfeited. So, if a team doesn't have enough players to play a game, then it borrows some from other teams so the game can go on; and
- Masters' rules are followed, so there is no contact at home plate.

If you want to join a League III team, then call: Jim Durnan of the Bombers, Ext. 4617; Bob Marascia of the Sultans of Swat, Ext. 7779; Doug Paquette of Medical, Ext. 7046; or Steve Eckhoff of Sure Fire, Ext. 4414.

Groundwater Demo At Info Center

Jan Naidu of the Safety & Environmental Protection Division will bring the groundwater model that he helped design and build to the HFBR Tritium Remediation Information Center in Berkner Hall, next Friday, April 11, from noon to 1 p.m.

This simulated cross-section of Long Island offers a hands-on opportunity to learn about groundwater movement and pollution.

The information center provides current information and maps showing the status of the HFBR Tritium Remediation Project. It is updated as new information becomes available.

Spring Fling

Spring has sprung, so it is time for BERA's second seasonal TGIF party: The Spring Fling will be held on Friday, April 18, at the Rock Hill Country Club, off Clancy Road in Manorville, starting at 6 p.m. The cost is \$5 to cover hors d'oeuvres and entertainment; a cash bar will be available. The party is open to all BERA members and their friends, and no reservations are required. For more information, call Charles Gardner, Ext. 5214.

Buy Savings Bonds While Getting Paid

Beginning in May, BNL employees will be able to purchase U.S. Savings Bonds through payroll deduction. This new benefit will be facilitated by National Bond & Trust Company, whose representatives will be in the lobby of Berkner Hall on Tuesday, Wednesday and Thursday, April 8, 9 and 10, from 11:30 a.m. to 2 p.m., to provide details about the savings-bond program.

Tennis Anyone?

The BERA Tennis Committee is again sponsoring the following two popular activities. Sign up at the BERA Sales Office, weekdays, 9 a.m. to 1:30 p.m., in Berkner Hall.

Bus Trip to U.S. Open

The 1997 bus trip to the U.S. Open Tennis Championships at the National Tennis Center, Queens, will take place on Tuesday, September 2. The bus will leave from the tennis-court parking lot at 8:30 a.m., with a pickup at the Long Island Expressway Exit 63 park & ride. After the day's session, the bus will leave the National Tennis Center at 7 p.m.

The per-person cost of \$54 includes the day-session ticket, which is now \$39, and the round-trip bus fare, including a tip for the driver. Paid reser-

Outreach Lecture Just Do It!

If you want to put off reading this article until tomorrow, then the Outreach lecture it describes is for you!

"It's About Time! The Six Styles of Procrastination and How to Overcome Them" will be discussed by clinical psychologist and popular author

Linda Sapadin next Friday, April 11, at noon in Berkner Hall. Sponsored by the Employee Assistance Program (EAP) of the Occupational Medicine Clinic, the lecture is open to all and will be available afterwards on audio-cassette in the Research Library.



Linda Sapadin

By tracing the patterns of procrastination to personality traits and early family dynamics, Sapadin has identified six types of procrastinators: the Perfectionist, the Dreamer, the Worrier, the Defier, the Crisis-Maker and the Overdoer. After helping audience members to understand their personal mix of these styles, Sapadin will discuss suitable techniques for overcoming procrastination.

Linda Sapadin, Ph.D., is an adjunct professor at Hofstra University and has a private practice in Valley Stream. Her work has been featured in, among other publications, *The New York Times*, *Cosmopolitan* and *Good Housekeeping*. Published last June by Viking Press, her book, *It's About Time! The 6 Styles of Procrastination and How to Overcome Them*, was a selected feature of the Quality Paperback Book Club and the Money Book Club.

To register for this workshop, return the completed bottom portion of the Outreach flyer recently sent to all employees to EAP to Staff Psychologist Dianne Polowczyk, Bldg. 490, by Thursday, April 10. For more information about EAP, call Ext. 4567.

ventions are now being taken.

1997 Tennis Ladder

The Tennis Ladder will begin on Monday, April 7, to run until Daylight Saving Time ends.

During the first two weeks, open challenges are allowed at any level of the roster. After that, a player may only challenge players on the same rung or one rung higher.

The challenger is expected to provide a new or only once-used can of tennis balls. Unless players agree beforehand to another scoring system, the first player to take eight games wins; a 12-point tie-breaker will be played in the even that the score is tied at 7-7.

To sign up, pay the \$1 fee now. For more information on the rules and format, contact Joe Carbonaro, Ext. 5139, or e-mail carbona1@bnl.gov.

Cooking Exchange

If you have recently arrived on site and want to meet your apartment-area neighbors, then attend the next monthly Cooking Exchange potluck luncheon. It will be held in the Recreation Building on Thursday, April 10, from noon to 1:30 p.m. All on-site residents, including children, are invited. To attend, simply bring a favorite dish to share and a hearty appetite to sample cuisine from around the world.

For more information, call Vicky Chang, Ext. 1064.

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, 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, under "Information," select "Jobs." For scientific staff openings, select "Scientific Personnel Openings"; for all other vacancies, select "General Personnel Openings."

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

NS 4041. ELECTRICAL SUPERVISOR - Will be responsible for first-line supervision in the electrical shop. Will direct electricians including assignment, training, scheduling, and technical direction; will coordinate all work, maintain records and reports, and supply technical assistance and information. Plant Engineering Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

NS 4512. PHYSICIST/ENGINEERING POSITION - Requires a PhD in physics or a master's degree in electrical engineering, and experience or background in some of the following: lattice modeling, orbit control, injection optimization and the study of beam-intensity limiting effects. Experience in the development of related hardware and diagnostic equipment, as well as skills developing software application programs, is desirable. Will work on the operation and improvement of the existing NSLS storage rings. National Synchrotron Light Source Department

NS 6191. ACCELERATOR ENGINEER-IN-TRAINING POSITIONS - (term appointments) Requires BSEE or MSEE and an interest in gaining hands-on experience in the diverse particle accelerator environment. Areas of involvement include instrumentation, digital and power electronics, and radio-frequency techniques. Alternating Gradient Synchrotron Department/RHIC Project.

DD 4042. HEAVY EQUIPMENT MECHANIC-OPERATOR - (temporary appointment) Under minimum supervision maintains, operates and repairs all material handling, earth moving, road and ground maintenance, and similar equipment, including complete repair and maintenance of gasoline and diesel engines and the use of required machine tools. Plant Engineering Division.

DD 3647. SECRETARIAL POSITION - (term appointment) Requires administrative and technical secretarial skills; a working knowledge of WordPerfect 6.1 and office practices and procedures; and demonstrated excellent communication skills. Knowledge of BNL IPAP Travel System is desirable. Duties will include preparing technical reports and correspondence, scheduling appointments, making domestic travel arrangements and maintaining office files. Must be able to adapt to changing priorities and work on multiple tasks. Will perform duties for the Head of the Safety and Risk Evaluation Division and provide some assistance to the Group Leader of the Integrated Risk Assessment Group. Department of Advanced Technology.

MK 4107. ADMINISTRATIVE POSITION - (part-time - 60 %) Requires experience in processing U.S. visas, specifically H-1B and Permanent Residence categories, and excellent oral and written communication skills. Overall knowledge of INS policies and practices highly desirable; a bachelor's degree is preferred. Will be responsible for preparing H-1B petitions and Labor Condition Applications, and for assembling documentation for Permanent Residence applications for employees. Human Resources Division.

NS 5022. ENGINEERING POSITION - Requires a bachelor's degree (an advanced degree preferred) in a relevant discipline or its equivalent, substantial experience in quality-assurance programs and excellent oral/written communication skills. Knowledge of DOE requirements and hazardous-waste management is highly desired. Will be responsible for the QA programs and provide guidance on Price Anderson Act Amendment compliance for the Hazardous Waste Management Section of the Division. Safety & Environmental Protection Division.

Volleyball

Standings as of March 21

Open League		League I - playoffs	
Shank Carry&Throw	50-19	Set to Kill 3	
Far Side	41-25	versus	
Pass, Set & Crush	36-33	Net(e)scapers 1	
Spikers	22-47		
Death Volley	18-51		
League II		League III - final	
Spiked Jello	41-13	Silver Bullets	60-3
Safe Sets	40-14	Group Sets	41-22
Fossils	33-21	Just 4 Fun	37-26
Jao-About-That	32-22	New Comers	35-28
Monday Nite Live!	30-24	Upton Ups	33-30
Lift Carry Throw	22-32	Night Court	17-16
Nuts & Bolts	17-37	Court Hogs	20-41
Jolly VOLLIES	10-44	OER	8-55

Basketball

Games on March 27

PE Wolfpack 84		Knicks 51	
Wayne Cummings	22	Andy Byers	13
Jerry Hobson	20	Mike Mallardi	11
Rob Singleton	14	Ed Gregory	9
Charlie Edwards	9	Rob Wells	7
Darren Harris	9	Chris Rissland	5
Brian Hobson	6	Tomas Iglesias	4
Jim Desmond	4	Dan Delgado	2
<i>Three-point shots:</i> J. Hobson (4), Mallardi (3), Byers, Rissland.			
Magic 64		Scram 61	
Terry Buck	24	Jim Rank	16
Jerry Gaeta	12	Tim Powers	10
Ray Jackson	9	Steve Nappi	9
Hector Machado	6	Joe Barkwill	6
Greg Mack	6	Al Boerner	6
Chris Ingoglia	5	Steve Jao	5
Al Langhorn	2	Gerry Shepherd	5
		Pat Moylan	2
		John Skonieczny	2

Bowling

Results from week of March 24 Red and Green League

W. Powell 226/216/212/654 scratch, R. Mulderig Sr. 263/253/708 scratch, D. Fisher 258/225/666 scratch, K. Asselta 247/244/672 scratch, G. Mack 225/210/620 scratch, R. Raynis 224/206/614 scratch, E. Larsen 203/201, H. Arnesen 236, G. Weresnick 235, R. Prwivo 225/609 scratch, A. Pinelli 234, E. Meier 233, R. Mulderig Jr. 231/623 scratch, J. LaBounty 228, J. Meier 216, J. Toner 216, R. Wiseman 213, O. Mirjak 212, K. Koebel 205, E. Sperry IV 201.

Purple and White League

J. Zebuda 267/252/212/731 scratch, G. Mehl 248/202/620 scratch, Doug Fisher 244/239/633 scratch, R. Raynis 234/232/210/676 scratch, T. Mehl 230/172, M. Meier 215/191, B. Tozzie 213/192, K. Riker 203/186, J. Meier 191/183/183, N. Besemer 188/182, Don King 185/184, M. Picinich 173/173, E. Sperry III 214, P. Callegari 212, P. Manzella 188, R. Picinich 186, M. Addressi 184, C. Johnson 183, R. Flack 179, Donna King 174.