

Instrumentation Custom-Tailors Detector Circuits for Experiments

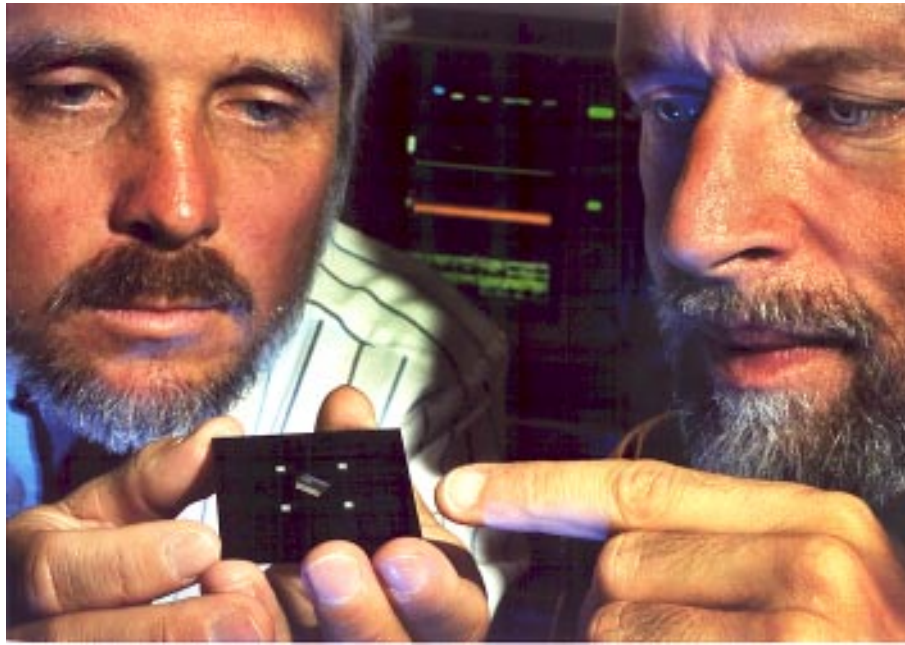
Huge detectors have the big job of finding small particles.

The workhorses in these massive detectors are thousands of tiny silicon chips like the ones in your computer, wristwatch or microwave. Some of the thousands of monolithic chips are specially designed here at BNL to glimpse the evasive particles as they rush by.

"We try to develop circuits that are somewhat novel," explained Paul O'Connor, a physicist in BNL's Instrumentation Division. "We do this by participating in the early phases of detector research with our colleagues in the scientific departments at the Laboratory."

Designing, testing and manufacturing these specialized chips can take years, but the benefits to the experiment more than offset this long lead time, said engineer and chip designer Joe Harder.

The scientists in Instrumentation have already been working on chips for the PHENIX and STAR detectors at



The Instrumentation Division's Joe Harder (left) and Paul O'Connor examine one of the tiny monolithic chips they are designing for a huge detector for the Relativistic Heavy Ion Collider.

— Photos in this issue by Roger Stoutenburgh

the Relativistic Heavy Ion Collider (RHIC) for several years, Harder said. They have also worked on chips for gigantic detectors that will be used at the Large Hadron Collider being built at CERN, the European laboratory for particle physics, and for other experiments inside and outside BNL.

The Process of Chip Design

Circuit designers begin their work by talking to physicists about what function the chips need to perform.

"The early process of the design is verbal and written interaction," Harder said. "It's important to have a solid specification before starting work on such a complex chip."

The chips are custom-designed with the performance of the detector in mind, and several features are especially important in the detection. Low background noise allows clear signal amplification, and low power both saves energy and reduces the amount of heat that the chips generate.

Harder said reliability is essential: "No one would want to shut down in the middle of a run to replace chips," he explained.

Detector circuits need to be thin so they do not deflect the particles from their original course, O'Connor remarked. He also said the space between chips needs to be minute so that few particles can slip through undetected.

The chips will be used to measure energy and position of particles, and to convert this information into digital "ones" and "zeros" that are understood by computers.

1/225 As Big As a Stamp

About two years ago, initial design of the chips for PHENIX and STAR began, using a computer layout program. Detector circuits can contain thousands of transistors, and each chip was designed to fit in a space one-225th the size of a postage stamp.

"You design the chips piece by piece," Harder said. "It is not a quick process."

The circuits then were tested using computer models. Once they performed to specifications, the chip de-

(continued on page 2)



Bob Casey in front of the Peconic River at BNL.

Brookhaven Lecture: Assessing BNL's Radiological Releases

Some Long Islanders believe that BNL's radiological emissions — a normal part of its operations — may pose an environmental and health hazard.

The Laboratory views these environmental concerns with the utmost seriousness, and, at the next Brookhaven Lecture, W. Robert Casey, Head of the Safety & Environmental Protection Division (SEP), will address them. Entitled "Brookhaven National Laboratory's Radiological Releases and Their Impact on Long Island's Environment," his talk will be held in Berkner Hall on Wednesday, September 18, at 4 p.m.

After an introduction by M. Sue Davis, Associate Director for Reactor, Safety & Security, Casey will review the history of radiological releases from Brookhaven's facilities and discuss their environmental impact on Long Island. He will also review the Lab's monitoring program, which routinely keeps track of radioactive releases in order to confirm that BNL operations comply with local, state and federal regulations.

Casey will base his talk on current and past radiological data on water, air, soil, vegetation and wildlife collected both on and off site. He will also compare radiation doses resulting from Brookhaven's releases with other common sources of radiation exposure. (continued on page 2)

What They're Saying . . .

Grossman Dwells on Reactors

Based on documents obtained through the U.S. Freedom of Information Act, I've been writing about admissions by Brookhaven National Laboratory (BNL) and its owner, the U.S. Department of Energy [DOE], that a severe nuclear accident could occur at the two reactors at BNL and seriously impact the lives of Long Islanders.

— Columnist Karl Grossman

In this introductory paragraph from his column that appeared in the *Southampton Press* and other east-end newspapers on August 29, Karl Grossman dwells on the accident potential of BNL's 30-megawatt (MW) High Flux Beam Reactor (HFBR) and 3-megawatt Brookhaven Medical Research Reactor (BMRR).

What Grossman fails to mention, however, is that there is *no credible scenario* at the HFBR, nor at the BMRR, that would result in a condition of general emergency affecting people off the Lab site.

This column was the third in a

series that Grossman has been running about the alleged dangers of BNL's reactors.

In his column of August 22, Grossman describes three categories for possible operational emergencies at BNL: alert, site area emergency and general emergency. And he points out that the Local Emergency Plan for the HFBR, from which he quotes, says that the condition of a "General Emergency" involves the possibility of the "general public" on Long Island being impacted by radioactive poisons from a major accident at either of the two reactors.

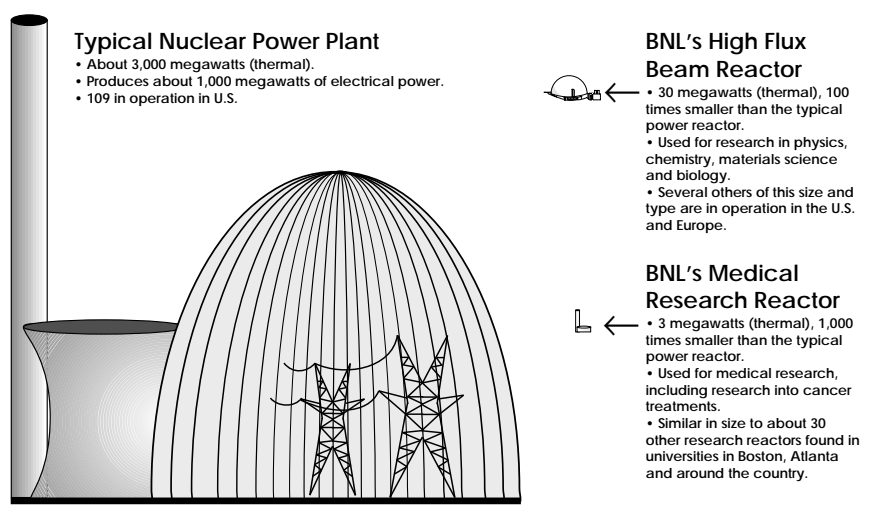
What Does It Mean to the Public?

According to Frank Marotta, Emergency Services Manager in the Safety & Environmental Protection (SEP) Division, and SEP Project Engineer Sheila Bubka, DOE automatically classifies any reactor that operates above 20 MW as a class A reactor, with potential for a serious off-site accident.

How Big Are BNL's Reactors?

Brookhaven National Lab has two research reactors, both many times smaller and less powerful than a nuclear power reactor. The Lab's reactors are also designed for a different purpose than power reactors: Instead of maximizing the amount of heat that can be generated by the reactor core, BNL's research reactors

maximize the number of subatomic particles called neutrons that can be used by scientists to study metals, ceramics and biological molecules, and to develop new cancer therapies. Here's a comparison of the thermal power level (not the actual size) of BNL's research reactors and a typical nuclear power reactor.



But at 30 MW — and even at its optimum design power of 60 MW — the HFBR is at the very low end of a scale on which the power of reactors can, and does, reach into thousands of megawatts. In fact, a typical power reactor, if rated in *thermal* megawatts, as the

HFBR is, would operate at 3,000 MW.

The HFBR has three separate, independent barriers to prevent fission products from escaping: fuel cladding, the sealed metal covering the uranium fuel; the coolant piping system (continued on page 2)

BNL Lecture (cont'd.)

BNL is one of 1,227 sites nationwide that is on the U.S. Environmental Protection Agency's (EPA) National Priorities List, a roster of sites that are considered high priority for cleanup under the federal Superfund Program. The Lab's inclusion on the Superfund list is due primarily to past waste disposal practices, which complied with the regulations existing at the time, but resulted in groundwater and soil contamination at several locations on the Lab site.

As Casey will explain, because the Lab is located atop one part of the vast underground aquifer that is the sole source of drinking water for Long Island, BNL is particularly vigilant about monitoring its liquid discharges to the environment. In fact, BNL has voluntarily established administrative controls to keep liquid discharges below the limits established by the EPA's Safe Drinking Water Act.

Casey will provide data collected by SEP on tritium, cesium and strontium releases to the Peconic River. Releases to the Peconic from the Lab's sewage-treatment plant are monitored every day, and, in other areas both within and outside of the Lab's boundaries, on a quarterly basis.

Casey will emphasize that radiological releases to the Peconic River have been well within local, state and federal guidelines since the 1950s, when these measurements were first taken, and that the river has never been harmed by Brookhaven's operations.

To put the Lab's radiological releases in perspective, Casey will explain that the average annual radiation dose received by a typical Long Island resident from both natural and artificial sources is 360 millirems per year. The Lab's radiological emissions contribute just one more millirem per year to that total for a hypothetical

In Memoriam

The following retirees passed away recently:

Alfred Celentano, who worked in the Medical Department for over 26 years, died on March 17, at the age of 83. He had joined BNL on August 27, 1951, as a hospital orderly, and he retired on June 30, 1978, as a research services assistant II.

Arnold J. Losi, who retired from the Plant Engineering (PE) Division on June 30, 1985, died on August 23. He was 76 years of age. He began working at BNL on May 15, 1961, as a senior designer in the Mechanical Engineering Department. After leaving in 1970, he returned in 1976 as a design engineer II in DAS. When he retired from PE, he was a design engineer.

Rudy S. Hodor, a mechanical engineer at BNL for almost 30 years, died on August 27, at the age of 69. He joined the Mechanical Engineering Department on October 10, 1970, and retired from the Department of Nuclear Energy on May 31, 1990.

William A. Rogers, who retired on February 15, 1984, with over 34 years of Lab service, died on September 6. He was 76 years old. He had joined BNL's Purchasing Group on August 1, 1949, as an accounting clerk B. He was a senior clerk on January 1, 1960, when his group became the Division of Contracts & Procurement (DCP). At the time of his retirement, he was a senior contracts specialist in DCP.

Margaret H. Thompson, a BNL employee for 19 years, died on September 7, at the age of 69. She had started in the Biology Department on March 3, 1975, as a biology associate II, then transferred to the Medical Department in October 1984, as a medical associate II. In that position, she left the Lab for six months in 1987, returned for over three years, then left again in 1991. Returning to Biology in October 1991, she again transferred to Medical three years later, then retired on September 30, 1995, as a biology associate II. Thompson, who held a Ph.D. in cytogenetics from the University of Missouri, is survived by her husband Keith H. Thompson, Biology.

1996-97 Brookhaven Lectures

Since research in so many diverse fields takes place at BNL as a multiprogram national laboratory, people working in one area may have little opportunity to learn what is happening in another.

The Brookhaven Lecture Series, founded in 1960, provides such an opportunity. The series is overseen by the Brookhaven Lecture Committee, currently chaired by William Morse, Physics Department, with Robert Crease, Director's Office, serving as secretary.

All remaining lectures in the 1996-97 series, listed below, will be held on Wednesdays at 4 p.m. in Berkner Hall.

Date	Speaker	Subject
Sep. 18	Robert Casey Safety & Environmental Protection	BNL's Radiological Releases and Their Impact on Long Island's Environment
Oct. 16	Samuel Aronson RHIC Project	RHIC Detectors
Nov. 20	Dan Imre Applied Science	Ozone Depletion
Dec. 18	Benjamin Ocko Physics	Surface Physics
Jan. 22	S. John Gately Medical	SPECT in Neural Research
Feb. 19	James Veligdan Applied Science	Flat Panel Laser Display
Mar. 19	Robert Crease Director's Office	History of the Laboratory
Apr. 16	Victor Emery Physics	High Temperature Superconductors
May 21	Norman Sutin Chemistry	Electron Transfer Reactions
June 18	Radoslav Adzic Applied Science	Structure of Electro-Surfaces

All Brookhaven Lectures are recorded on audio- and videotape, which employees may borrow from the Research Library, Bldg. 477.

Karl Grossman (cont'd.)

and reactor vessel; and the HFBR's dome, the confinement building housing the reactor.

An automatic general emergency would be declared if these barriers should ever be breached at the HFBR. But Ray Karol, who leads the Safety Evaluation Group in the Reactor Division, says, "While we are required to describe these accidents, they are just not believable."

So, although the Lab does not plan for a general emergency with off-site effects, it does plan for an evacuation zone with a one-mile radius all around the HFBR. Since this zone lies fully within the Lab site, BNL's worst-case plans are for a site-area emergency.

A site-area emergency would warrant site-wide evacuation. Because the worst-case scenario would require more police and fire/rescue assistance than the Lab's own Fire/Rescue and Police Groups could be expected to handle, and because the simultaneous evacuation of all of the Lab's 3,300 employees would have an impact on traffic outside the Lab, BNL has worked closely with Suffolk County in formulating the Laboratory's Emergency Plan.

Most recently, several BNL and DOE staffers met on July 11 with members of the Suffolk County Executive Office, Department of Health, Fire/Rescue Emergency Services and Police Department, to review the current plan.

What Does It Mean to You?

What does all this mean to BNL employees?

It means becoming familiar with the site sirens — an alert, a continuous signal, means to report to your assembly area; a site-area emergency signal, an intermittent siren, means to evacuate immediately — and these sirens are tested every Monday at noon. It means participating in site-wide evacuation drills periodically. But mostly, it means working comfortably alongside the Lab's two reactors with the confidence that your fellow employees are carefully following stringent regulations in operating both the HFBR and BMRR.

It also means taking pride in these

reactors because Karl Grossman is literally correct: They can and already have seriously impacted the lives of Long Islanders — for the better.

The boron neutron capture therapy being done at the BMRR is helping people with the almost certainly fatal brain cancer glioblastoma multiforme to enjoy a better-quality life, while tin-117m, a compound produced at the HFBR, is bringing sometimes total relief to people experiencing the agonizing pain of bone cancer.

Readily Available Facts

It's also important to note that, while it's true that Grossman has gleaned his selective observations from "documents obtained through the U.S. Freedom of Information Act," he really didn't need to.

person living at the Lab's boundary 24 hours a day.

Other pertinent comparisons Casey may offer: While a bullhead, a type of catfish, from the Peconic typically contains radioactivity in the amount of 1,870 picocuries per pound, a banana has 1,570, and salt substitute contains 200,000. Further, while sediment from the Peconic contains radiation in the amount of 5,100 picocuries per pound, black sand from Fire Island's beaches contains 217,000, and salt to melt ice, which contains potassium chloride, has 197,000. Still, by all government standards, even these larger amounts are considered minuscule and safe.

Bob Casey received his B.A. and M.A. in physics from Vanderbilt University, in 1963 and 1966, respectively. Before joining Brookhaven in 1973, he was a health physicist for the Atomic Energy Commission, a predecessor to the U.S. Department of Energy. Head of SEP since 1988, Casey has served as president of the American Academy of Health Physics, and he has been elected a fellow of the Health Physics Society.

An approximately 20-minute question-and-answer period will follow the lecture, and all are invited to join Casey afterwards for further discussion and refreshments. Those wishing to have dinner with the speaker at a restaurant off site should call Louisa Morrison, Ext. 4654.

— Diane Greenberg

The documents Grossman obtained do not contain admissions — they contain readily available facts. They are not classified and have not been hidden from public view. In fact, in the past few months, BNL has twice covered the basic issues of accidents and emergency planning at the Lab and its reactors publicly, on May 23 and July 15. The public was also invited to tour the HFBR on July 13.

Any employee with questions or concerns about BNL's reactors may call Pam Yerry, Reactor Division, at Ext. 4070. For a confidential reply, send a Tune In! to the Editor of the Brookhaven Bulletin. Orange Tune In! forms should be found in special boxes in most Lab buildings; if yours is empty or you can't find a box, call Ext. 2345 for forms. — Anita Cohen

Get the Facts!

BNL fact sheets are available in the Public Affairs lobby, Bldg. 134, or in large quantities from Quick Copy, Ext. 2950. They cover topics from BNL and the environment to the Lab's role in the Long Island economy.

To make suggestions for new or improved fact sheets, call Ext. 5658.

Instrumentation (cont'd.)

sign was sent electronically to a vendor who manufactured the chips in a microelectronic fabrication process.

Nearly three months later, about a dozen prototype chips came back to BNL to be tested. Usually, the circuits are tested and redesigned several times before the designers and users settle on a final version.

"You want to make sure you have a fully working chip before you make them in bulk," O'Connor said.

O'Connor estimated that PHENIX will contain hundreds of thousands of circuits. Some larger detectors can contain even more.

The circuits are nearly ready to enter the final manufacturing stage in preparation for assembling the detec-

tors in 1998, so they can be ready when RHIC comes on line in 1999. Both chips designed by Harder and O'Connor are undergoing extensive testing in small-scale detector mock-ups. So far, they appear to be meeting all specifications, and no major design changes are foreseen.

Part of the Instrumentation Division's role is to develop advanced, state-of-the-art equipment and unique methods of measurement.

"We see these monolithic circuits as extending a long tradition of supplying sophisticated electronics for the needs of BNL scientists," said O'Connor. "As the microelectronics industry evolves, we will strive to keep pace so that our experimenters can take advantage of the most advanced technology available." — Andrea Widener

Shop Soon

All Supply & Materiel Section stock-rooms will be closed for inventory on Thursday and Friday, September 19 & 20. To give Supply & Materiel sufficient time to prepare for inventory, make all necessary withdrawals of stock before 3 p.m. on Wednesday, September 18.

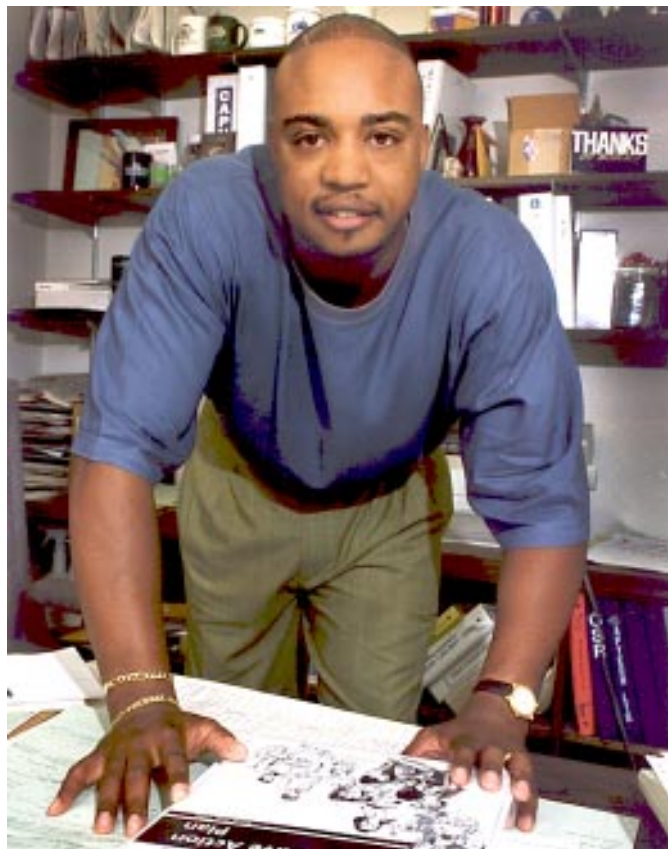
During the inventory, emergency requirements may be processed through John Scharpeger, Ext. 2974.

Toastmasters Club

Whatever your goals in life may be, success may depend on your ability to communicate effectively. The BNL Toastmasters Club offers a good opportunity to develop your communication skills. Have fun and improve your public-speaking ability by joining the Toastmasters at any of their regular meetings, held on the first and third Tuesdays of every month at 5:20 p.m., in Bldg. 475. The next meeting will be on September 17.

For more information, call Mike Butler, Ext. 3430, or Ronnie Evans, Ext. 2851.

Meet Terry Buck — New Chair of A³ Committee



Terrence Buck

BNL's Affirmative Action Advisory Committee, also known as A³, has elected Terrence Buck, a buyer in the Division of Contracts & Procurement (DCP), as Committee Chair. Buck, who joined DCP in March 1991, was nominated to the committee last year.

The charge of A³ is to advise the Laboratory Director on the progress of affirmative action and equal employment opportunities at the Lab. The committee makes recommendations on Laboratory policies, practices and procedures in recruitment, hiring, transfer, promotion, training, education, benefits and labor relations to ensure that minority and women employees are represented fully throughout the work force.

"A³ helps the Lab keep a high level of concern about affirmative action and equal opportunity," said Buck. "I am looking forward to acting with the committee to continue this work. We want to make sure that everyone at BNL consciously recognizes A³ principles and realizes that there is often some extra way that each person can contribute to their success."

"Since A³ is a broad-based committee that seeks to communicate with people from all parts of the Lab," Buck continued, "I invite anyone to call me at Ext. 5475, or come and speak to me or any member of the committee to share ideas or concerns involving our goals. My door is always open — and we'd welcome visits at our regular committee meetings, which are held every third Thursday of the month at 1:30 p.m."

Call Buck for the meeting locations, which vary each month. — Liz Seubert

C-W Dance Club

Phone in your vote now if you want to take part in Tuesday evening country-western dance lessons on site with the BERA Country-Western (C-W) Dance Club.

Call Marilyn Johnson, club president, Ext. 2546, to answer the following questions: Will you attend on-site lessons in line and/or couples' C-W dancing? If so, then do you have a preference regarding instructors? Will you volunteer to organize the class or other club activities? Please respond by September 20.

Bowling

Red & Green League

R. Mulderig 231/202/201/634 scratch series, R. Eggert 267/610 scratch, K. Asselta 225, J. Griffin 221, H. Arnesen 221, R. Wiseman 215, R. Raynis 214, W. Powell 212, K. Koebel 212, F. Wahlert 211, G. Weresnick 210, G. Mack 204/203, D. Fisher 203, E. Meier 202, J. Cuccia, Sr. 202.

Purple & White League

S. DiMaiuta 251, N. Bessemer 232, K. Botts 226, P. Callegari 220/209, R. Picinich 219/181, M. Meier 212/197, S. Frei 212/188, P. Manzella 202/188, A. Pinelli 200, A. Wynkoop 194, A. Almasy 190, M. Guacci 190, R. Flack 190, P. Wynkoop 187, G. Mehl 186/185, M. Addressi 185, D. Riley 185, P. Baker 182, T. Mehl 176.

Service Awards

The following employees celebrated their service anniversaries during August:

	35 Years
Allen N. Goland.....	Applied Science
Louis P. Remsberg.....	Chemistry
	30 Years
Roland J. Baillargeon.....	Admin. Support
Leigh D. Hawkins.....	Physics
Richard S. Horwitz.....	CCD
Robert D. Jansson.....	Financial Services
Muriel I. Pfeiffer.....	Human Resources
	25 Years
James T. Garrison.....	NSLS
	20 Years
James A. Hanson.....	Plant Engineering
William E. Lenz.....	Physics
William T. Pratt.....	Adv. Technology
Pavel Rehak.....	Instrumentation
Donna E. Vestal.....	Reactor
Judith G. Williams.....	Applied Science
	10 Years
Norman Besemer.....	Plant Engineering
Peter R. Cameron.....	RHIC
John E. Carlson.....	AGS
James S. Frank.....	Physics
Joseph B. Mac Kenna.....	Reactor
Antonio B. McGill.....	Plant Engineering
James W. Wright.....	Plant Engineering

Adoption Assistance Available

Since October 1995, BNL has been providing financial assistance for the adoption of a child to regular employees who work 20 or more hours a week and have completed at least one year of continuous service.

The Lab repays up to \$3,000 in expenses for each child adopted; those children must be under 18 and not a relative or stepchild. Reimbursable expenses for adoption are: licensed adoption-agency fees, including those for placement and parental counseling; legal costs, including attorney's fees and court costs; and transportation costs to obtain physical custody of the adopted child.

Eligible employees who wish to benefit from this policy must notify the Human Resources Division in writing within 30 days of the start of the adoption. For more information, call Denise DiMeglio, Ext. 2881.

Quit Smart

Attention smokers wanting to kick the habit: Registration is now being accepted for the five-session "Quit Smart" smoking-cessation program, offered by the Health Promotion Program of the Occupational Medicine Clinic.

This behavioral approach to stopping smoking includes: auto-hypnosis

using audiotapes, nicotine fading by switching to progressively lower nicotine cigarettes, withdrawal management, and relapse prevention and recovery strategies. Information on the nicotine skin patch will also be discussed.

Quit Smart begins on Tuesday, September 24, and continues on October 1, 8, 11 and 21. All sessions will be held from noon to 1 p.m. in conference room A, Medical Department, Bldg. 490.

The fee is \$10, but it is waived for former participants in any BNL smoking-cessation programs. For more information or to register, call Mary Wood, Ext. 5923.

Computing Corner

The Computing & Communications Division (CCD) is offering the following:

Free Intro to PERL Programming

An introduction to PERL programming will be given free to registered participants on Monday through Thursday, September 16-19, from 5 to 8 p.m. in the CCD second-floor seminar room, Bldg. 515. The instructor will be Dave Kelly of Charter Oaks Inc. To register, call Ed McFadden, Ext. 4188 or e-mail emc@bnl.gov, or Pam Mansfield, Ext. 7286 or e-mail pam1@bnl.gov.

MIX Meeting Next Wednesday

All are welcome to attend the next Monthly Information eXchange (MIX) meeting with CCD, which will be held in Room B, Berkner Hall, at 11 a.m. on Wednesday, September 18. BNL's network architecture '96 will be discussed, and dialing into the Lab with Windows 95 will be demonstrated.



In Addition

In the August 30, 1996, edition of the Brookhaven Bulletin, the name of Steve Musolino, Relativistic Heavy Ion Collider Project, was inadvertently omitted from the list of volunteers who explained radiation to the general public in the Science Museum this summer.



E

Have you gotten your new Laboratory ID card yet? If not, time is running out, and your old card will soon expire.

All employees and contractors should visit Berkner Hall Room D any day this month between 9 a.m. and 4:30 p.m. to get a new card. Bring your old ID and a completed ID Card Application Form. For more information, call Hank Raimondo, Ext. 7258.

Don't Fall Out of Shape!

Summer's over, but you can stay in swimsuit shape all year by joining the BNL Aerobic Dance/Stretch Club. Come to aerobics classes on Tuesdays and Thursdays at 5:15 in the Recreation Building, or stretch classes at the same time and place on Wednesdays.

Pay in advance, at \$35 for any 10 classes, or pay by the class at \$4 each time. Call Pat Flood, Ext. 7886, or Kara Villamil, Ext. 5658, or e-mail karav@bnl.gov, to learn more.

Arrivals & Departures

Arrivals

Masahito Yoshii.....AGS

Departures

None

BROOKHAVEN BULLETIN

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

ANITA COHEN, Editor
MARSHA BELFORD, Assistant Editor

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.



Watch Hill Camp Out

The BERA Mountain & Canoe Club will camp at the group campsite at Watch Hill on Fire Island, from Friday through Sunday, September 20-22. Members new and old are invited to join the fun. For more information, call Nancy Kuehner, 878-6947.

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.

DD 3636. SECRETARIAL POSITION - Requires an AAS in secretarial science or equivalent, excellent secretarial and communication skills, comprehensive knowledge of Laboratory and office procedures, proficiency in WP WIN 6.1 and the ability to work within tight time schedules on parallel projects. Familiarity with tables and equations is necessary; a working knowledge of a spreadsheet program such as EXCEL is desirable. Will prepare complex scientific/technical reports, and perform secretarial and office-management tasks, including travel arrangements and vouchers, filing, etc., for the Risk and Reliability Group of the Engineering Technology Division. (reposting) Department of Advanced Technology.

DD 3218. SECRETARIAL POSITION - (term appointment) Requires an AAS in secretarial science or equivalent experience, excellent organization, communication and PC skills. Familiarity with WordPerfect, spreadsheets, graphics software, IPAP and INFORM, and knowledge of Laboratory policies and procedures required. Responsibilities include preparing correspondence and reports, maintaining a structured file system, ordering departmental supplies and equipment, maintaining community relations database mailing lists and using presentation software. Office of Environmental Restoration.

DD 0471. TOOL AND INSTRUMENT MAKER - Works on various materials from prints, sketches or verbal instructions. Sets up and operates machine tools, and also performs benchwork, on jobs that require the application of individual ingenuity in solving problems of method or results required, where previous standards of operation have not been established. Performs layout, preparation, setup, measurement, assembly and installation. Makes own tools, performs maintenance incidental to operation of machines, and may specialize. Central Shops Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

DD 0487. EXPERIMENTAL MACHINISTS - (term appointments) Will work on various materials from prints, sketches, or verbal instructions. Will set up and operate machine tools, and also perform benchwork, on jobs where standards of operation may require unique application. Performs layout, preparation, measurement, setup, assembly and installation. Makes own tools, performs maintenance incidental to operation of machines, and may specialize. Central Shops Division.