BROOKHAVEN BULLETIN
Vol. 49 - No. 29 July 28, 1995
BROOKHAVEN NATIONAL LABORATORY

At 35, the AGS Just Keeps Going, and Going . . . .

This week marks 35 years of physics at BNL's Alternating Gradient Synchrotron (AGS). At that age, many particle accelerators would have long since retired. But new experiments have breathed fresh life into the AGS — a second wind it will enjoy long after this year's birthday candles have been blown out.

Historically, this half-mile ring has been used by physicists to accelerate protons to high energies. When the protons reach full energy, they are extracted from the accelerator ring, then sent speeding down a beam line into a fixed target. The consequent collisions produce other particles, most of which don't naturally exist on Earth. Physicists study the properties of these particles with various electronics-based detectors to verify — or refute — current theories about the existence and behavior of matter at the subatomic level.

Home to many of Brookhaven's most memorable scientific experiments, the AGS reached full strength for the first time on July 29, 1960. In the three and a half decades since then, physicists working at the AGS have made several major contributions to science — including three Nobel Prize-winning discoveries.

Try Turning Them Around!

But the AGS owes its existence to yet another discovery: an innovative principle of accelerator design called "strong focusing." Strong focusing, discovered at BNL in the summer of 1952, gave physicists all over the world the capability to build the next generation of particle accelerators — ten times more powerful than the preceding generation of accelerator machines.

By alternating the directions of the poles of the huge magnets used to bend particles around the accelerator ring, physicists found they could "strongly focus" a particle beam and thus accelerate particles to much higher energies — specifically, 33 billion electron volts (GeV), the design energy of the AGS.

Ernest Courant, one of the co-discoverers of strong focusing and now an AUI Distinguished Scientist emeritus, describes how the discovery was a serendipitous conjunction of people and events.

That summer, the Cosmotron, the Lab's first particle accelerator, was in the finishing stages of commissioning. At that point, according to Courant, it was running beautifully. But, Stan Livingston, leader of a special task force to consider ways to build a better Cosmotron, suggested to a team of visiting scientists from Europe that particles would be easier to get to from the inside of the Cosmotron if half the machine's magnetic poles were facing the opposite direction.

So Courant, along with fellow researcher Hartland Snyder, worked out the equations for the alternating gradient. Immediately, they realized that strong focusing would occur.

As it turned out, a researcher working in Greece, Nick Christofilos, had made an earlier, independent proposal for the existence of strong focusing. However, the world was unaware of his discovery, since his results had not been published.

A Big Splash

Courant, Livingston and Snyder, meanwhile, readily grasped the significance of their breakthrough. At 3 GeV, the pioneering Cosmotron was already the highest-energy accelerator in existence. But, with the technology used to build the Cosmotron, a larger machine would have required a prohibitive amount of magnet steel. With strong focusing, however, physicists could build a machine ten times as powerful — with only twice as much magnet steel.

July 29, 1960: Scientists watch from the control room as the AGS successfully accelerates a beam of protons to full design energy for the first time.

"We knew it was a major improvement, so we made a big splash," said Courant. "At that time, high-energy physics was moving along very quickly. If there were more energy available, more things could be explored."

Soon afterwards, Leland Haworth, who was then the Lab's Director, drafted a proposal for the AGS in a mere five-page letter to the Atomic Energy Commission. Within six weeks, the proposal was approved. In recognition of Haworth's being the guiding force behind the Lab's "big machines," the AGS complex was dedicated to him in 1987.

Courant says it wasn't as if the proposed $25-30 million budget for the AGS project was a small chunk of congressional cash: Budget constraints were just as critical then as they are now. But, at that time, major projects did not require as much planning, paperwork and regulatory compliance as they do today.

"Things were more modest, and could be set up more quickly," Courant said. "And procedures were just not as formal back then as they are now."

For All Intensities and Purposes

Since the first crop of AGS experiments was conducted in the early 1960s, the role of the AGS has changed dramatically. Though the AGS, like the Cosmotron, began life as the world's highest-energy accelerator, it now sits at the lower end of the energy spectrum of the world's accelerators — which, thanks to strong focusing,

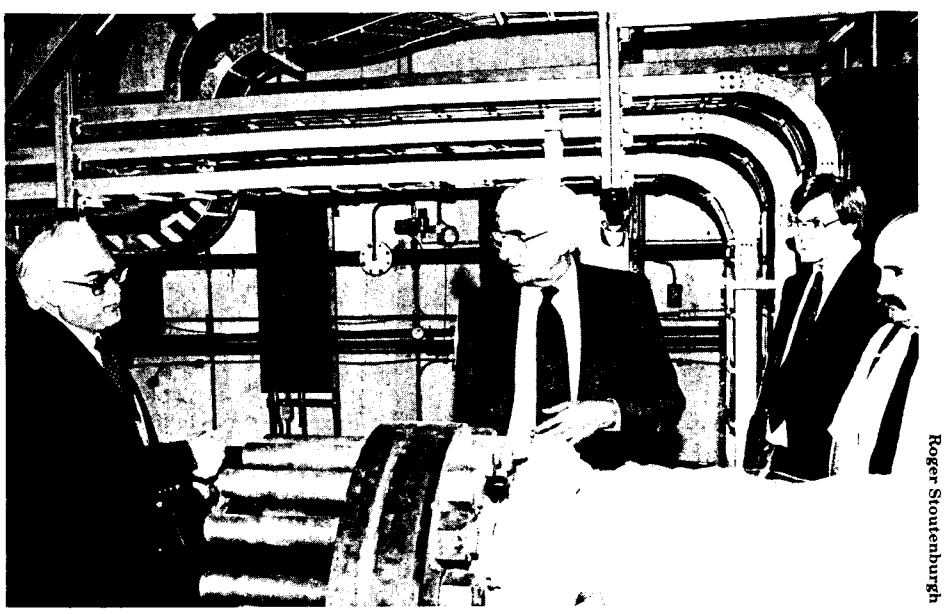
(continued on page 3)

DOE Inspector General Inspects BNL

Roger Stoutenburgh

To ensure honest and effective management, the Inspector General for the U.S. Department of Energy (DOE) is responsible for coordinating, supervising and managing audits, investigations and inspections of all department activities, including those at DOE's national laboratories. To meet the Board of Trustees and corporate officers of Associated Universities, Inc. (AUI), and to tour the site, DOE's Inspector General John Layton visited Brookhaven on April 13, along with DOE Assistant Inspector General for Investigations William Garvie and DOE Deputy Assistant Inspector General for Audit Operations Gregory Friedman. Stops on their tour included the Medical Department, the Relativistic Heavy Ion Collider and the National Synchrotron Light Source (NSLS), where John Layton (second from left in middle row) is pictured with: (same row, from left) William Thomlinson, NSLS Department Associate Chairman; Mark Sakitt, BNL Assistant Director for Planning & Policy; Carson Nealy, Manager of DOE's Brookhaven Area Office; (front, center) Denis McWhan, BNL Associate Director for Basic Energy Sciences; (back row, from left) William Garvie; Elaine Lowenstein, BNL Public Affairs Office; Franklin Federmann, AUI Chief Internal Auditor; (front, from left) Deborah Johnson, AUI Deputy Chief Internal Auditor; and Gregory Friedman.

New NRC Director Visits Lab



Roger Stoutenburgh

David Morrison (center), who became Director of the U.S. Nuclear Regulatory Commission (NRC) in May, visited the Lab on May 18 to become familiar with the research programs that BNL's Department of Advanced Technology (DAT) conducts for the NRC. One stop during his visit was the High Temperature Combustion Facility, where Morrison is shown with DAT's (left) John Boccio, (from right) Charles Finfrock and Trevor Pratt.

'Tennessee' Rowan Is Alive And Well, And Working in Supply & Materiel

"It was after lunch on Thursday, March 9: We had just had pizza in the lunchroom," explains Wenzel "Tennessee" Rowan, a then 58-year-old stores clerk in the Supply & Materiel Division who has worked at the Lab since 1968.

He stands up. "I walked into T-89, Receiving, and hung up my coat; and I went to get another purchase order," he says, punctuating his description by going through the motions. "I took two or three steps toward the table, and, bam," he slaps his hands together, "I went out."

"At 13:04, a woman working in Receiving called Ext. 2222 to report that one of her coworkers had passed out and was not coming to," says Fire Captain Russell Dunn of the Fire/Rescue Group, Safety & Environmental Protection Division. "Mike and I got there within a minute."

"When we found Tennessee, he was slumped in a chair — no pulse, no respiration, a complete cardiac arrest," recalls Deputy Fire Chief Michael Carroll. "Two of his coworkers were trying to resuscitate him, but to no avail. So, we laid him out flat, and I started manual CPR [cardiopulmonary resuscitation]."

At 13:08, Firefighters and Emergency Medical Technicians (EMT) Dan Harrow, Frank Palmeri and Bill Rabatin of the blue shift, and Tim Devine, who is usually of the red shift, arrived on the scene in the BNL ambulance with all their EMT equipment.

"When we got there, Tennessee was looking pretty gray and his eyes were rolled back in his head," recalls Rabatin. "We all knew him from around site, and it is different when you know the person. We didn't know whether he was going to make it or not, so we didn't think about it: We just did what we had to do."

"They bagged him," continues Dunn, meaning the EMTs used a resuscitation bag and mask to inflate Rowan's lungs, while Carroll continued manually compressing his chest. "But still nothing. So, while Tim set up the defibrillator, Mike asked for suction and Frank inserted an airway so oxygen could be administered."

"The defibrillator showed a flat line," which meant there were no electrical impulses in Rowan's stopped heart, remembers Palmeri. "We shocked him and still got nothing, so we set up the thumper," a mechanical device that untiringly compresses and releases the chest and, hence, the heart, thereby pumping the oxygenated blood throughout the body.

Wenzel "Tennessee" Rowan (center) and his Fire/Rescue Group rescuers: (from left) Deputy Fire Chief Michael Carroll, Firefighter Timothy Devine, Chief James Roesler, Fire Captain Russell Dunn, and Firefighters Frank Palmeri, William Rabatin and Daniel Harrow. For saving Rowan's life on March 9, the firefighters pictured were issued Certificates of Recognition from the Lab and the manufacturers of the defibrillator and thumper that they used.

— Photo by Roger Stoutenburgh

"We had gotten to Tennessee within the six minutes necessary to keep oxygenated blood flowing to his brain and prevent his immediate biological death, but, to prevent his clinical death, we knew we had to get him out of there and to the hospital," adds Rabatin. "So we did, and were we organized!"

"I was definitely very impressed with their teamwork, professionalism and efficiency," comments Fire Chief James Roesler, who arrived on the scene just after Rowan was defibrillated. The Chief also thanks the BNL Police Group, Safeguards & Security Division, for their at-the-scene assistance.

Rowan was placed on a long board and stretcher, and moved into the ambulance, which left for Brookhaven Memorial Hospital (BMH) at 13:13. In the ambulance, recalls Palmeri, "We hit Tennessee four more times with the defibrillator and got a light, erratic heartbeat, but no palpable pulse."

The ambulance arrived at 13:23, and "Six members of the hospital staff were waiting at the emergency-room door for the handoff," says Harrow. "They were putting in lines and injecting him as they were wheeling him down the hall." After Rowan was defibrillated three more times, all the immediate attention paid off.

"When we saw the heart rate and blood pressure on the monitor, it was so great, we were high," explains Palmeri.

"It was so fantastic to see a save," says Rabatin. "This made all the drilling we do worth it."

"We proved that, even when it looks very grim, it may not be too late," adds Harrow.

Having survived his heart attack, Rowan was admitted to BMH's cardiac intensive care unit. Four days later, while he was being transferred to the University Hospital at Stony Brook for further evaluation, he woke up to find his wife Iona and his daughter Teresa by his side.

Remembers Rowan, "My wife looked very worried and tired, I guessed because she was concerned that I had passed out. So I tried to reassure her, 'Tomorrow is Friday: The weekend is coming, so you'll be able to take it easy then.'

"She looked at me very alarmed and said, 'Honey, today is Tuesday.' So we looked at each other, and I knew something was very, very wrong. So I said, 'If today is Tuesday, then I lost four days of my life. What happened?' It was then that she told me that I had almost lost my life.

"I honestly had no idea, no recollection whatsoever of anything that had happened to me. So, when I was told all that I had gone through and had put my wife and family and friends through, it was a shock to me. That I woke up in my right mind after experiencing all that I did I knew was a miracle," declares Rowan.

Once at Stony Brook hospital, Rowan recalls, "I got ready to raise myself up in the bed, when I felt like a Mack truck had hit my chest because it was so sore. It was then I realized how hard everybody worked on me, and I was very thankful and so grateful because it was better than the alternative."

During his hospital stay, "I had people from the Lab who I didn't expect to care send me cards and call me. My wife didn't know that I knew so many people, and I didn't realize that I had so many friends. My Brookhaven Lab family prayed for me and cared more about me than I knew, and I would never have known it if I were dead."

After being stabilized on medication, having his diet revised and being told to exercise, which he now does by walking, Rowan was discharged on March 29. After convalescing at home, he returned to work on the 15th of May, but on light duty.

"I am through heaving and yanking," he states. "Besides, everyone is so protective of me: They tell me, 'Get away,' that they'll do it or give me a hand because, if I do this again, then they *will* kill me. I work with a good crew: Marco Donno, Izzi Garcia and Harriet Vanslyke, and I love them to death because, when push came to shove, they knew to call Ext. 2222 in an emergency."

Concludes Rowan, "The Fire/Rescue blue shift, God bless them, did a beautiful job and, if it weren't for them and the grace of God, then I would have been dead before they got me to the hospital. I thank them so much, and I can't thank them enough. From now on, blue is my favorite color."

— Marsha Belford

New Equation for Education

Under New York State's Compact for Learning Directive, school districts must review their school and community resources and develop an educational strategy to take full advantage of them. School districts must also work with the emerging Mathematics, Science and Technology (MST) Framework, which focuses on an integrated, cross-disciplinary instructional approach, with an emphasis on problem-solving.

To help local school districts meet these objectives, BNL's Science Education Center (SEC) launched its School District Technical Assistance Intiative this year. On May 9, BNL and the U.S. Department of Energy signed collaborative services agreements with six neighboring school districts: Longwood, Riverhead, Rocky Point, Shoreham-Wading River, South Country and William Floyd.

Under these agreements, BNL will continue to provide the school districts with such educational opportunities as the Elementary School Science Fair, Discovery Tours and research clubs. Reciprocally, the school district will help Brookhaven recruit students and faculty for the Lab's educational programs, such as the Community Summer Science Program and the Teacher Research Associates Program.

This sharing of cooperative resources among BNL and participating districts — and within each district — is integral to the new initiative.

Shown after signing collaborative services agreements under the Lab's new School District Technical Assistance Initiative are: (back, from left) Tom Staats, Rocky Point; Jean Lapinski, Riverhead; Robert Holmes, Riverhead; Wayne Mammina, Rocky Point; Sharon Clifford, Rocky Point; Phyllis Palma, William Floyd; Claire Goad, South Country; Mary Jo Farrell, South Country; Mark Sakitt, BNL Assistant Director for Planning & Policy; Candee Swenson, Longwood; Edward Fale, Longwood; Carson Nealy, U.S. Department of Energy's Brookhaven Area Office; (front, from left) Janet Tempel, BNL Public Affairs Office; Dennis Fidotta, William Floyd; Nina Leonhardt, BNL's Office of Educational Programs (OEP); Debbie Lohman, Shoreham-Wading River; and Karl Swyler, OEP.

— Photo by Roger Stoutenburgh

Women's Program Review at BNL

The 1996 DOE Review of Laboratory Programs for Women will be held at BNL May 6-8, 1996, and over 100 DOE employees and DOE contractors are expected to attend. So, volunteers are needed to help plan and organize this review.

All who would like to help are invited to attend an organizational meeting on Wednesday, August 2, at noon in Berkner Hall, Room C. If you are unable to attend the meeting, but would like to volunteer, call the Lab's Women's Program Coordinator Vicki McLane, Ext. 5099.

AGS Turns 35 (cont'd)

have reached energies as high as 1.8 trillion electron volts thus far.

Now, however, the AGS is valued as a low-energy, high-*intensity* machine. Earlier this year, the AGS broke its own world's record for proton intensity, with 63.3 trillion protons per pulse - 6,300 times greater than its original design intensity. That means that, though the AGS still operates at its original design energy, it is able to accelerate and collide particles in far greater *numbers* than any other synchrotron accelerator.

According to AGS Department Chairman Derek Lowenstein, a high-intensity machine allows researchers to probe extremely rare processes at low energies — for hints that heavier particles and new physics exist at higher energies.

"When you're looking for one part in a trillion," explains Lowenstein, "you have to collect a lot of data before you can see one event. In other words, you need either a lot of beam or a lot of time."

Purely a proton accelerator for its first twenty-three years, the AGS has grown accustomed to wearing more than one hat. In 1983, the machine was upgraded to accelerate polarized protons — protons that all spin in the same direction. And, in 1992, the AGS began accelerating heavy ions, a feat made possible by building a transfer line from the Tandem Van de Graaff accelerator and then building the Booster between the Tandem and the AGS.

What's more, even as it enters the prime of life, the AGS is being readied for use as an injector for the Relativistic Heavy Ion Collider (RHIC), scheduled to be completed in 1999. Like low gear in an automobile transmission, the AGS will accelerate heavy ions such as gold to an intermediate energy — 12 GeV per nucleon — before they are kicked into high gear — 100 GeV per nucleon — in the 2.5-mile RHIC accelerator ring.

George Washington's Ax

During its 35-year lifetime, the AGS has undergone so many improvements and upgrades that little is left of the original machine. According to Lowenstein, the only two parts of the 1960 machine still in use are the actual stand the magnets are mounted on and the steel the magnets are made of.

"It's like when you go to Mount Vernon, and the tour guide shows you George Washington's ax," says Lowenstein. "It may have had seven new blades and three new handles since then, but it's still George Washington's ax." — Brad Keoun

Arrivals & Departures

Arrivals

David E. Johnson.....Chemistry
John Wilson.....Cent. Shops

Departures

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

Cynthia M. Morgan.....Plant Eng.
Eva M. Schwarting.....App. Science
Theodor Teichmann.....Adv. Tech.

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

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

In Case of Emergency . . .

Roger Stoutenburgh

In the case of a major BNL emergency that might affect personnel health and safety, Lab employees would be instructed to evacuate the premises immediately. But someone has to stay behind to respond to the emergency. So, where would they stay? To address this question, a new Emergency Operations Facility (EOF) was established in May. Enclosed in concrete walls inside an earthen berm, the new EOF — located in Bldg. 754 — contains a library of emergency-information materials, such as maps, floor plans of buildings and overall emergency procedures. It also has a complete communications system, with two-way radios, several direct telephone lines, and a satellite link to cable news and weather channels. What's more, the facility features a backup power supply, filtered ventilation system, locker room, shower, bathroom and kitchen, so it can easily support a staff of emergency management personnel for several days. In the event of an emergency, the EOF would be staffed by representatives from the Director's Office, Safety & Environmental Protection (SEP) Division, U.S. Department of Energy's Brookhaven Area Office, Public Affairs Office, and the Safeguards & Security Division. Outside agencies, such as the Suffolk County Police Department and the Federal Bureau of Investigation, could also be called upon to assist an emergency response. Simulating emergency response procedures in the Crisis Management Room are: (front, from left) Ray Weber, Alan Kuehner, and Ken Krasner, all of SEP; M. Sue Davis, Associate Director for Reactor, Safety & Security; and (through the window) in the Technical Support Room, Steven Moss, also of SEP.

Hands-On Approach to Small Business

Roger Stoutenburgh

As part of the National Aeronautics and Space Administration (NASA) TAP-IN Project, BNL's Office of Technology Transfer (OTT) teamed with NASA to host a day-long seminar titled, "How to Start Your Own Technology-Oriented Business — a Hands-On Approach." Held May 24 at Hofstra University and May 25 at Brookhaven, the seminar attracted metropolitan and local entrepreneurs, small businesspeople and patentees looking to get their businesses off the ground. Speakers instructed seminar participants in ways to attract investors; procure technology from the U.S. Department of Energy, NASA and other federal laboratories; and assess their ideas' commercial viability. In a panel discussion, successful entrepreneurs told participants how to avoid pitfalls commonly experienced by small business owners. At Brookhaven, participants enjoyed a lunchtime tour of the National Synchrotron Light Source. Speakers and organizers at the conference were: (back, from right) Richard Ash, Center for Technology Commercialization (CTC), NASA; Linda Krull, CTC; Joseph Looney, KPMG Peat Marwick; Konstantinos Lahanas, Estee Lauder; Aliza Sherman, CG Internet Media; (front, from right) Joseph Heyman, NASA Langley Research Center; Dorry Tooker, OTT; Steven Dondero, Venture Capital Fund of America; Barry Carus, Rivkin, Radler & Kremer; and Arlene Wolochuk, OTT.

REVEAL Training

Since the price of paper has nearly doubled, the Management Information Systems (MIS) Division has been asked, as a cost-cutting measure, to stop its general distribution of computer printouts of its administrative data.

The conversion from paper printouts to electronic access will be ongoing, with the goal of reducing the number of printed reports by 80 percent by October 1, 1996.

As a result, beginning October 1, users of MIS management information may begin to access it electronically, using software called REVEAL.

Running on the HP3000 computers in MIS, REVEAL 3000 allows users to view reports using any personal computer or terminal on the system, by scrolling, searching or going window by window through a report.

Then, companion software called PC REVEAL allows a report to be downloaded to a user's hard disk or floppy disk, so that the information may be reviewed on the screen, or printed in its entirety or in portions as needed.

So users may become proficient in using REVEAL software to access MIS data, REVEAL training will be provided on: August 2, 3, 4, 21 and 23. To schedule training, call Michelle Cummings, Ext. 2077, or Joan Barrow, Ext. 3290.

Softball

Standings as of July 21

League E1		League E2	
Blue Jays	10-1	Big Sticks	8-1
Phoubars	8-3	Lights Out	7-2
System	7-4	Contaminators	6-3
Jerky Boys	7-4	Hammerheads	6-3
Titans	5-6	Hy Tech	6-3
Six Pax	5-6	Phase Out	5-4
Up & Atom	2-9	Scram	5-4
CCD	0-11	Sure Fire	5-4
League M2		Bombers	2-7
Skeleton Crew	4-1	Out of Control	2-7
No Names	4-2	Feds	1-8
What's on 2nd	3-2	Medical	1-8
OER-Wellheads	4-3		
Varmints	3-3	**League M1**	
Ground Hogs	2-5	Goodtimers	5-0
Stray Cats	1-3	StingRays	4-1
		Gour-Mets	6-3
		Parke Avenue	2-3
		Snake Bites	3-5
		Personnelities	2-4
		Strike Force	1-7

Scoring Notice
If winning teams do not submit score sheets to their League representatives, unreported scores will be recorded as losses for both teams.

Paddle Forge River

Tomorrow, the Mountain & Canoe Club will gather at 10 a.m at the Forge River for a canoe trip on the Great South Bay. The destination will depend upon the weather, but the return is expected by mid-afternoon.

All are invited; bring a picnic lunch. If you need more information or if you do not have a canoe, call Sheryl Carey, Ext. 7716 or 929-8741 evenings, or Alan Kuehner, 878-6847 evenings.

Cafeteria Menu

Monday, July 31	
Soup: Spicy potato & kale	.90/1.20
A la Carte: Pasta w/sausage	3.50
Lite: BBQ chicken	3.95
Deli: Baked ham & beans	3.20
Grill: Reuben	3.30
Tuesday, August 1	
Soup: Chicken noodle	.90/1.20
A la Carte: Roast chicken w/stuffing	3.95
Lite: Herbed pork loin	3.85
Deli: Corned beef & cabbage	3.20
Grill: French dip	3.30
Wednesday, August 2	
Soup: Broccoli & cheese	.90/1.20
Display Cooking: Chicken Caesar	4.75
Deli: Roast turkey w/stuffing	3.20
Grill: Tuna melt	3.30
Thursday, August 3	
Soup: Beef vegetable	.90/1.20
A la Carte: Baked lasagna w/foccacia	3.65
Lite: Grilled steak	3.95
Deli: Roast beef w/mashed potatoes	3.20
Grill: Spanish omelette	3.30
Friday, August 4	
Soup: New England clam chowder	.90/1.20
A la Carte: Grilled liver w/potatoes	3.85
Lite: Italian fish roll-ups	3.95
Deli: Pastrami Dijonnaise	3.20
Grill: Meatball hero	3.30

Service Awards

The following employees celebrate their BNL service anniversaries during the month of July:

40 Years

Joseph H. Jones.....Info. Serv. Div.

35 Years

Arnold L. Aronson.....Adv. Tech.
Frank R. Norton.....Staff Serv.
Anastasios Soukas.....AGS
Frank C. Strelecki.....Plant Eng.

30 Years

Patrick J. Asendorf.....Biology
Robin R. Gianopoulos.....Reactor

25 Years

Irma I. Montanez.....Human Res.

20 Years

Michael A. Bender.....Medical
Alan M. Bieber Jr......Adv. Tech.
Robert M. Doty.....Adv. Tech.
Asher Etkin.....RHIC
Thomas E. Imperial.....Cent. Shops
Upendra S. Rohatgi.....Adv. Tech.
Prantika Som.....Medical
Alvin J. Vestal Jr......Sup. & Mat'l.
Peter J. Wanderer Jr......RHIC

10 Years

Tracy R. Blydenburgh.....Reactor
Eva M. Esposito.....Sup. & Mat'l.
Isidro P. Garcia.....Sup. & Mat'l.
James Gibbs.....Plant Eng.
Terry A. Jones.....Info. Serv. Div.
Christopher S. Jung.....Plant Eng.
Walter Milouski.....Cent. Shops
Leonard M. Pharr.....NSLS
Horst Ratzke.....Physics
D. Peter Siddons.....NSLS
Michiko Tanaka.....Info. Serv. Div.
Roger P. Taneus.....Reactor
Gary P. Utz.....Mgmt. Info. Sys.
Lawrence Vogt.....AGS

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position. Consideration is given to candidates in the following order: (1) present employees within the department/division and/or appropriate bargaining unit, with preference for those within the immediate work group; (2) present employees within the Laboratory; and (3) outside applicants. In keeping with the Affirmative Action plan, selections are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

Each week, the Human Resources Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Human Resources, and second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (282-7744), for a complete listing of all openings.

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

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

SCIENTIST - Trained in natural sciences or computer science, with extensive experience in building and managing biological databases, to head the database-development group of the Protein Data Bank (PDB). Will be responsible for the design, development and maintenance of database systems for the overall management and public distribution of the PDB archives. Contact: Joel Sussman, Biology Department.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

MK 3938. ADMINISTRATIVE POSITION - Requires a bachelor's degree or equivalent experience, substantial administrative experience, excellent oral and written communication skills, and knowledge of Laboratory policies and procedures, specifically scientific staff personnel policies/practices. In addition, knowledge of PC-based software, such as WordPerfect and IPAP, and an understanding of a broad spectrum of technical disciplines are also required. Will be responsible for various aspects of the hiring of scientific staff, providing continued assistance in the interpretation of policies and procedures, and administrating various programs in the Office of Scientific Personnel. Human Resources Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

DD 3916. TECHNICAL POSITION - Requires a BS in mechanical technology or equivalent experience. Experience with industrial arts and machine-shop practices including brazing required; vacuum, laser optics and survey-techniques experience desired. Familiarity with the operation of electron accelerators also desirable. National Synchrotron Light Source Department.

LS 3918. ENGINEERING POSITION - Requires an MSEE, with emphasis on feedback-control theory or equivalent. Experience with DSP utilization in control circuits is desirable. Responsibilities include working with large, highly regulated power supplies. National Synchrotron Light Source Department.

Motor Vehicles & Supplies

92 EXPLORER XLT - 4-dr., 4wd, a/t, ac, p/w, p/d, new tires, 3-yr. warr. remaining, 50k mi., excel. cond., $15,500 neg. Ronnie, Ext. 7132.

91 BUICK LE SABRE CUSTOM - 40k mi., orig. owner, full power, excel. cond., $9,950. Pete, Ext. 4235 or 462-9839.

89 KAWASAKI NINJA - 600cc, water-cooled, $2,900; '81 Mustang T-top, $1,200; '87 Monte Carlo, 20k mi., rebuilt eng., p/w, p/s, new shocks, $3,850. 277-2459.

89 FORD ESCORT- dark blue, ac, am/fm cass., 86k mi., good cond., $3,000 red. Ext. 2604.

88 PONTIAC FIREBIRD FORMULA - 5 liter V-8, a/t, ac, T-top, 41k mi., $6,500. George, Ext. 4590.

88 HYUNDAI EXCEL - 5-spd. h/b, red, p/s, p/b, 80k mi., $1,200. Dan, Ext. 3558.

88 TOYOTA COROLLA - 5-spd., ac, radio, 89k mi., v.g. cond., $4,200. Joel, Ext. 5038.

87 CUTLASS CIERA - 4-dr., ac, am/fm tape, p/s, p/b, 91k mi., excel. cond., $2,000. Ext. 3499.

87 MERCURY SABLE GS - 4-dr. sedan, a/t, 6-cyl., ac, am/fm, white, blue int., 86k mi., $3,100. Takeshi, Ext. 5323 after 5 p.m.

87 OLDS CIERA - 4-dr., ac, am/fm cass., p/s, p/b, 91k mi., excel. cond., quick sale, $2,000. Ext. 3499.

87 FORD TAURUS - a/t, ac, cruise, am/fm cass., p/mirror, clean, 97k mi., good cond., $2,200 neg. Gary, Ext. 3625/1273.

86 AUDI QUATTRO - 5-spd., p/s, p/b, ac, sunroof, $3,800. Ext. 3338 or 286-3863 eves.

86 HONDA CIVIC - h/b, 5-spd., am/fm cass., sunroof, red, extras. Kevin, Ext. 2963 or 744-0871.

86 TRANS AM - 70k mi., fully loaded, T-top, 5-spd., 305, $4,500 neg.; '79 Titan motor home, 25', fully equip., sleeps 6, $5,900. John, 348-7666 or 286-1505.

86 OLDS DELTA 88 - V-6, all power, 86k mi., runs well, some body damage, $2,500 neg. Ext. 2683 or 751-2469.

86 MAZDA 626 - 4-dr., a/t, ac, 103k mi., v.g. cond., $2,000. Marvin, Ext. 7155.

86 OLDS CUTLASS SUPREME - black, T-top, rebuilt eng., many new parts, $2,000 neg. Andy, 447-5965 after 6 p.m.

86 NISSAN PICKUP - 96k mi., 5-spd., new tires, muffler & brakes, $1,500. George, Ext. 5288 or 878-8177.

85 RENAULT - m/t, runs well, needs work, good for parts, asking $500. Robyn, Ext. 2680.

84 CADILLAC ELDORADO - clean, runs well, $1,700 neg. 924-4688.

83 PONTIAC FIREBIRD SE - V-6, black, just inspected, many new parts, $450 neg. Ext. 4242.

83 CAMARO - 4-spd., sunroof, rebuilt eng., new struts, clutch, windshield, rad., exhaust system, radio, asking $1,750. 325-0563.

83 HONDA ACCORD - 5-spd. h/b, 130k mi., new clutch, battery, muffler, runs well, looks OK, $900. Austin, Ext. 5329 or 363-2796.

82 FORD GRANADA WAGON - a/t, p/s, am/fm, runs well, good cond., $800. 427-2435.

74 FORD E-300 - set up for locksmithing, will sell with or w/o equipment, make offer. Pete, Ext. 5105 or 399-2813 after 5 p.m.

OLDS - 455 Rocket, 400 turbo tranny, excel. running cond., $500. Joe, Ext. 2214.

CAP - for Chevy S10, good cond., best offer. Jesus, Ext. 4879 or 286-5403.

AIR FILTERS - Lee/Sears brand, AFL-52, $10/4. Susan, Ext. 7647.

ROLL BAR - w/4 lights, alum., made for pickup trucks, fits lightweight pickup, orig. $350, asking $175. David, 289-2925.

94 SATURN SL2 - blue/black, a/t, ac, p/l, p/w, abs, traction control, leather int., sunroof, CD stereo, 22.5k mi., $13,950. Rich, Ext. 5886 or 751-7218.

94 FIREBIRD - 15k mi., black, V-6, a/t, abs, dual airbags, 8-speaker stereo, alloy wheels, loaded, mint, $13,990. Dave, Ext. 7277.

92 PROWLER CAMPING TRAILER - 24', loaded, sleeps 6, awning, m/w, cac, l/r, kit., bath, in/out shower, must sell, $8,500. Bill, Ext. 2762 or 665-3782.

91 MAZDA NAVAJO 4x4 - loaded, cruise, 7/70k, sunroof, a/t, triK ed., excel. cond., $11,200. 821-8347.

89 HONDA CRX - 5-spd., silver, ac, 45 mpg, excel., $4,800. John, Ext. 7671 or 765-1299.

89 FORD ESCORT LX - h/b, red, 5-spd., am/fm cass., 89k mi., excel. cond., $2,700. Bob, 821-0695.

89 CHEVY CORSICA - 4-dr., 4-cyl., ac, a/t, cruise, tilt, high mi., excel. cond., $2,800. Carlos, Ext. 2614 or 341-1087.

89 FORD ESCORT- dark blue, ac, am/fm cass., 86k mi., good cond., $3,000. Ext. 2604.

89 BUICK LESABRE - 78k mi., 6-cyl., p/s, p/b, ac, maroon, 4-dr., am/fm cass., excel., $4,000. Ext. 7960.

87 BRONCO 4x4 - 4.9L, 6-cyl., full-size, 72k mi., $5,700. Frank, Ext. 4220 or Vita, 277-0464.

87 FORD TEMPO - 4wd, 4-dr. sedan, new tires & carb., well maint., 86k mi., asking $3,500. Ext. 2683 or 751-2469.

87 COUGAR LSC - full power, sunroof, 3.8L V-6, ac, 52k mi., excel. cond., $4,500 neg. Rich, Ext. 4157 or 473-6327.

86 BUICK CENTURY - high mi., one owner, reliable mech., good station car, asking $1,500. 929-4716.

86 CAMARO - V-8, blue, T-top ac, am/fm cass., runs well, pass. door damage, $2,000. Dave, Ext. 3199.

86 PONTIAC GRAND AM - 6-cyl., a/t, cruise, ac, p/seat, 4-dr., orig. owner, gar., 90k mi., central lock, v.g. cond., $3,200. Ext. 3701 or 751-8128 eves.

85 TRANS AM - conv., white w/black top, only 500 made, full power, 5-spd., 350 cu. in. TPI, $8,000. Frank, Ext. 4220 or beeper 279-3539.

85 FORD RANGER 4x4 - cap, rebuilt trans., eng. done by A#1, 2.8L, new tires, everything works well, $2,500. Pete, Ext. 5105 or 399-2813.

85 MAZDA 626 LX - 89k mi., 4-dr., white, must sell, asking $1,200. Ext. 2238.

85 BUICK REGAL LTD. - V-6, p/w, p/l, white/burgundy velour int., good cond., runs well, $1,500. Phil, 924-8859.

84 CAVALIER - 2-dr. h/b, type 10, 96k mi., p/s, p/b, ac, sunroof, cass., new tires, brakes, shocks, exhaust, $1,250. Richie, Ext. 2216 or 734-7342.

84 CADILLAC ELDORADO - clean, runs well, low mi. 727-7741, leave message.

84 NISSAN SENTRA - 2-dr. h/b, 5-spd., am/fm cass., 86k mi. runs well, best offer. Fong, Ext. 3421.

83 DODGE PASSENGER VAN - just reconditioned by Dodge, full-size, windows, ac, cruise, stereo, excel., $4,200. Mike, Ext. 3430.

82 YAMAHA 920 VIRAGO - 9k mi., new clutch, battery, master cylinder, asking $1,250. Henry, Ext. 5725 or 727-7227.

80 CHEVY MONTE CARLO - 83k mi., V-6, p/s, p/b, ac, runs well, ask. $1,000. Billy, Ext. 5046.

74 HONDA CB175 - 24,850k mi., gar., excel. cond., $575. Herbert Hildebrand, Ext. 3172 or 929-4446.

71 VW SUPER BEETLE - conv., needs restoration, good body & glass, engines need rebuilding. Rich, 929-8514.

69 BUICK SKYLARK - 4-dr., hardtop, 350 V-8, a/t, p/s, p/b, runs well, asking $650. Joe, Ext. 3893.

PARTS - '84-'86 S10 Blazer; '86 Camaro. Rob, Ext. 7668.

PARTS - '84-'86 Mustang, rear hatch w/glass, $45; pass. side door, $25; 4 LX rims, 14", 4-bolt, $30; push bar, Nissan pickup, $15. Joe, Ext. 5340.

TIRES - 2, Eagle GT+4 (89H), P205/R55/16, $25 ea. Ext. 5873.

RIMS - 5, fits Chevy, 15", 6-lug, white, $50 neg. Kathy, 821-2586.

CAMPING TRAILER - 14", all fg, lightweight, stove, sink, dinette, needs minor work, easy to tow, $350. Lou, Ext. 4289.

Boats & Marine Supplies

50' CT41 TA CHIAO - 1981 ketch, Perkins 4.154 diesel, 62-h.p., fg hull w/teak int. & decks, 7 sails, $89,000. 928-1020.

19' CRUISER - fg, 115-h.p. Johnson, galv. trailer, p/winch, $2,100. Jim, Ext. 3372 or 821-0250.

19' CITATION - 1987, cuddy cabin, w/Shorland'r trailer, 165-h.p. i/o Merc., very low mi., excel. cond., $9,500 or best offer. Pete, Ext. 4235 or 462-9839.

18' PRECISION SAILBOAT - 1987, cabin, 4-h.p. o.b., 3 sails, Escort trailer, Coast Guard pkg. Mike, Ext. 4789.

TROLLING MOTOR - Sears Die-Hard, 12V, 15 lb. thrust, like new, w/battery, $85. Ext. 2769.

28' CARVER - 1990 Mariner, twin 305 Crusaders FWC, FB, swim platform w/hot & cold shower, sleeps 8, many extras, mint cond., $47,900. John, Ext. 7039.

14½' CAPRI DAYSAILER - 3-yr.-old trailer, many extras, excel. cond., $2,250. Dave, Ext. 7277.

TRAILER - 1990, Magic Tilt, like new, seldom used, galv. steel, extends up to 16', 600-lb. capacity, $200 firm. Delis, 758-9235.

KAYAK - Wilderness Systems Arctic Hawk, Kevlar, used 1 season, hatches, ABS seat, footbraces, fg paddle, Yakima saddles, $1,950. Carlee, Ext. 3125.

BIMINI - framework, ⅞" o.d., anodized alum. tubing, 80" width, 3-bows, $20. Gary, Ext. 3751.

Furnishings & Appliances

AIR CONDITIONER - old but works well, $25; boy's bike, 18", $20. Craig, Ext. 2752 or 751-6571.

AIR CONDITIONER - G.E., 12,000 Btu, good cond., $225. Don, 298-4138.

BABY CRIB - Simmons, light oak, excel. cond., $75. Diane, 924-4879.

BLINDS - Levelor-style, fits 6'x5' window, $10. Chris, Ext. 2593.

BUNK BEDS - heavy-duty, v.g. cond., less than 2 yrs. old, orig. $369, now $200. O. Booker, Ext. 3082 or 727-5912.

CARPETING - Karastan remnant, new, blue, approx. 2 yds, suitable for stairs, hallway, mats, nylon, orig. $45 sq. yd., asking $30. Herb Hildebrand, Ext. 3172.

CHAIRS & TABLE - 6 ladder-back chairs & dining room table, $150; freezer, United, heavy-duty, 16 cu. ft., $300. Dave, Ext. 5460.

COUCH - Hide-A-Bed, sturdy, 11 yrs. old., new slip cover incl., $200. Ext. 2165 or 929-6610.

DESK - metal, office, large, 7 drawers, black, $25. Phil, 924-6790.

DINING ROOM - French Provincial, $850; living room, $450; kitchen table w/6 chairs, $75; baby's crib & dresser, $50. Bob or Celeste, 467-9171.

DISHWASHER - Hot Point, Potscrubber, full controls, w/black reversible panels, good cond., $120. Frank, Ext. 4220 or Vita, 277-0464.

ENTERTAINMENT CENTER - room divider, oak finish, 49½"w x 67"h x 15½"d, $50. Joe, Ext. 2898.

FAN - ceiling, 52", HD, commerical, 2-spd., 7,000 CFM, Emerson electric, $15. Albert, 727-4884.

HEATER - electric baseboard, 500/1,000/1,500 watts, 110/240 V, thermostat, $15; humidifier, Toastmaster, 10-gal./day, 1 yr. old, $30. Albert, 727-4884.

LAMPS - 2, gray, living room table lamps w/white shades, like new, $20 ea. Steve, Ext. 2897.

TABLES - cocktail & 3 end, $50 ea.; Mediterranean lamps, $25 ea.; ginger jar lamps, $10 ea.; broiler, Farberware, elec., $7; pots, enamel, $10. Ext. 2457.

TABLES - oak, coffee & end, new, $200/both; vertical blinds, 7½' fits 6 ft. doors, valance, cream, woven material, $100. Margaret, Ext. 2529 or 588-7989 eves.

WASHER - Sears Kenmore, heavy-duty, large capacity, almond, 4 yrs. old, $200. Ron, 472-6578.

WASHER - Westinghouse, white, standard capacity, used for 3 yrs., like new, $140, must sell, moving. 928-3452.

Tools, House & Garden

ELECTRIC HEAT BASEBOARDS - various lengths, all excel. cond., make offer. Joe, Ext. 5340.

ENGINE - Tecumseh, 8-h.p., new horizontal shaft, easy start, $200. Don, 298-4138.

GARDEN HOUSE - screened, 10' round, port., canvas top, used 4 yrs., $110; jet pump & motor, 1-h.p., 230/115V, used 1½ yrs., $125. John, 924-4193.

HEAT PUMP - Trane # BPCB-302C-A, indoor unit of split system, 5.6 A, ½-h.p. Harvey, 281-7568.

HEATING UNIT - Miller Gun, v.g. cond., $50. O. Booker, Ext. 3082 or 727-5912.

LAWN MOWERS - 2, Snapper 21", rear bag w/ Snapperizer, $75; Rally, 22", $75. Bart, Ext. 2005 or 924-6761.

LAWN MOWERS - 2, 21" rotaries, $65 ea; rear bag, 22", $75; riding lawn mower, Snapper, 11-h.p., 33" deck, $600. Dan, Ext. 4220 or 698-7322.

LAWN MOWER - Craftsman, 20", side throw, $40; Craftsman, 20", rear bag w/2 bags, $50; Snapper, 20", rear bag, $85. Joe, Ext. 5340.

LAWN SPRINKLER SUPPLIES - parts, timers, relays, 220V, 110V, 24V, etc., new. Bob, 289-2986.

PUMP - Goulds shallow-well, ½-h.p. motor w/40-gal. tank, good running cond. Barbara, 281-5721.

RIDING LAWN MOWER - 30" cut, 8-h.p. B/S, engine runs, needs work, $125. Walter, Ext. 7168.

RIDING LAWN MOWER - Snapper, 8-h.p., $150. Mike, Ext. 4293.

Sports, Hobbies & Pets

BICYCLE - woman's Ross Lightweight 10-spd., 27" wheel, 19" frame, racing-style handlebars, red, excel. cond., $45. Linda, Ext. 2733 or 395-6784.

BIKE - woman's 12-spd., Shogun, Shimano gears, toggle latch tires, road bike, hardly used, $100. Jim, Ext. 5537.

BIKES - two 20" folding h.d. frame, mint, used once, $75 ea. Frank, Ext. 4220 or George, 669-6791.

CAMP STOVE - Coleman, 2-burner, steel case, baked enamel, green, copper fuel tank, folds like suitcase, $20, never used. Kathy, 821-2586.

DIRT BIKE BOOTS - AXO, used 3 times, size 10, $100. Joe, Ext. 5340.

EXERCISERS - gym, $250; rowing machine, $35. Bob or Celeste, 467-9171.

EXERCISER - Body by Jake, used 5 times, $80. Al, 331-1003.

HAM RADIO - two-meter portable, works, made by HyGain, $40. Joe Mead, Ext. 2148.

KAYAKS - 2 Perception Whitewater, med. cap, lg. cap., skirts, Flotation, $400 ea, both $700. Scott, Ext. 5319 or 929-4563.

METAL DETECTOR - White's Professional Series 3900D w/earphones, orig. $300, now $75. Gerry, 447-6528.

POODLE - pedigree black toy, sweet little girl, needs loving home. 689-1725.

SAILBOARD - O'Brien beginner's board, complete, ready to sail, $225. Al, Ext. 2575.

TENT - for three, very new, ask. $20; bird cage, ask. $5; soccer ball, ask. $4. Gang, Ext. 3625.

Audio, Video & Computers

COPIER - Xerox 5046, large office-type. Bob, 289-2986.

ELECTRONICS - Panasonic 27FSIIs TV, $520; Sony SLV-720HF VCR, $350; Sony CDP-C345 CD, $180; Panasonic KX-T4400 phone, $175. Rob, Ext. 5161.

PRINTER - for PC, works well, $10. Ext. 4719.

RECEIVER - Vector Research, am/fm stereo, 22.5 W/ch, 2 inputs, Vernier tuner, excel. cond., $25. Chris, Ext. 2593.

RECORDS - old 78s & 33s, will sell cheap to interested collector. Lois, 751-0023.

SOFTWARE - Microsoft Works V3.0, brand-new, shrink-wrapped, incl. software license, retails for $100, make offer. Paul, Ext. 4156.

TV - & VCR, Sharp 14", used few months, remote control, on screen, both w/warranty, $220 all. Carlos, Ext. 2614 or 341-1087.

TYPEWRITER - Canon, electric, like new, $50. 363-4279.

Miscellaneous

EQUIPMENT FOR HANDICAPPED - wheelchair, new upholstered commode & booster seat, transfer board, walker, more. Bill, 924-6940 after 7 p.m.

SUITCASE - hard-shell, $15; playpen, $10; exercise bike, $15; stroller, $15. Kathy, 744-2203, after 5 p.m.

TICKETS - Van Halen concert, Jones Beach, Tues., 8/22, 3 seats. Mike, Ext. 7941.

TICKETS - Santana & Jeff Beck, Jones Beach, 8/11, 8 p.m., 2 seats, $32/ea. 878-3691.

WEDDING GOWN - Jessica McClintock, brand-new, never worn, romantic Victorian style. 696-6979.

Free

COAL STOVE - Surdiac Gotha 511, needs heat exchanger (<$200), you take away. Bob, 821-3070.

CRIB - used, no mattress. Janet, Ext. 2345, 929-3910.

KITTENS - 5 adorable kittens need a good home, 6 wks. old. Ed, Ext. 2697.

SEWING MACHINE - 1945 Singer, portable w/all accessories, runs but frayed electric cord. 286-5716.

Car Pools

LIE EXIT 36 - fourth person needed for carpool. John, Ext. 5181.

Wanted

APARTMENT OR HOUSE - to rent, 2-3 bdrm., SWRSD, on/after 8/1. Don, Ext. 7237 or 744-2921 after 5:30.

BABY-SITTER/HOUSEKEEPER - for 4-5 days a week. Joshi, Ext. 3847 or 281-1077 eves.

CAR - 1970-72 Chevy Camaro. Bill, Ext. 4034.

CARS/PARTS - VW Beetle. Rich, 929-8514.

DRAWING TABLE - Anco-type, all wood, A-frame stand, 23"x31" size; rototiller, gas-powered, mini-size. John, Ext. 7671.

HOUSE TO SIT - free, experienced, caring, any period after 8/13. Jack, Ext. 2412.

OUTBOARD MOTOR - 2.5-3 h.p. short shaft for inflatable boat, reasonable price. Frank, Ext. 4220.

ROOMMATE - to share yet-to-be-found apt., female Lab employee pref., smoker. Jennifer, Ext. 7483.

TEACHER - nursery school, exp., M,T,Th morn. beg. Sept. for small co-op school. Jane, 929-8513.

VOLUNTEER - computer/electronics whiz to hel muscular dystrophy patient get his specially-equipped van back on the road. Janet, Ext. 2345 or 929-3910.

In Appreciation

Many thanks to all the good people at BNL: The last 15 years have been a blast, and I will miss you.

— Tony Ievolella

Classified Ad deadline is 4:30 p.m. Friday for publication Friday of the next week.