BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

BNL Completes Central Calorimeter for D0 Detector: Commissioning and Testing to Start This Fall

By the end of July, the 200-inch-in-diameter, donut-shaped cryostat containing the three-ringed central calorimeter of the D0 ("D-zero") detector will be sealed shut after a month of welding.

Though Brookhaven designed, engineered and built the central calorimeter, the completion of this major component of the 4,700-ton D0 detector at Fermi National Accelerator Laboratory (Fermilab) does not end Brookhaven's involvement in the experiment.

In fact, BNL will begin commissioning and testing the completed central calorimeter using cosmic rays this October.

"With major components of the D0 detector ready this fall, but no Tevatron colliding beam until next summer, we shall use cosmic rays to debug and calibrate our central calorimeter, and to integrate it with the other D0 components," explains BNL Physicist Wlodek Guryn, who supervised the production at BNL of the 64 modules making up the central calorimeter, and who now heads central-calorimeter commissioning and cosmic-ray testing at Fermilab.

During cosmic-ray testing, the on-line, data-collection software designed by BNL Physicist Bruce Gibbard, Physics, will first be put into use, as will the computer programs to analyze off-line the gathered data, developed by BNL Physicist Serban Protopopescu, Physics.

Gibbard and Protopopescu are assisted by three BNLers: Advanced Computer Analyst John Featherly and Research Associate Jan Guida, Physics, and Physics Associate Stephen Kahn, Accelerator Development Department.

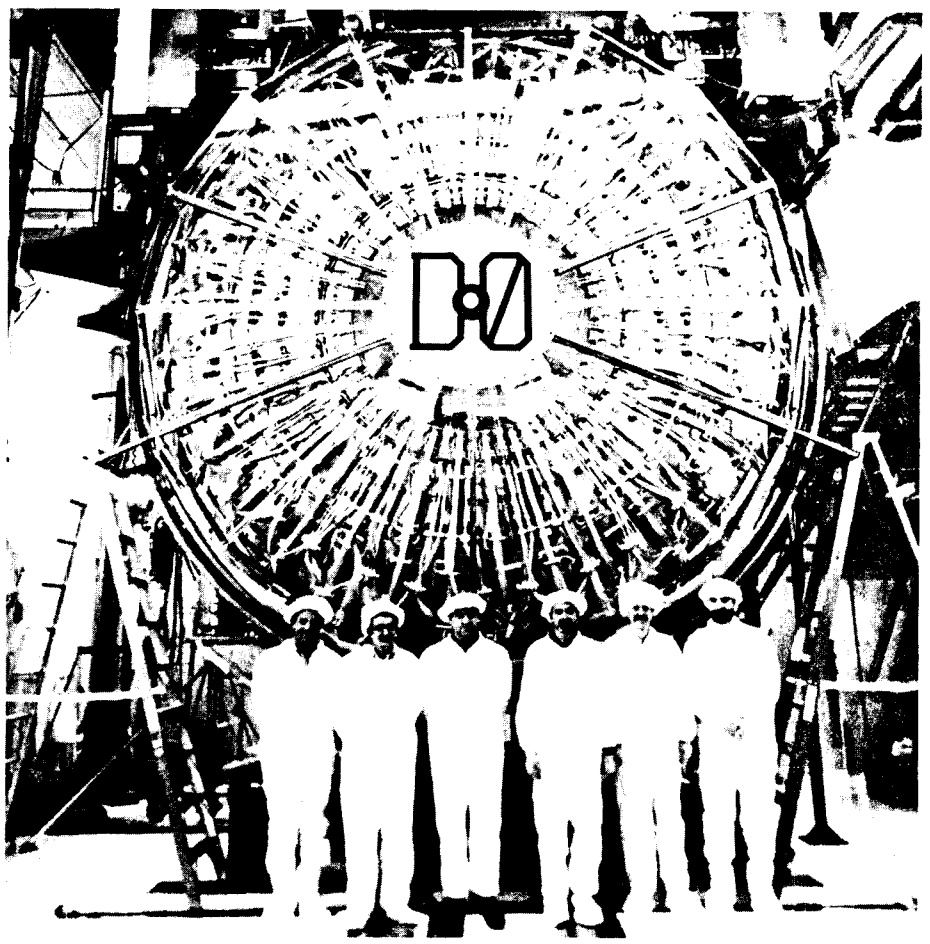
At the same time, BNL Senior Physicist Howard Gordon, Physics, and Physicist Peter Yamin, Alternating Gradient Synchrotron Department, will test spare modules for the central calorimeter in Fermilab's Tevatron I (TeV I) test beam. They will calibrate the modules' response to electrons and pions, as well as their interaction with D0 end-calorimeter modules.

The D0 detector is scheduled to take its first data from proton-antiproton collisions in the TeV I collider next July. It will be the second major experiment installed in TeV I, competing with the Colliding Detector Facility (CDF) in the search for the sixth and seemingly last undetected quark — the top quark.

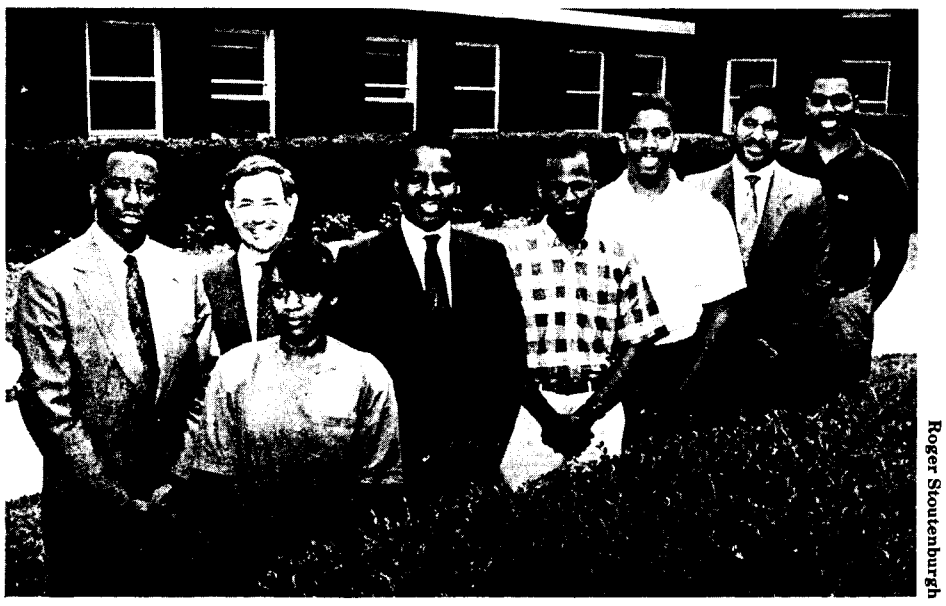
Quarks are thought to be among the most basic constituents of matter. Though high-energy physicists have been searching for the top quark since the late 1970s, it has proven elusive.

Intrigued and undaunted, D0 collaborators began constructing their

(continued on page 2)



Clothed in clean-room suits and standing in front of the cabled central calorimeter of the D0 detector within its cryostat prior to its being closed and welded are BNLers: (from left) Samuel Aronson, Serban Protopopescu, Wlodek Guryn, Bruce Gibbard, Stephen Kahn and John Featherly. Other BNL collaborators missing from the picture are: Howard Gordon, Jan Guida, Peter Kroon and Peter Yamin.



Roger Stoutenburgh

Shown with GEM Executive Director Howard Adams (left) during his visit to BNL earlier this week are (from left): BNL Deputy Director Martin Blume; GEM student Lisa Brown; Glenn Jennings, Assistant to the Director for Equal Opportunity; GEM students Alan Price and Jeffrey Chavis; Senior Equal Opportunity Representative Jeffrey Taylor; and GEM student Jon Polk.

A GEM of a Program

Less than four percent of the minority men and women who enter undergraduate engineering and science curricula every year go on to pursue a graduate degree. To help correct this situation, GEM — the National Consortium for Graduate Degrees for Minorities in Engineering, Inc. — was formed in 1976 as a nonprofit organization.

GEM was specifically created to assist Native American Indian, Black American, Mexican American and Puerto Rican students by financing graduate study towards a master's or Ph.D. degree in an engineering or natural science discipline at one of the consortium member graduate schools.

Also under the program's auspices, GEM students obtain practical engineering experience through summer internships at the work sites of consortium employers, which include most of the national laboratories and many Fortune 500 companies.

As a consortium employer, BNL was pleased to host GEM's executive director, Howard G. Adams, when he visited the Laboratory on July 9.

During his time here, Adams met with BNL Director Nicholas Samios; Deputy Director Martin Blume; Glenn Jennings, Assistant to the Director for Equal Opportunity; Donald Metz, Head of the Office of Educational Programs; and Jeffrey Taylor, Senior Equal Opportunity Representative, to discuss the Lab's participation in the GEM program.

Like other consortium employers, BNL is committed to providing GEM students with valuable work experiences and, if the students perform satisfactorily during the internship,

(continued on page 2)

AUI Distinguished Lecture

A Science Correspondent On Science and the Media

Science — pure, basic, simple. That is the way most scientists would prefer to think of their discipline, but like any intellectual endeavor, science is very much influenced by a host of social factors. One of the most powerful of these influences is the news media.

Depending on the way the news media report a science event, the public will respond with belief or with doubt, with respect for the scientists involved, or with disdain.

John Noble Wilford, Pulitzer Prize-winning science correspondent for *The New York Times*, will address the issue of "Science and the Media" in an AUI Distinguished Lecture on Thursday, July 19, at 5 p.m.

In his talk at Berkner Hall, Wilford will discuss how the news media cover science, including examples of its successes and failures in providing timely, unbiased coverage of newsworthy stories. He will also explore how the news media influence the practice of science.

Twice winner of the Pulitzer Prize for his science writing in 1984 and 1987, Wilford's specialty is space science and exploration. He has covered all the major space programs, including the Apollo moon landings, the shuttle, and the Voyager mission. He also writes extensively on other scientific subjects, including archaeology and paleontology.

After receiving his bachelor of science degree in journalism from the University of Tennessee at Knoxville in 1955, Wilford went on to earn a master of arts degree in political science from Syracuse University.

In 1956, Wilford joined the staff of *The Wall Street Journal* as a general assignment reporter and later, specialized in medical research and the drug industry. He also became a contributing editor and science writer at *Time* magazine before joining the reporting staff of *The New York Times* in 1965.

John Noble Wilford

Wilford has authored five books on various science subjects. The newest, *Mars Beckons*, is due to be published this summer. In 1985, he was McGraw Distinguished Lecturer in writing at Princeton University.

It was 25 years ago that Associated Universities, Inc., began the lecture series, which offers talks by experts in fields as varied as science, journalism and politics. Wilford's lecture will be the second in a series of three AUI Distinguished Lectures at BNL this summer. On August 6, Alec Jeffreys will deliver a lecture on genetic fingerprinting.

Scouting Around

" 'Make sure your food's up high,' the ranger told us. So when we made camp, we slung the food bag on a rope 25 feet up in a tree. And still a black bear climbed even higher and managed to bring it down. We heard the commotion, and some of the troop gave chase. They got the bag back, just minus one set of breakfasts. You should have seen the effect of the bear claws on that heavy-duty army duffel bag, though — as if strong scissors had clamped right through it."

The speaker is Dave Brady, Physics Department. As a crew advisor of Boy Scout Troop 79 in Yaphank, he was describing an incident on one of his troop's high adventure camping trips. The camp was in upstate New York, down between Mount Marcy and Starlight Mountain, by Lake Cloud of the Tears — right where the Hudson River rises. And right where bears look on campers' food supplies as gourmet additions to their larders.

But the point of high-adventure expeditions for older scouts is to ensure that boys who are keen to go are well trained in wilderness and first-aid skills, and then freed to use their own judgment for whatever situations crop up. "We're just there in case something happens," said Brady.

"Each trip has its own set of stories," said John Nicolellis, an explorer advisor who works in the Alternating Gradient Synchrotron Department. He's another BNL'er who has led scouting activities both on Long Island and through wilderness, mountains and white water in Canada, Maine, the Catskills and the Adirondacks for many years.

Boy Scout advisors Don Brady (left) and John Nicolellis load equipment for a high-adventure camping trip with their troop.

Photos on this page by Roger Stoutenburgh.

"High adventure is really just something a young person hasn't done yet," Nicolellis continued. "But being able to handle the unexpected gives a foundation of confidence that is useful in other circumstances."

Growing up, Nicolellis and Brady were both Boy Scouts. As adults, they came back to help the troops their children joined. "We've been working together, off and on, since 1978," said Brady. "It takes a lot of time. I can be out four or even five nights a week sometimes. But there are so many activities available through the scouts that kids can develop new skills and attitudes — it's a good feeling and it's worth the effort."

Both Brady and Nicolellis have served in numerous capacities in scouting, including taking district administrative posts, training other leaders, and taking or instructing courses in Red Cross, canoeing, CPR and first aid.

Each has been awarded many honors commemorating the scouting community's appreciation of their work. These include, for both Brady and Nicolellis, the Silver Beaver, one of Boy Scouting's highest awards.

"The main reason scouting has lived so long is that it keeps changing," said Nicolellis. "We bring in people of all different specialities so they can pass on their interests. It's a program for the young that uses the outdoors and any other suitable interests to develop their self-reliance and good citizenship."

— Liz Seubert

Litterbuggy Ready for First Run

If there were no litterbugs on site, there would be no need for a Litterbuggy — an old, electric golf cart that has been transformed into BNL's newest on- and off-road vehicle for picking up roadside and lawn litter.

White with red and blue trim, the Litterbuggy is the handiwork of the Heavy Equipment Shop in the Plant Engineering Division (PE), with assistance from the Sign Shop.

Pictured with the Litterbuggy, which was completed at the beginning of the month, are: (from left) Heavy Equipment Maintenance Supervisor John Niemczyk, and Heavy Equipment Mechanic-Operators John Braband and Ralph Giordano Jr.

Unlike a truck, the Litterbuggy can be handled by one member of PE's Grounds & Sanitation crew and can be driven on grass or pavement. So it is the vehicle of choice for litter collections, which are held once a week or so.

Working in their spare time since last fall, the Heavy Equipment Shop crew actually built the Litterbuggy out of two worn-out golf carts formerly used for transport around site.

To suit the vehicle to its new purpose, the shop added low pressure, wide tires so that the Litterbuggy won't damage BNL's lawns. In addition, Litterbuggy's litter box can be tipped backwards, to dump what is collected into the bucket of a load-lugger truck.

DO Calorimeter (cont'd)

detector in 1984, naming it for the experimental hall at TeV I where it will reside. Scheduled for completion by next July, the D0 detector will be the product of 23 institutions from three countries. This collaboration is headed by BNL Guest Physicist Paul Grannis, Professor of Physics at the State University of New York (SUNY) at Stony Brook.

Under Grannis, about 200 physicists have been working on the hardware and software for D0's four major components: the central detector, central calorimeter, end calorimeter, and muon detection system. BNL was given responsibility for the detector's central calorimeter and software.

Within BNL's Physics Department, the D0 central calorimeter effort is led by Physics Department Deputy Chairman Samuel Aronson and Howard Gordon, who heads the department's Omega Group.

The central calorimeter will measure the direction and energy of particles showering at large angles from quarks and gluons produced by the collision of protons and antiprotons. It will also accurately measure the energy of electrons, which are important signatures of top-quark decays.

Last summer at Brookhaven, the Omega Group completed the five-year design, engineering and production of the 32 electromagnetic (EM), 16 fine hadronic (FH) and 16 coarse hadronic (CH) modules that make up the central calorimeter's three concentric rings.

All modules, including test-beam spares, were shipped to Fermilab, where they were stacked inside their common cryostat. With installation supervised by BNL Guest Physicist Robert McCarthy of SUNY at Stony Brook, the inner ring of EM modules, middle of FH and outer ring of CH modules were complete circles by last October.

After cabling the modules, the cryostat was closed and welding begun. "Installation, cabling and closure went very smoothly — very much according to the plans of Peter Kroon, our head engineer," comments Guryn.

Once the cryostat is welded shut, the central calorimeter will be moved into place within TeV I, pumped to vacuum and filled with its active medium — 5,000 gallons of liquid argon at −312°F — prior to testing.

Using cosmic rays, the central calorimeter will be commissioned and tested together with D0's central and muon detectors. Meanwhile, D0 end-calorimeter modules will be installed in their two cryostats.

"All indications are that the top quark is in the range of what D-zero can discover; so, next July, we'll focus our physics on the top quark search," concludes Guryn. "Though their data sample was large enough to do a meaningful search, the CDF collaboration did not find the top quark during their last run, perhaps due to its large mass. So we think D-zero still has a good chance."

— Marsha Belford

In Memoriam

Sidney O. Thompson, who retired as a chemist in the Chemistry Department in 1973, died on June 8. He was 77 years old.

Thompson came to BNL in June 1947, the first black scientist appointed to the Chemistry Department. In 1969, he was part of a contingent of scientists invited to see the rocks brought back by the first moon mission. After his retirement, he returned to the Lab as a research collaborator, through 1987.

He was a resident of Hempstead, and he is survived by his wife Mary; two sons, David of Richmond, California, and Charles of Manhattan; and a sister, Amy Thompson of Manhattan.

Arrivals & Departures

Arrivals

Jerry S. Chang.....AGS
Steven Halderman.....Central Shops
Donna M. Larsen.....Fiscal
Congxin Liang.....Chemistry
Ruimei Ma.....Medical
Noreen B. O'Donnell.....Tech. Info.

Departures

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

Bernard F. Brehm Jr......Plant Eng.

Gem Program (cont'd)

to consider offering them full-time employment after completion of the graduate academic program.

While on site, Adams also visited prospective GEM students, met with the four GEM interns who are now in the midst of the 12 weeks they are spending at Brookhaven this summer, and conferred with the interns' BNL supervisors.

The four current GEM students are: Lisa Brown, a new graduate of Morgan State University, who majored in industrial engineering and is working with Gary Adams, a research engineer in the Safety & Environmental Protection Division; Jeffrey Chavis, who is majoring in electrical engineering in the master's program at the University of Maryland and is working with Gregory Bagley, a research engineer in the Accelerator Development Department; Alan Price, a graduating senior from the City College of New York, majoring in civil engineering and working with James Mills, a project engineer in the Alternating Gradient Synchrotron Department; and graduating senior Jon Polk, an industrial engineering major at New York Institute of Technology now working with Martin Howard, a project engineer in the Physics Department.

In BNL's Office of Equal Opportunity, the GEM program is administered by Jeffrey Taylor. He described the selection process for the GEM program as being "extremely keen — it's such an intense competition because employers know that these students are the future, in terms of the diverse work force that's coming into being right now. It's a cost-effective way to recruit excellent people. Smart institutions like BNL are getting into this program."

Summer Bluegrass Concert

From Kentucky to the Adirondack Mountains to Long Island, bluegrass is a favorite of country music enthusiasts everywhere. Next month, bluegrass fans at BNL will be able to hear their favorite music performed live in Berkner Hall. On Friday, August 3, at 8 p.m., the Fox Family Bluegrass will perform in a summer concert presented by BERA.

Winners of the talent contest at the Winterhawk Bluegrass Festival in 1989, the Fox Family Bluegrass is a group of four young musicians who are natives of New York's Adirondack Mountain area. The quartet, composed of a fiddle player, a banjo player and two guitarists, made their initial debut in their small hometown of Old Forge. Since then, they have performed in numerous concerts and music festivals in upstate New York. They also recently performed at the Eagle Tavern in Manhattan.

Tickets for the concert cost $6 each, and may be purchased at the door on the night of the performance. They also may be purchased in advance at the BERA Sales Office in Berkner Hall from 9 a.m. to 2 p.m. daily, or after 2 p.m. at the Recreation Office in Personnel, Bldg. 185.

Tickets can also be purchased from: Rick Backofen, Bldg. 197B, Ext. 2973; Michelle Cummings, Bldg. 459, Ext. 2077; Elizabeth Pergan, Bldg. 179A, Ext. 2973; Jean Ramirez, Bldg. 197C, Ext. 2119; Maryann Reynolds, Bldg. 703, Ext. 5241; and Sharon Smith, Bldg. 510A, Ext. 3995.

Fox Family Bluegrass

First in the Empire

Roger Stoutenburgh

First among small teams with less than 15 members — that's where the BNL Swim Team in their fourth season in the Empire State Masters Swimming Competition. The 1989 team includes: (from left) Maryanne Kmit, who was first among women ages 19-24; Roger Klaffky; Swim Club President Ron Wittlock, second among men 50-54; Team Captain Peter Heotis, third among men 35-39; and Marsha Belford. Missing team members are: Wlodek Guryn, second among men 35-39; Paul Michael; Pavel Rehak; and Toshi Sugama.

Summer Shape-Up

The Aerobic Dance Club is holding two programs this summer: Monday stretch, and Tuesday and Thursday aerobic dance classes. Both sets of classes run from 5:15 to 6:15 p.m. A mat is suggested for floor exercises in both.

The fee for each session is $24. Stretch classes are held in Physics, Bldg. 510, and aerobic dance is held in the Recreation Building. For more information, call Bill Leonhardt, Ext. 2378, or Janet Sillas, Ext. 2345.

Public Sale Of Motor Vehicles

Forty-seven vehicles, now located at Warehouse T-87, will soon be available for public sale.

Inspection will be permitted on Wednesday and Thursday, July 18-19, from 9:30 a.m. to 3 p.m. An open auction will be held Friday, July 20.

This will be an informal, competitive bidding. For more information, call Ext. 2302.

BROOKHAVEN BULLETIN

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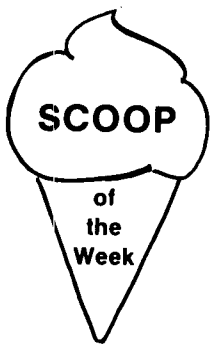
Attn: Train Riders — Schedule Change

Due to the Long Island Railroad's current Harold reconstruction project, the departure time for the afternoon BNL courtesy car to the train station has been changed.

Effective immediately, the Lab driver will pick up passengers at Public Affairs, Bldg. 134, at 5:30 p.m., then at the Brookhaven Center at 5:35 p.m., to meet the train that departs from Patchogue at 6:32 p.m. and arrives in Pennsylvania Station, New York, at 8 p.m.

This change will remain in effect until Harold reconstruction is completed, on September 3.

Scoop of the Week



For the scoop on next week's BNL Food Drive, Carole Kerr, Director's Office, is rewarded with the Scoop of the Week.

If you wish to enter the third annual Scoop of the Week contest, rush your news and feature scoops to the Bulletin, Bldg. 134, or call Ext. 5053. If you scoop the Bulletin's informed sources and a story based on your idea is published, you'll win an official certificate for soft-serve, frozen yogurt, redeemable anytime at the Cafeteria.

IBEW Meeting

Local 2230, IBEW, will hold its regular monthly meeting on Monday, July 16, at 6 p.m., in the Knights of Columbus Hall, Railroad Avenue, Patchogue. On the agenda will be regular business, committee reports and the president's report.

Where Have All The Women Tennis Players Gone?

There are five events scheduled for the Lab's annual Tennis Tournament, but sign-up this year has been near its lowest level ever for the women's singles and women's doubles events. To encourage more women and men to enter, sign-up has been extended until Monday, July 16.

The tournament, which is scheduled to begin on July 21, is open to all BNL employees and their spouses, and Lab guests. The cost is $3 per person per event. Sign up in the BERA Sales Office, from 9 a.m. to 2 p.m.

Draw sheets will be posted at the courts and in the Sales Office on Tuesday, July 17. All matches will be scheduled and are to be played on or before the posted date.

For more information, call Tournament co-chair Ken Perkins, Ext. 2147.

Software Demo

On Wednesday, July 18, at 2 p.m., in the Computing & Communications Division Seminar Room, Bldg. 515, Ronald J. Bovitch of ARRS, Inc., will present his company's PC-based products for paper management, which include document and data-retrieval systems utilizing the latest advances in optical-disk storage technology.

The software permits full color, grey-level, and black & white document imaging. ARRS also cost-efficiently stores vast quantities of off-line ASCII data. Data can be downloaded for permanent archiving onto optical disks, while automatically creating unlimited look-up criteria.

On the Menu

At the Cafeteria

Luncheon served 11:15 a.m. to 1:30 p.m., grill open to 3:45 p.m., Cafeteria closes 4 p.m.

Monday, July 16

Soup: Cream of mushroom	.75/.95
Entree: Chopped beefsteak w/1 veg.	3.10
Entree: Fried catch of the day w/1 veg.	3.10
Fitness: Spaghetti w/marinara sauce	3.10
Carvery: Hot pastrami sandwich	2.85

Tuesday, July 17

Soup: Pasta gumbo	.75/.95
Entree: Knockwurst & sauerkraut w/1 veg.	3.10
Entree: Baked ziti w/1 veg.	3.10
Fitness: Chicken teriyaki w/1 veg.	3.10
Carvery: Hot oven-roast beef sandwich	2.85

Wednesday, July 18

Soup: Country Italian bean	.75/.95
Come in to see our Country Fair Special Menu.	
Carvery: Black Forest ham sandwich	2.85

Thursday, July 19

Soup: Chicken Calcutta	.75/.95
Entree: Cajun fish w/1 veg.	3.10
Entree: Fetuccini Alfredo w/1 veg.	3.10
Fitness: Chinese pepper steak over rice w/1 veg.	3.10
Carvery: Hot corned beef sandwich	2.85

Friday, July 20

Soup: New England clam chowder	.75/.95
Entree: Chicken fricassee w/1 veg.	3.10
Entree: Chef's special	3.10
Fitness: Broiled or baked catch of the day w/1 veg.	3.10
Carvery: Hot turkey sandwich	2.85

Breakfast w/coffee, 7:30 - 10:30 a.m. 2.65

Mon.: 2 eggs, bacon & pancakes
Tue.: Western omelet, French fries, toast
Wed.: Spanish omelet, home fries, toast
Thu.: 2 eggs, bacon, cheese on croissant, fries
Fri.: French toast, 2 eggs, bacon, home fries

Help Wanted at the Cafeteria

Service America Corporation, which runs BNL's Cafeteria, needs waiters and cooks. Service America is an equal opportunity employer. Anyone interested may apply in person at the Cafeteria or call Ext. 3541.

Don't eat before you swim —

Give it to the BNL Food Drive!

And please send Finast and King Kullen receipts to Carole Kerr, Bldg. 460.

Classified Advertisements

Placement Notices

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

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all non-scientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment.

Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Employment Manager, Ext. 2882.

The vacancies listed below have been exempted by the Director's Office from the current freeze on open requisitions.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

4278. OFFICE SERVICES POSITION - Requires knowledge of office practices and previous office experience, preferably in an engineering environment. Responsibilities will include photocopying and ozalid document reproduction, collating, distributing and filing reports. Will provide general assistance to engineers, architects and drafters in Division. Plant Engineering Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

4279. MANAGER, LABORATORY OPERATIONS SUPPORT OFFICE - Requires an engineering degree and substantial experience in the following areas: development and operation of maintenance-management systems for large facilities, implementation of operating procedures, and management of technical personnel. Will be responsible for the development of Lab-wide policies in the areas of maintenance management, conduct of operations procedures, space management and capital-asset management planning. Must be able to analyze regulatory requirements, and recommend policies and procedures to respond to these requirements. Reports to the Associate Director for Management and Physical Plant. Director's Office.

4280. TECHNICAL POSITION - Requires an AAS in mechanical technology or its equivalent, relevant experience and good communication skills. Knowledge of vacuum and cryogenic apparatus is highly desirable. Will be responsible for the fabrication and operation of experimental equipment such as cryostats and furnaces, and the maintenance of the the neutron spectrometers at the High Flux Beam Reactor. Work will involve close interaction with staff and visiting scientists. Chemistry Department.

4281. METAL WORKER-MAINTENANCE B - (Temporary) Under general supervision, constructs and installs a variety of metal equipment such as sinks, gutters, ventilating hood stands, etc. Operates machine tools and tinsmithing machines. Performs necessary brazing, welding and silver soldering incidental to the job. Requires previous experience in the trade. (Reposting of job number 4200.) Plant Engineering Division.

4282. VETERINARY SERVICES POSITION - Requires several years' relevant work experience and certification in Laboratory Animal Care. Will be responsible for the handling, general care, breeding of laboratory animals, and making clinical observations to the appropriate personnel. Medical Department.

4283. PROCEDURES COORDINATOR - Requires a bachelor's degree in engineering and a minimum of five years' recent experience in nuclear power plant operation and operating procedures development. Will be responsible for coordinating the updating of existing procedures and the development of new divisional procedures for reactor facilities, as well as reviewing training materials and working on audits. Must have excellent written and oral communication skills, and be able to obtain and maintain a security clearance. Reactor Division.

4284. TRAINER POSITION - Requires a bachelor's degree in engineering or education, 8-10 years' nuclear industry experience, maintenance training and instructional skills, supervisory background, and computer knowledge. Will be responsible for developing technician and technical staff training programs. Excellent oral and written communication skills are necessary, and exposure to DOE training accreditation procedures is desirable. Reactor Division.

Motor Vehicles & Supplies

89 TOYOTA SR5 - sports, am/fm stereo, tape, ac, much more, mint cond., $9,500 neg. 289-2159.

89 MITSUBSHI MIRAGE - 3-dr., a/t, am/fm cass., 13k mi., $6,000; '88 Toyota Tercel, 2-dr., dlx. h/b, a/t, ac, am/fm, 38k mi., $5,500. George, Ext. 4769.

87 FIREBIRD FORMULA - 5-litre, V-8, a/t, p/s, p/b, p/w, cruise, am/fm cass., 30k mi., excel. cond., $9,000. Chris, Ext. 4185 or 698-9116.

87 BRONCO II XLT - 5-spd., ac, p/w, p/l, cruise, 30k mi., extended warranty, visor, running boards, alarm, more, excel. cond. Richard, Ext. 2231.

87 WILDERNESS TRAILER - 33', queen bed, sleeps 6, 25' awning, many extras. 654-0810.

86 SUBARU GL-10 - 4wd turbo wagon, 16 mo. unlimited mi. warranty, 5-spd., every option, 80k+ mi., mint $6,000. Henry, Ext. 4547 or 727-7227.

86 PLYMOUTH HORIZON - 5-spd., p/s, p/b, 46k mi., am/fm cass., 2.2 litre, asking $2,600. Ext. 3731 or 331-7299.

86 CHEVY CELEBRITY - s/w, a/t, 5-spd., ac, am/fm, 84k mi., excel. cond., asking $3,900. Chen, Ext. 3369.

86 NISSAN PICKUP 4x4 - 50k mi., ac, am/fm cass., p/b, p/s, great topper, excel. cond., $6,500. Bruce, Ext. 2446.

86 HYUNDAI - 4-dr. h/b, 59k mi., 4-spd., new tires, $1,500. Ext. 4567.

86 PONTIAC FIERO - V-6, 56k mi., fully loaded, ac, stereo, car cover, black, sunroof, excel. cond., $4,400. 821-6048 eves.

85 FORD F-250 4x4 - 55k mi., new tires/rims, mint cond., $6,900 neg. John, 345-3527 after 5 p.m.

85 TOYOTA CELICA - p/w, sunroof, ac, am/fm cass., 5-spd., tinted glass, locks great, runs well, $4,900. Ext. 7654.

85 MERCURY LYNX - 52k mi., excel. cond., $2,000. Ext. 3285.

84 RENAULT ALLIANCE - sky blue, 2-dr., 78k mi., excel. cond., must sell, asking $800. Ext. 2294 or 286-7263.

84 RENAULT ALLIANCE - gray, 4-dr., a/t, ac, valve job at 85k mi., 2 new Michelin tires, $900 neg. Jan, 929-4522 or 345-3379 before 2:30 p.m.

83 BUICK REGAL - 6-cyl., 4-dr., ac, p/b, p/s, am/fm, 100k mi., new brakes & battery, good cond., asking $2,150. Dov, Ext. 4389 or 282-3129.

82 BUICK REGAL - 6 cyl., 4-dr., ac, new exhaust, brakes, battery, 78k mi., runs well, body perfect, $2,800 or best offer. Joan, 821-9048.

82 YAMAHA YZ-125 MOTORCYCLE - needs minor motor work, $450. Ernie, Ext. 3357 or 281-7873.

82 SUBARU DL WAGON - 5-spd., 125k mi., needs CV joint, well maintained, good cond. Brian, Ext. 7519 or 234-9487.

81 KAWASAKI 440 LTD - 12k mi., new brakes, chain sprockets, tires, sissy bar, v.g. cond., must sell, asking $700. 474-5715.

80 DATSUN 210 - 5-spd., am/fm cass., 95k mi., runs well, $350. Dong, Ext. 5510 or Ext. 3134 after 5 p.m.

80 DATSUN 510 - 4-dr. h/b, 140k mi., new brakes, good tires, runs well, $400 neg. Mark, Ext. 3812.

80 DODGE COLT R5 - 2-dr. h/b, 4-spd., am/fm, ac, 120k mi., needs work, asking $250. 928-0297.

80 DODGE ASPEN - 66k mi., a/t, p/b, p/s, 6-cyl., tuned-up, excel. cond., $800. Lee, Ext. 5790 or 3130 after 6 p.m.

80 OLDSMOBILE REGENCY 98 - ac, p/s, p/b, luxury interior, 40k mi. on engine, runs well, $1,500. 929-3620, leave message.

79 HORIZON TC3 - new battery & exhaust, body good, runs well, needs clutch, $300. Ext. 7707 or 821-0125 eves.

79 HONDA 750F - 18k mi., mint cond., must sell, $700 neg. Eric, Ext. 4452 or 447-9667.

79 PUCH MOPED - 1k mi., excel. cond., $175. Keith, 474-3863.

78 OLDS DELTA 88 - 4-dr., a/t, p/s, p/b, dependable, $600 neg. Maryanne, Ext. 5849 or 2420.

78 HORIZON - renovated, on sale below cost, $239. Ext. 3152.

77 VW BUS - runs OK, needs minor work, asking $300. Ext. 2294 or 286-7263

74 GMC PICKUP - ¾-ton, a/t, running, good tires & trans., needs engine work, make offer. Tony, 698-9274.

74 PLYMOUTH SATTELITE - 4-dr., 6-cyl., a/t, good station car, $125. Mark, Ext. 2521 or 878-4996 eves.

68 LINCOLN CONTINENTAL - white, black vinyl roof, needs work, $600. Keith, 474-3863.

63 HARLEY SPORTSTER - chrome swing arm, new tires & brakes, good cond., $2,000. Chris, Ext. 4185.

31 CHRYSLER - all orig., low mi., runs well, excel. cond., $7,000. Ext. 3160 or 289-5704 after 5 p.m.

HEADS - 2 pr. new Ford big block heads; new chrome gas pedal for all cars; new T.R.W. V-6 Ford lifters. Wayne, Ext. 3084.

TIRE - 6.45-14, w/5-hole rim, $10. Joe, pager 0925 or 728-1859 eves.

TIRES - 6, P215/75R15, Goodyear radials on chevy rims, good cond., $25 ea. Aron, Ext. 2434.

HITCH - class III trailer hitch, $20. Victor, Ext. 2395.

DODGE SWINGER MOTOR HOME - 25', sleeps 6, 34,810 mi., generator, ac, stereo, CB, excel. cond. Larry, 473-1456.

ROLL BARS - black, fits most small trucks, 2 off-road lights, good cond., $75. Pat, Ext. 3807.

CHROME - for fender wells for '70-'72, set of 4 still in pkg., $100; calinjection hood for '70-'72 Chevelles, $150. Bill, Ext. 2214.

TIRES - 4, P195/75R14, plenty of life left, $30 takes all. Ext. 5079.

CAP - for small pickup, $100. Dan, Ext. 4597.

Boats & Marine Supplies

25' WELLCRAFT - 260 Merc cruiser, new upholstery, very clean, runs well, $8,200. Jack, 281-4008.

24' C&C MIRAGE - 6 sails, spinnaker, rigged aft, race equipped, new 8-h.p. Evinrude, extras, mooring, cradle, $7,900. Damian, 744-5079.

21' INVADER - 1984, cuddy, 120 h.p. Volvo i/o, FWC, low hrs., excel. cond., in water, must sell, $6,900 or best offer. John, Ext. 2788.

19' BAYLINER - 1986, i/o, full canvas, DF, Magic roller trailer, $8,500 neg. Mike, Ext. 4988 or 281-3595 after 4:30 p.m.

19' - 1977, fiberglass, center console, '78 115 h.p. Mercury, '86 trailer, must sell quickly, will demonstrate, asking $3,900. Lou, Ext. 5385.

19' RINKER - 1986, cuddy, i/o 120, w/trailer, Coast Guard pkg., full canvas, $8,500 neg. Ext. 2223 or 929-6421.

16' MFG - fiberglass hull, 75 h.p. Johnson, Gator tilt trailer, $450 neg. Ext. 7697 or 689-2829, leave message.

17' SUPER CAT CATAMARAN - blue & yellow sails, good cond., $1,600. Larry, 473-1456.

16' O'DAY - day sailer, on blocks, $1,000. Elliot, Ext. 3947 or 475-3431.

15' CORRANDA - day sailer, ready to sail, $1,700. Steve, Ext. 3867.

14' HOBIE CAT - turbo, roller reefing jib, excel. cond., w/trailer, $1,500. Peter, Ext. 7657 or 298-9560.

13' BOMBARD - 1987, inflatable, '87 30 h.p. Mariner, trailer w/access., excel. cond., great scuba diving, must sell, $3,500. Rex, 474-5715.

8' DINGHY - fiberglass. Dawn, 758-3830.

Furnishings & Appliances

REFRIGERATOR - white, auto-defrost, 16.4 cu. ft., works well, make offer. Ext. 2679 or 472-6922.

BED - queen size, ½ yr. old, orig. $330, asking $180. Kan, Ext. 3731 or 331-7299.

RUG - 6'x9', nylon, plush, ivory, $45; 2 stereo speakers, $40. Ext. 3699.

COLOR TV - 13", 2 mo. old, remote control, must sell, leaving country, $150. Duke, Ext. 2957.

WASHER - Whirlpool, 2-spd., 4-cyl., $45; GE dryer, $35 or $65/both. Matt, Ext. 4216.

DESK - & chair, Lea, like new, formica top, maple, $200. Rose Ann, Ext. 5843/2549 or 281-1804.

STOVE - Magic Chef, electric, 20", harvest gold. 728-4495.

SHOWER DOOR - silver, never used, 30", $50; antique princess dresser, oak, great shape, $485; 9'x11' carpet, modern, $65. Henry, 727-7227.

KITCHEN WALL UNIT - w/sink & fittings, above & below cabinets, 5' long, $350; portable dishwasher, $45. Ext. 2378 or 758-3284.

TABLES - 3-piece living room set, 1 cocktail & 2 end, wood, contemp., well-made, excel. cond., $150/all. Margaret, Ext. 2529 or 588-7989 eves.

FREEZER - upright, old but good cond., $75 or best offer. Larry, 473-1456.

BED - queen size, best offer. 981-5696.

CAPTAIN'S CHAIRS - 4, unpainted pine, 1" thick, $75; 2 night tables, unpainted pine, $15. 929-4792.

FREEZER - Westinghouse, upright, like new, $100; wood-burning stove, orig. $650, sell for $375. C.L. Chen, Ext. 3152.

SOFA BED - good cond., 68" wide, double bed, could use new mattress, $75. R. Wilke, Ext. 3932.

WASHER - GE, heavy-duty, lg. capacity, 2 yr. old, excel. cond., $100. Ext. 2981 or 744-1440.

FREEZER - Hotpoint, upright, 14.8 cu. ft., excel. cond., $75. 878-1572.

Tools, House & Garden

POOL- Doughboy Timberline, 16', all disassembled, needs liner, make offer. Sue, Ext. 7235.

RED MAPLE TREES - Japanese, $15 to $50. 265-6542.

HAND TRUCK - steel, 2 wheel Global, stair-climber type, model 233560, ball-bearing wheels, 450 lb. cap, like new, $90. Bob, Ext. 2514.

STAIRS - attic, fold-down, $20. Victor, Ext. 2395.

Sports, Hobbies & Pets

BIKES - man's 26", 10-spd.; boy's 16" bike, $20; Action rower, $30; Ultrasonic humidifier, $15. King, 821-1933.

PIANO - Lester Betsy Ross, spinet, w/bench, excel. cond., $700. Tony, Ext. 3658 or 929-4903 after 6 p.m.

CAMERA - Kodak disc 3100, $10; Kodacolor disc film, $3.50/box; Sharp stereo w/radio & cass. recorder, $10; colognes, $2-$5 Warren, Ext. 4939.

CAMPING TRAILER - 14', all fiberglass, stove, sink, icebox, skylight, easy to tow, $850. Lou, Ext. 5285 or 281-3706.

ANIMAL CAGE - large, metal, $20. Penny, 929-4014.

FISH TANK - 15 gallons, used, $15; rock & roll albums, used, cheap. Ext. 2384.

Audio, Video & Computer

STEREO RACK SYSTEM - Soundesign, dual cass., turntable, more, good cond., asking $135. Ext. 3731 or 331-7299.

RADIO - Hallicrafter, model 572, portable, 1951, best offer. Ext. 3082 or 727-5912.

MONITOR - Hyundai, 12", monochrome w/tilt & swivel, hardly used, $50; Sharp Linytron 19" TV, $80. Ext. 3285.

Miscellaneous

RADAR DETECTORS - Passport, like new, $185; Escort, w/case, $125. Steve, Ext. 7936.

FAN - cools entire house, 24", 2-spd., timer, $30. Nancy, Ext. 5274 or 281-2767 eves.

BIRDS ON DRIFTWOOD - $18; printer box for collectibles, $18; army & Amish hats, $5/ea.; foreign wildlife stamps, 4/$1.00. Kathy, 744-2203.

Free

CATS - orange tiger, 1-year-old neutered males, gentle, love people. Tim, Ext. 3436 or 727-7741.

Car Pools

PLAINVIEW - Exit 43, LIE, 4th driver needed. Elliott, Ext. 2495.

Lost & Found

FOUND - batting glove, black leather, field 2, June 28. Karen, Ext. 4262.

FOUND - watch, in Chemistry, Bldg. 555, about 2 weeks ago. Call to identify. Lynn, Ext. 4303.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed, sex or national origin of the applicant.

For Rent

AMAGANSETT - Barnes Landing, 3 bdrms., 1 bath, walk to bay, beach, 5 min. to town & ocean. August-Labor Day, reasonable. 289-5770.

CALVERTON - 2-bdrm. townhouse, 1½ baths, w/w, appl., patio, deck, $750/mo. 878-0874 after 5 p.m.

EAST MORICHES - 2-bdrm. apt., ground floor of Victorian house, bath, kitchen, d/r, l/r, large yard, 3 blocks to bay, shops, school, $710/mo. + util. Mona, Ext. 5056 or 878-9384 eves.

EAST SETAUKET - 3-bdrm. ranch, 2 baths, 2-car gar., 5 new appl., 3VSD, $1,100/mo. + util., sec. & refs. Ext. 4368 or 928-3371.

MASTIC - 1-bdrm. apt., kitchen-l/r combo, bath and priv. ent., $475/mo. + elec. 281-1659 eves. & wknds.

NORTH SHIRLEY - 1-bdrm. furn. apt., l/r, kit., w/w, priv. ent., 1 person, nonsmoker, no pets, 5 min. from Lab, $500/mo. pays all. 281-8044.

PATCHOGUE VILLAGE - 1-bdrm. apt., full kit. and bath, w/w, fenced yard, priv. ent., furn. or unfurn., cable, $550/mo. pays all. 289-7902.

PORT JEFFERSON STATION - 3-bdrm. apt., all appl., a/c, bsmt., gar., nice area, close to shops, $850/mo. + util. Peter, Ext. 4094 or 751-6575 eves.

RIDGE - furnished studio apt., w/w, kitchen, bath, priv. fenced-in yard, 5 min. from Lab, nonsmoker, $525/mo., avail. Sept. 1. 744-8632.

ROCKY POINT - furn. studio apt., full kit., bath, l/r-bdrm. combo, nice area, one person, nonsmoker, $425/mo. incl. utils. & cable. 744-8659.

SOUND BEACH - 2-bdrm. ranch, 1 bath, l/r, d/r, eik, bsmt., w/d, Miller Place Schools, $900/mo. + util. & sec. avail. 9/10/90. Ext. 3790 or 821-4553.

SOUND BEACH - contemporary, master bdrm. w/cathedral ceiling, small bdrm. w/loft and skylight, kitchen, bath, d/r, $825/mo. + util. Erik, Ext. 4603 or 929-6945, leave message.

CATSKILLS - 3-bdrm. chalet w/sleeping loft, fully furnished, near Hunter Mt. Music Festival and Catskill Game Farm, fishing, hiking, rafting, golfing, etc. Kay, Ext. 4501 or Bea, Ext. 3642.

ROCKVILLE, MD - 2-bdrm. apt., furnished, near Washington, D.C., in July, reasonable. Ext. 3076.

BAR HARBOR, ME - on Echo Lake, Acadia National Park, 1-room cottage w/sleep loft, kitchenette, bath, fully furn., w/deck, $375/wk., July, August & September. Bob, Ext. 2514.

HILTON HEAD, SC - 2-bdrm. condo, sleeps 6, 2 baths, tennis, golf, pool, beach, July, Aug. & Sept., $425/wk. 689-5378.

SPRING HILL, FL - 2-bdrm. house, lakefront, 2 baths, Florida rm., patio, gar., priv. beach, monthly or longer, $550/mo. + util. Ext. 4530 or 261-2719.

For Sale

CENTERPORT - 200' waterfront on Northport Harbor, 4-5 bdrm., 4 baths, 0.6 acre, $595,000. Bob, Ext. 4044 or 261-3890.

CORAM - Tanglewood Hills, 4-bdrm. ranch, 2 baths, 2-car gar., huge attic, gas heat, fenced, sewers, new carpet & paint, $130,000. Ext. 3791 or 928-7154 after 7 p.m.

EAST MARION - beautiful 1 acre building lot, adjacent to Greenbelt. 325-0447.

EAST PATCHOGUE - 4 bdrm., 2 baths, 2 kitchens, den, 1½-car gar., fenced, priv., yard, poss. M/D, low taxes, $137,000. Duke, Ext. 2957 or 289-3586.

JAMESPORT - ¾ acre, walk to Sound, on cul-de-sac, beautiful area, price neg., terms avail. Ext. 5312 or 929-8467.

MASTIC BEACH - 3-bdrm. ranch, det. gar. w/Florida rm., low taxes, walk to water, $87,500, rent while in contract. Sue, Ext. 7235 or 395-3529.

MIDDLE ISLAND - Coventry Manor, 3-bdrm. townhouse, 2 baths, kit., l/r, d/r, laundry rm., cac, 5 appl., patio, pool, tennis, carpet, ask. $102,000. Rosalie, Ext. 3160 or 289-5704 after 5 p.m.

MIDDLE ISLAND - Lake Pointe, 2 bdrm., l/r-d/r area, cac, gas heat/hot water, all appl., wood deck off master bdrm., pool, tennis and clubhouse, ask. $77,500 neg. Bob, 924-7316.

NORTH SHIRLEY - 3-4 bdrm., 2 baths, new appl., deck, ½ acre, $134,000. Ext. 4113.

RIDGE - 3-bdrm. townhouse, 1½ baths, cac, w/w, all appl., upstairs newly carpeted, encl. redwood patio, storage room, low monthly main., 5 min. to Lab, price reduced to $93,000. Mary, 924-4328.

RIDGE/SCENIC HILLS - 4-bdrm. Colonial, 2½ baths, eik, d/r, l/r, w/w, gar., deck, ½ acre, minutes to Lab., $148,000. 924-7520.

SETAUKET - custom house, 3-4 bdrm., deeded beach rights, 3VSD. 473-4666.

SHOREHAM - 4-bdrm. Colonial, 2-car gar., sun porch, $2,000 taxes, $175,000. Barbara or Rich, 744-0960.

SHOREHAM - 3-bdrm. Colonial, 1½ baths, l/r, d/r, eik, den, fin., bsmt. w/sep. work room, gar., low taxes, 7 min. to Lab. $169,000. 821-9513.

BOICEVILLE, NY - in Catskills, 2-bdrm. house, English wood/coal stove in fieldstone enclosure, 4+ acres, woods and meadow, year-round brook, mountain views, many extras. 821-0469.

HUBBARDTON, VT - 38 deeded acres on town-maintained road w/power, phone, view of Lake Bonnoseen, ask. $39,000, neg. Tom,, Ext. 2823.

Wanted

HOUSE TO SIT - free, reliable, caring, exp., any duration after July 20. J. Allentuck, Ext. 2412.

COIN COLLECTOR - reputable. Ann Marie, Ext. 2882/2883.

VIOLIN - ¾ size, reasonably priced, for intermediate student ability. Ext. 7707.

FENCERS - looking for sparring partners, can teach if have own equipment. Peter, Ext. 7684.

SWING DANCERS - to go to Carnegie Hall for a night of dancing. Peter, Ext. 7684.

TUBED AUDIO COMPONENTS - working or not, by Marantz, Macintosh, Fisher, Futterman, Audio Research, Altec, Brociner, or WE. Jim, Ext. 4584.

OCEAN FISHING PARTNER - w/boat, will share gas, expenses. Feng, Ext. 7897 or 231-4135.

DEHUMIDIFER - for basement, Ext. 7697 or 689-2829, leave message.

CHILD SEAT - for 10-speed bike. Gary, Ext. 4532.

CLARINET - for young beginner. Garry, Ext. 5289.

ELECTRIC GUITAR - or other inexpensive musical instruments. Peter, Ext. 5634 or 751-7935.

GAY MEN AND WOMEN - to meet, discuss and socialize at the Brookhaven Center, Wed., July 18, 5:30 p.m. Questions? Ellen, (718) 636-1021.