BROOKHAVEN BULLETIN
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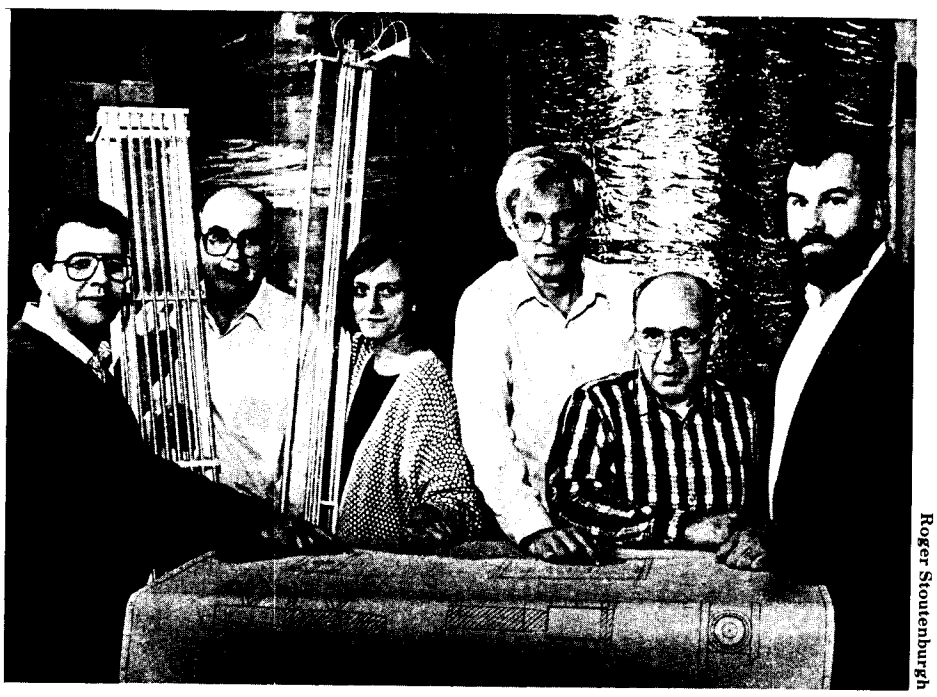
BROOKHAVEN NATIONAL LABORATORY

Seeing Through Color Transparency: Discovery at the AGS Supports QCD Concept

A series of experiments at BNL's Alternating Gradient Synchrotron (AGS) has shown that certain protons start to become transparent to atomic nuclei at an energy of six billion electron volts (6 GeV). As the protons' energy increases to 10 GeV, the BNL researchers and their collaborators found that the color transparency of the proton more than doubles.

Thus, the recent results of AGS experiment 834 (E834) give strong support to the quantum chromodynamics (QCD) concept proposed in 1982 by Al Mueller of Columbia University and Stan Brodsky of the Stanford Linear Accelerator Center — that the protons emerging from particle collisions at large angles are smaller than normal protons.

These results were obtained in the spring of 1987 by Don Barton, Gerry Bunce, Alan Carroll and Yousef Makdisi of the AGS, Steve Gushue of Chemistry, and their collaborators from Pennsylvania State University (PSU), the University of Minnesota and Southeastern Massachussetts University. Carroll and Steve Heppelmann, PSU, are the spokesmen for E834, which is funded by the U.S. Department of Energy's Office of Energy Research and the National Science Foundation.



Roger Stoutenburgh

At the Alternating Gradient Synchrotron (AGS) next year, Alan Carroll (third from right) and his collaborators plan to follow up on the interesting results of E834, but at higher energies. Shown with Carroll and working on a tight time schedule to complete the new EVA detector for E850 are some of the members of the design team: (from left), Fernando Barbosa of Southeastern Massachussetts University, responsible for the detector's high-speed electronics; Monty Montag, Physics, and Maryanne Kmit, AGS, designers of the detector components they are holding; and Lou Addessi and Jim Mills, both AGS, who direct the rebuilding of the superconducting magnet standing just behind them, as well as its 750-ton steel yoke.

Protons and Color Transparency

Protons are made up of three very much smaller constituents called quarks. Physicists tend to think of protons as having a fixed radius of about one ten trillionth of a centimeter, but Mueller and Brodsky suggested that this may not always be true. And indeed, E834 showed that smaller protons are involved in certain types of collisions.

Usually, the term "transparency" describes cases where light can pass through a solid unscathed. In particle physics, however, transparency refers to the way certain "small" protons can easily pass through an atomic nucleus containing other protons and neutrons. The E834 experimenters used atomic nuclei as a sieve to measure the size of protons seen in their experiment. The degree of transparency of the nucleus — how often the protons emerged unscathed — was a measure of the proton size.

The theory of QCD explains how quarks interact when held inside particles such as protons by the charge-carrying strong force. The charge for the strong force is called color, which comes in "red," "blue" or "green." The combination of the three is "white," or neutral.

Both normal and small protons are color neutral, or colorless. In general, the colors are not distinguishable, as when red, blue and green dots are viewed together on a television screen, resulting in white, a neutral state of color.

However, when a normal proton plows through an atomic nucleus, it is large enough for the colors of its quarks to be easily seen by the many protons and neutrons in the nucleus. This results in many collisions and absorption.

For a small proton, though, the quarks are so close together that their colors cannot be distinguished and the proton emerges unscathed.

Two and Two

When two protons collide at high energies, the quarks in the protons can temporarily lose their grip on one another. Impelled by the strong force, the quarks scramble to unite with other quarks. Usually, more than two new particles emerge from the interaction.

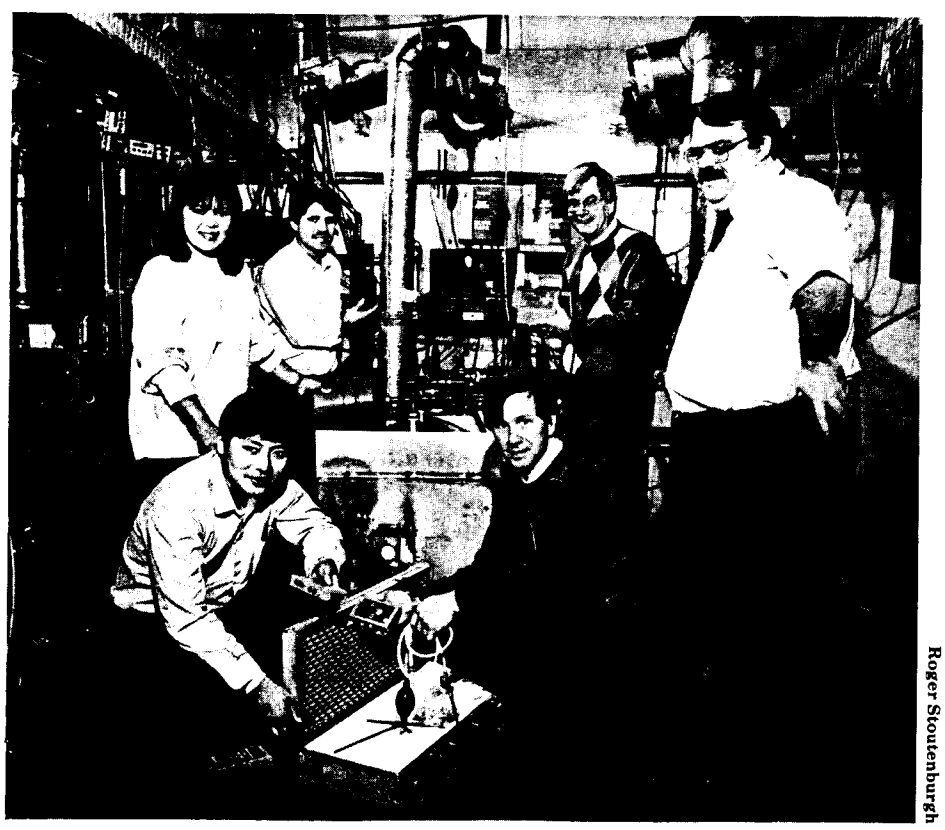
The quandary for physicists was — why, sometimes, did only two particles emerge, even at very high energy? Was there some new type of interaction responsible for these elastic reactions, part of a class of reactions known as "two-body exclusives" — two protons in and two protons out, at high energy?

These elastic reactions, and others where just two particles emerge, are the focus of E834. Because of the particular range of energies available

(Continued on page 2)

All Fired Up About Oil Heat Efficiency

As the cost of home heating oil has risen this winter, so has the concern of Long Islanders. About 12 million American homes — 20 percent of all homes in the U.S. — use oil heat. The majority of those homes are in the Northeast, and, in particular, on Long Island.



Roger Stoutenburgh

Members of the Combustion Equipment Technology Program (CETP) in BNL's Department of Applied Science (DAS) perform an emissions analysis of a prototype, low firing-rate oil burner at their computerized laboratory in Bldg. 526: (clockwise from bottom left) Wei Gang, visiting researcher-collaborator from the People's Republic of China, and DAS researchers Ruth Coughlan, Yusef Celebi, Richard Krajewski, Roger McDonald and Thomas Butcher.

It is fitting, then, that BNL, the only national laboratory located in the Northeast, is home to the only major oil-heat research effort in the nation.

Funded by the U.S. Department of Energy's Office of Buildings and Community Systems, the Combustion Equipment Technology Program (CETP) in BNL's Department of Applied Science (DAS) aims to increase heat efficiency and advance technology for the oil-fired heating industry.

"We respond to the oil-heat industry's need to develop technology for energy-efficient products," said Roger McDonald, head of CETP.

Currently, for example, CETP is looking at ways of breaking down fuel into smaller, finer droplets for more efficient, cleaner combustion. Within DAS's Division of Buildings and Community Systems, the CETP team includes: Thomas Butcher, Yusuf Celebi, Ruth Coughlan, Richard Krajewski and Jose Sanchez, in addition to McDonald. These researchers are also developing advanced diagnostics and controls for oil-heating systems.

For example, they are working on an optical sensor that detects changes in the flame quality of combustion. If successfully developed and transferred to industry, this sensor would work in conjunction with a thermostat warning light that would act much like an automobile warning light: It would alert consu-

(Continued on page 2)

Volunteers Needed For Fuel-Oil Study

If your fuel-oil company has to make frequent service calls to your home due to suspected fuel-quality problems, you may wish to volunteer for a new U.S. Department of Energy-funded study to be conducted by the Lab's Combustion Equipment Technology Program (CETP — see accompanying story).

Diverse crude oil sources and changes in refinery techniques have led to variations in fuel oil quality. These changes, as well as the presence of water in fuel, may eventually cause problems in home heating equipment. Common problems include plugging of nozzles, filters, fuel lines and possibly, tank corrosion.

The goal of the new CETP project at Brookhaven is to determine the range of concerns associated with fuel quality and to identify the effects of fuel property variations. Selected homes will have fuel tank samples analyzed regarding possible fuel-quality problems. Results will be provided to the homeowner.

To volunteer for the study, submit your name and BNL mail drop number to Ruth Coughlan, Staff Engineer, Bldg. 120. A survey form will be mailed to you and used by CETP to screen participants.

AGS Discovery (cont'd)

for the AGS particle beams, this accelerator is considered the world's best for these types of experiments.

Angles on Quarks

"We study collisions in which the protons emerge at large angles — that is, far away from their incoming directions," said Makdisi. He explained that, at these large angles, the collisions are particularly violent and elastic reactions are very rare.

But this is the region where color transparency should appear. "By measuring energies and angles, we could identify these rare elastic reactions. Then, we could compare their frequency for collisions with protons inside a heavy nucleus — one that's full of protons and neutrons — to collisions from bare protons — that is, hydrogen," commented Barton.

Results and Future Plans

The experimenters found that the protons started fitting through the holes in the sieve — the heavy nuclei — at an energy of 6 GeV. As the energy increased, more elastic reactions emerged from the heavy nuclei, as compared to hydrogen. This meant that the protons were becoming smaller until, at 10 GeV, the color transparency more than doubled. The increase with energy was predicted by QCD, since, at higher energy, the protons must be smaller to scatter elastically.

These results, then, appear to confirm the QCD prediction, although, warned Bunce, "The result is certainly not cut and dried. When we probed a little above 10 GeV, the transparency dropped abruptly."

The success of the prediction and experiment, and the unexpected behavior of the protons at higher energy have led to the proposal of a new experiment — to find out what happens with proton beams of up to 20 GeV.

As a result, Carroll and Heppelmann devised a radically different detector concept, which they called EVA, for a new experiment, E850, which should get under way in January 1991.

Said Carroll, "The new detector will measure particles all around the target, capturing 20 times more of these rare reactions. With the help of our engineers, designers, technicians and the Central Shops Division, we hope to get it built in record time — then get more information about quark interactions."

Credit Union Expands Services As Barclays Bank Leaves BNL

It's been almost ten years since Barclays Bank of New York took over operation of the bank on the Lab site from the Bankers Trust Company. With the close of business on Friday, March 30, however, Barclays will close its Upton branch.

In its place, the Teachers Federal Credit Union (TFCU) will set up shop in the bank building, Bldg. 193, on Technology Street.

Said Mark Israel, BNL's Fiscal Officer, "We hope to effect this change of on-site banks as smoothly as possible, with a minimum of disruption to our employees' personal financial activities."

The change is the result of a call for bids on the Laboratory's letter of credit and on-site banking arrangements, which was required last year by the U.S. Department of Energy, Chicago Operations Office. Some 22 commercial banks, including Barclays Bank, were solicited for proposals, but none wanted to operate an on-site bank branch.

TFCU, however, has agreed to a substantial expansion of their on-site services for employees. The credit union's move to larger quarters will take place on or about April 10, but TFCU has already begun disbursing more cash, as opposed to credit union checks, to members wishing to make withdrawals at its present location in Bldg. 179.

How will the change affect those now doing business with Barclays Bank?

To begin with, employees who have accounts at the Upton branch will soon receive a letter informing them of their options for switching to another Barclays Bank branch office. Those who do not respond by the specified date will automatically have their accounts transferred to Barclays' Rocky Point branch.

In addition:

- Current BNL payroll deductions for employees who have loans with Barclays will continue until their obligations are fully satisfied.
- New loans for repayment by payroll deduction will be accepted through Friday, March 23. After that, no new loans will be accepted for repayment by payroll deduction.
- Following the last weekly payroll and the monthly payroll for February 1990, no further employee deductions for Barclays savings account deposits or U.S. Savings Bond purchases will be made. Until the Lab finds an effective means of fostering U.S. Savings Bond purchases, these purchases must be temporarily suspended. Employees whose accumulated deductions are insufficient for purchasing bonds will receive refund checks from the Lab.
- Employees who wish to continue having their net paychecks deposited directly into their new Barclays accounts may elect to do so, but they must give the new account and branch information to the Payroll Office, Bldg. 134, as soon it is available.

All Associated Universities, Inc., Brookhaven National Laboratory payroll checks will now be drawn on the Lab's Morgan Guaranty Trust Company account. TFCU has agreed to cash Lab payroll checks for weekly and monthly employees, and guests who do not have their net pay directly deposited into a financial institution of their choice. TFCU has also agreed to cash employees' personal checks drawn on banks other than the credit union, as long as the employee is a member and has sufficient funds on deposit to cover that check.

"Teachers Federal Credit Union is entering this relationship with the utmost of enthusiasm," said Israel, "and is eager to provide any and all services for our employee and guest population that banking regulations will permit." About the only service that the credit union will not be able to perform is the exchange of foreign currency, and the Lab is pursuing alternatives for this.

Within the next few weeks, a TFCU mailing will go out to all employees describing the various services offered by the expanded on-site branch, and their related costs. These services include:

- direct deposit of Lab employees' paychecks.
- banking hours from 9 a.m. to 4:30 p.m. Monday through Thursday, and 9 a.m. to 5 p.m. on Friday.
- several off-site branch locations open on Saturdays from 9 a.m. to noon.
- automatic teller-machine service to be continued to be offered on site.
- savings accounts, checking accounts, money market accounts, holiday and vacation clubs, VISA and MasterCard accounts, traveler's checks, gift checks, certificates of deposit, IRA accounts, open lines of credit (similar to overdraft checking accounts), personal loans, auto and boat loans, and home equity loans at attractive interest rates.

Those with questions:

- about Barclays Bank accounts — contact Carol Neger, Upton branch, Bldg. 193, Ext. 2896.
- about TFCU — Lisa Goodenough, BNL Branch, Bldg. 179, Ext. 2790.
- about Lab-related banking or payroll matters — Mark Israel, Bldg. 134, Ext. 2494.

HMO Enrollment Now Open

Between now and February 26, eligible BNL employees can either join a Health Maintenance Organization (HMO), change to the AUI Group Medical Insurance Plan administered by Connecticut General Life Insurance Company, choose another HMO, or opt to keep their present coverage.

Effective March 1, BNL employees working 20 or more hours a week will be able to choose their next year's coverage from either the AUI Plan or one of five HMOs: ChoiceCare; Empire Blue Cross-Blue Shield Healthnet; Health Insurance Plan of Greater New York (HIP); Sanus; or U.S. Healthcare.

Under the AUI Plan, employees may choose any physician or health-care facility, and fees for services are reimbursed according to plan policies. In comparison, an HMO provides a number of health services on a prepaid premium basis for enrolled members. So, instead of charging a fee for each service provided, the HMO collects the premium fee from members' employers in advance.

That fee entitles the member to most health-care services, such as physician visits, surgical costs, x-rays, hospitalization charges and diagnostic tests. Some HMO services require a small copayment from the member, but most services are covered by the prepaid fee.

Associated Universities, Inc. (AUI) will subsidize the cost of an HMO by paying up to the premium amount it currently pays for the AUI plan. At this time, there will be no charge for employees who enroll in any of the HMO plans, unless they are also covered by the AUI Dental Assistance Plan. Employees who enroll in an HMO and the Dental Plan will pay monthly charges of $2.08 for individual and $5.20 for family coverage.

Representatives of the various HMOs will be at Berkner Hall on three consecutive Wednesdays — February 7, 14 and 21 — between 11 a.m. and 1:30 p.m., to answer any questions about their plans. Plan literature, including lists of participating physicians and application forms, will be provided by the HMO representative or can be obtained from Personnel Services, Bldg. 185, Ext. 2877.

To change coverage, employees must obtain the necessary forms from Personnel Services. The deadline for medical coverage changes is Monday, February 26, with coverage effective March 1, 1990, through February 28, 1991.

Oil Heat (cont'd)

consumers to a malfunction before a major breakdown occurs.

Designing more efficient venting systems for oil-fired heating appliances is also a CETP priority. "As oil burners become more efficient at burning fuel," McDonald explained, "traditional chimney-venting flue products can cause problems. If the temperature of the chimney is too low, one result of better heat exchange in the furnace or boiler, the system will not exhaust the flue gases properly."

For this reason, alternative venting methods are being studied, including sidewall venting. This method of venting through the wall could also result in energy savings of 5 to 10 percent, as well as resolve operational problems by reducing cold air infiltration into the house.

In Bldg. 526, CETP has a well-equipped, computerized laboratory with four test stations. Three of these are used for hot-water boiler testing, and the fourth is used for warm-air furnace evaluations. Gas analyzers are available for measuring potential pollutants. Software allows equipment to be operated and tested in both continuous and cyclic modes.

"Since the oil-heat industry is very competitive and composed of mostly small companies, it does not have any substantial funds for research or development," McDonald explained. "We help to fill that gap. Our goal is to be able to transfer the technology that we develop here to the oil-heat industry."

That's been the goal ever since the program was initiated in 1976. Since then, its accomplishments have included testing of modern flame retention-head burners now used in 3.7 million homes in the U.S. With this new heating technology, it is projected that by the year 2000 more than seven billion gallons of oil will be saved.

In the late 1970s, the program also did some of the research that assisted in the development of annual fuel-utilization efficiency standards (AFUE) for oil-fired furnaces. As a result, consumers can now determine how efficient their newer oil-fired furnaces are by their AFUE ratings, as manufacturers are required to list these ratings on heating systems.

To stay in close contact with the oil-heat industry, CETP hosts an annual technology transfer conference with national and international oil industry groups. Last year, approximately 200 industry representatives attended that conference at BNL.

In addition, CETP and its experienced staff are available to industry or other organizations for proprietary research and development on a full-cost recovery basis.

— Diane Greenberg

Photo by Roger Stoutenburgh

DAS Service Celebrated

Department of Applied Science (DAS) staff who celebrated major BNL service anniversaries in 1989 were guests at a recent luncheon given by DAS Chairman Leon Petrakis. At the celebration were: (standing, from left) Steve Heald, 10 years; Leonard Newman, hosting in Petrakis's absence; Robert Mills, 10; Donald Becker, 10; (seated, from left) William Medeiros, 10; Ellen Fredrickson, 10; William Behrens, 10; and Arlene Waltz, 10. Absent from the picture were: Bernadette Christian, Masaki Suenaga and Susan Walch.

Coming Up

Best-selling author Mark Mathabane will draw from the experiences that he described in his most recent book, *Kaffir Boy in America,* when he delivers the first Black History Month lecture on Tuesday, February 6. Mathabane's first autobiographical work, *Kaffir Boy: The True Story of a Black Youth's Coming of Age in Apartheid South Africa,* rose to number three on The New York Times best-seller list in 1987.

Sponsored by the Afro-American Culture Club, the lecture will begin at 8:30 p.m. in the Physics Seminar Room on the first floor of Physics, Bldg. 510.

Sexual Harassment In the Workplace

A panel discussion about "Sexual Harassment in the Workplace" will be featured at the next dinner meeting of Brookhaven Women in Science (BWIS). All employees are invited to attend the meeting, which will begin at 5:15 p.m., on Tuesday, February 6, in the North Room of the Brookhaven Center. An optional dinner will follow.

The program will begin with a presentation by the panelists: Virginia Brown, Women's Program Coordinator; Donna Friedman, Psychologist, Employee Assistance Program; Michael Goldman, BNL Legal Counsel; Glenn Jennings, Assistant to the Director for Affirmative Action: and Larry Runge, Manager, Safeguards & Security Division.

Their presentation will focus on providing information about Lab policies, procedures and obligations regarding sexual harassment. They will explain what an employee should do if feeling personally threatened and what support services are available.

The discussion will also include a forum through which employees can voice their concerns. Those who would like to submit questions for the panel but wish to remain anonymous should send them to Carmen Benkovitz, BWIS Program Committee Chair, Bldg. 51.

Reservations for dinner, at $15.95 per person, should be made through Flo O'Brien, Ext. 2265, by Friday, February 2.

Service Station Getting New Tanks

Today through Friday, February 16, the on-site Friendly Gulf Service Station will not be dispensing gasoline, while the station's underground gasoline tanks are being replaced. The dates could vary due to weather conditions and work progress.

The station will remain open during this period and continue to provide all other services, i.e., repairs, state inspections, etc.

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Volleyball

Standings as of January 19

Open League		League I	
GTEAM	34-5	Upfagrabs	30-3
Magnum	31-5	Dinkers	29-7
Phoenix	18-18	Cannonballs	24-15
Me and the Boys	16-23	Xrayted	18-21
Jet Setters	15-24	Up-Setters	11-28
Dig It	13-23	Rude Dogs	10-26
Penetrating Vollies	5-34	Network News	8-28

League II		League III	
Fossils	30-3	Lethal Women	23-1
Nuts & Bolts	27-5	MISfits	17-7
Pteropods	16-17	High Volley'em	16-8
Sourcerers	16-17	Nutcrackers	13-11
Net Wits	15-18	Renegades	12-12
Chunga's Revenge	13-20	Good Timers	11-13
Slammers	8-25	Bad Gnus	8-16
Upton-Ups	7-26	Spikes	4-20
		Turkeys	4-20

In Stormy Weather:
Dial 282-INFO

IRS Increases Some Taxable Premiums For Group-Term Life

The W-2 forms being mailed out by Payroll today will let all employees know how much taxable income has been reported to the Internal Revenue Service (IRS). In box 16A, you will see the amount by which your taxable income has been increased due to the way the IRS calculates the cost of employer-provided, group-term life insurance in excess of $50,000. If you were under 65 years old in 1989, this should yield no surprises. However, if you were 65 or over, you will find that your taxable income is higher than anticipated.

Late last year, the IRS revised the tax tables that are used to compute the cost of employer-provided group-term life insurance for employees over 64. The new IRS rates apply to all of 1989.

For those aged 65 to 69, the new tables set the reportable amount at $2.10 per $1,000 of coverage, reduced by the first $50,000 and less any premiums withheld during the year. For employees 70 and older, the rate is $3.76. Before the revision, the rate was $1.17 for everyone 60 and above.

To illustrate the effect of this change, assume an employee age 65 who has basic coverage of $50,000 and pays the premium of 35¢ per $1,000 per month for supplemental coverages I and II, totaling $100,000. The sum of $150,000 is reduced by $50,000, so the tax rate of $2.10 is applied to $100,000. Thus, for a full year's coverage, the reportable amount comes to $2,520. This is reduced by the $420 the employee already paid in premiums in 1989, so his or her taxable income is increased by $2,100. At the old rate, this increase would have been $984.

For Re-Entry Women Science Students Only

If you're a woman who had to interrupt your formal studies in the sciences, engineering or mathematics, but who is now back to the books, you may be eligible to win the Renate W. Chasman Scholarship for Women.

This one-time award of $1,000 is given annually by Brookhaven Women in Science to a woman who is currently enrolled or has been accepted in a degree-oriented program at an accredited institution. To be considered for the 1990 scholarship, you must be pursuing a program of study for 1990-91 at the junior or senior undergraduate level or first-year graduate level, on a half time or greater basis. You also must be a U.S. citizen or resident alien who lives in Nassau or Suffolk County.

If you're the winner chosen by an independent committee, the $1,000 award will be made directly to you in August, and you will be expected to complete at least two consecutive school terms in good academic standing.

For application forms and more information, contact Susan Hobbie, Ext. 7511. The deadline for applying is June 1.

First awarded in 1986, the scholarship honors the late Renate Chasman, noted BNL nuclear physicist and accelerator theorist. She co-designed the Lab's National Synchrotron Light Source and her work influenced the design of other synchrotrons around the world.

Local Users Group

The next meeting of the Upton Local Users Group will be on Wednesday, January 31, at 10:30 a.m., in Room B, Berkner Hall. All interested users are welcome. For more information, call Zohreh Parsa, LUG Chairperson, Ext. 4748.

Do you have a talent for dancing or singing? Do you know someone who's a class comic or a marvelous magician? You and your friends — whether talented BNL employees or talent from outside the Lab — all have a chance to be discovered at the BNL Talent Show to be held in Berkner Hall on Saturday, February 17, at 7:30 p.m.

The show will feature a variety of talent in the interpretative and creative arts. Those wishing to take the Berkner stage by storm should call Fran Ligon, Ext. 3709. The deadline for entries is today, Friday, January 26.

Bowling

Pink League
Maryann Reynolds had a 193, Renie Rosati 189.

White League
Joe Mayeski had a 257/629 scratch series, Fern Simes 199, Gerrie Riker 190, Sharon Jones 180, Pat Manzella converted the 6/7/10 split.

Purple League
Dennis Klein had a 208, Karen Vogel 206, Ron Picinich 202.

Red/Green League
T. Prach had a 215, R. Eggert 213, E. Meier 213, H. Dawson 211, R. Jansson 202, A. Sauerwald 202, E. Sperry 202, R. Mulderig 201, H. Ackerman 200.

Scotch Doubles Tournament
The Scotch Doubles Tournament will be held on Sunday, February 25, at 1:30 p.m., at the Port Jeff Bowl. The cost is $20 per couple. The tournament is open to BNL employees and immediate family members. Applications are available at the BERA Sales Office. If you need a partner or have any questions, contact Donna Cunningham, Ext. 4599, or Maryann Reynolds, Ext. 5234.

Arrivals & Departures

Arrivals

Zhiqiang Cai.....DAS
Leonard E. Engel Jr......S&EP
Mark Paul Sweet.....Medical
Ernest L. Tucker.....S&EP

Departures

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

William D. Staker.....Sfgrds. & Sec.
Enci Zhong.....Chemistry

Cafeteria Menu

Monday, January 29	
Soup: Chicken noodle	.75/.95
Entree: Beefaroni w/1 veg.	3.00
Entree: Baked potato stuffed w/broccoli & cheese	2.00
Fitness fare: Vegetable lasagna w/1 veg.	3.10
Carvery: Pastrami sandwich	2.85
Grill: Two Italian hot dogs	1.95
Tuesday, January 30	
Soup: Vegetable	.75/.95
Entree: Italian sausage hero	2.85
Entree: Turkey divan w/cheese sauce & 1 veg	3.10
Fitness fare: BBQ chicken w/1 veg.	3.10
Carvery: Roast beef sandwich	2.85
Grill: California burger w/fries	2.35
Wednesday, January 31	
Soup: Corn chowder	.75/.95
Entree: Chicken fajitas w/1 veg.	3.10
Entree: Stuffed peppers w/1 veg.	3.10
Fitness fare: Vegetable quiche w/1 veg.	3.10
Carvery: Hot corned beef sandwich	2.85
Grill: Reuben	2.85
Thursday, February 1	
Soup: Navy bean	.75/.95
Entree: Veal patty cordon bleu w/1 veg.	3.10
Entree: Stuffed pork chop w/1 veg.	3.10
Fitness fare: Tuna tettrazzini w/1 veg.	3.10
Carvery: Baked Virginia ham sandwich	2.85
Grill: Double cheeseburger	2.50
Friday, February 2	
Soup: Seafood chowder	.75/.95
Entree: Spaghetti & fish cakes	3.10
Entree: Yankee pot roast w/1 veg.	3.10
Fitness fare: Broiled sole amandine w/1 veg.	3.10
Carvery: Hot turkey w/cranberry sauce	2.85
Grill: Seafood nuggets w/fries	2.85

BERA Nominating Committee Named

The following nominating committee has been appointed by the BERA Executive Board to select a slate of four candidates for the 1990 BERA Board election scheduled for the last week in March:

Committee Member	Ext.
Robert Brown	3569
Roseann Callister	3142
Phyllis D'Avanzo	2950
Brigita Gordon	3426
Randy Hudson	4417
Pat Jencius	2300
Robert Lombardi	2238
Janet Sillas	2345
Fern Simes	3969
Ken Sutter	4514

Any employee who wishes to propose a nominee is encouraged to do so by contacting one of the nominating committee members before Friday, February 9. Please make certain that the person being proposed will agree to accept the nomination if selected by the committee.

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.

4145. ACCOUNTING POSITION - Requires AAS/BS in accounting and several years' experience in cost accounting. Responsibilities include the application of accounting principles for charges pertaining to the Special Maintenance Program, General Plant Projects, IHEM, Line Items and Special Studies. Additional duties will include checking invoices, recording and checking contract charges, preparing reports and accrual documents, and reconciling cost records to BNL Ledger. Knowledge of IBM PCs and spread sheet programs, preferably Excel or Lotus, required. Plant Engineering Division.

4146. METAL WORKER-MAINTENANCE A, GROUP LEADER - Plant Engineering Division.

4147. SPECIAL SERVICES ATTENDANT - Performs various service duties in connection with conferences, meetings and special events. Requires valid New York State driver's license. Staff Services Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

4148. INDUSTRIAL HYGIENIST/ENGINEERING POSITION - Requires MS or equivalent in industrial hygiene, toxicology, environmental health, occupational epidemiology or a related field, and several years' relevant experience. Broad background in all aspects of industrial hygiene and ABIH certification desirable. Safety & Environmental Protection Division.

4149. ENGINEERING POSITION - Requires MS/PhD in health physics and several years' experience. Strong analytical skills and experience in dosimetry, radioactivity measurements, ALARA engineering and QA for radiation protection desirable. Will be involved in R&D studies in radiation protection. Department of Nuclear Energy.

4150. ENGINEERING POSITION - Requires BS in safety engineering and the ability to conduct independent safety investigations. Knowledge in broad safety areas is required. CSP and/or PE certification desirable. Will support general safety program with responsibilities for program assessments, accident/injury investigation, safety training and electrical safety. Safety & Environmental Protection Division.

4151. ENGINEERING POSITION - Requires BSEE and five years' experience in industrial plant instrumentation controls; minimum 3 years' experience required within nuclear facility. Knowledge of process control instruments, pneumatic controls, analog/digital control circuits and a proven record of engineering experience in these areas. Will be involved in instrumentation design modifications for the HFBR, engineering assistance for maintenance and operations, and technical writing. Must be able to obtain and maintain a security clearance. (Reposting of job number 4127) Reactor Division.

4152. ENGINEERING POSITION - Requires BS degree in nuclear engineering or the equivalent experience and a minimum of 5 years' working background in reactor accident analysis. Will assist in the evaluation of a variety of reactor safety issues related to a research reactor. Must be able to obtain and maintain a security clearance. (Reposting of job number 4082) Reactor Division.

Motor Vehicles & Supplies

89 KAWASAKI ZX10 NINJA MOTORCYCLE - 1,000cc, black alum. frame, radials, extras, 6k mi., mint cont., $5,200. Charlie, Ext. 7638.

88 ISUZU PICKUP - 12k mi., ac, stereo, new tires, dark blue, 5-yr./50k mi. total warranty + free tow service, mint cond., $6,000. Phil, 821-2940.

88 GMC VANDURA VAN - ¾-ton, loaded, 2 ac, 2 heaters, TV, VRC, etc., excel. cond. 878-1178.

88 KAWASAKI NINJA 600R - cherry red/gray, 7k mi., excel. cond., a steal at $2,400. Dave W., Ext. 4978, 4544 or 744-2830.

87 TOYOTA PICKUP - extended cab, long-bed, a/t, p/s, p/b, am/fm, rear slider, bed liner, 33k mi., must sell, $6,250. Joe, Ext. 5213.

87 PROWLER TRAILER - 28', self-contained, never driven on road, excel. cond., asking $9,900. 567-6853.

86 PONTIAC FIERO GT - V-6, fuel inj., 4-spd., all factory opt., 29k mi., orig. owner, garaged, like new, $8,700. Ext. 3992 or 331-1003 eves.

86 HONDA REBEL MOTORCYCLE - low rider, 305cc, black, runs well, looks great, 3k mi., economical & fun, $750. Andrew, Ext. 7638.

85 OMNI GLH - turbo, 5-spd., new engine, clutch, alternator, black, good tires, fast, fun, very clean, $2,900 neg. Charlie, Ext. 7638.

85 TOYOTA SUPRA - silver, all options, performance package, 5-spd., 54k mi., asking $9,000. Ted, Ext. 4589 or 331-0415.

83 BUICK CENTURY - 32k mi., ac, p/s, p/b, am/fm stereo cass., new shocks, brakes, tires, orig. owner, $2,995 firm. Bob, Ext. 4446.

85 NISSAN 200SX XE - h/b, 29k mi., ac, p/s, p/w, 5-spd., loaded, warranty, $6,700. Bob, 744-4879.

84 OLDS OMEGA - 2-dr., p/b, p/s, am/fm, ac, 67k mi., good cond., must see, $3,000. Jim, Ext. 4606 or 654-5049 after 6 p.m

84 HONDA CRX - red/silver, 5-spd., clean in/out, runs well, must sell, asking $3,500. Ext. 4666.

84 SUZUKI RM250 - maintained in excel. cond., DG racing engine, new tires, chain, sprockets, water-cooled, very fast, $1,600. Glenn, 499-6341.

82 NISSAN MAXIMA WAGON - 56k mi., nice cond., eng. runs excel., always dependable, $3,150. Ron, 286-3386 eves.

82 TOYOTA COROLLA WAGON - maroon, 5-spd., 4-dr., 2 snow tires incl., excel. cond., $1,500. Lowenstein, Ext. 4611 or 286-2788.

81 DATSUN 510 - engine good, needs clutch, muffler, good for parts, best offer. Nancy, 698-0766.

80 PONTIAC TRANS AM 350 - new paint & tires, T-top, ac, am/fm stereo cass., alarm, all power, gray, red int., $5,000 neg. 929-6186 eves.

79 MONTE CARLO - 2-dr., black, v.g. cond., $1,800. Ext. 7828.

78 PLYMOUTH VOLARE - p/b, p/s, radio, runs well, good tires, new battery & alternator, asking $700. Chris, Ext. 4372.

77 PLYMOUTH GRAND FURY WAGON - 9 passenger, am/fm stereo, 2 new Michelins, reliable, $500. 744-1194.

71 DODGE W300 - power wagon chassis & drivetrain, 4x4, $1,500 takes all, will sell parts. Bob, Ext. 2957.

68 CHEVY CAPRICE - cheap, for parts. Bob, Ext. 5286.

65 DODGE DART - 4-dr., slant 6 motor, good for parts. Frank, Ext. 2314 or 567-5131.

63 CHEVY COVAIR MONZA - conv., red/red int., white top, completely restored, 4-spd., $4,500. Ext. 3992 or 331-1003 eves.

TIRE - new, 721 Firestone, 235/75R15, Eldo rim, $35. Ernie, 588-4987.

TRUCK CAP - fits small short-bed truck, silver, screened, tinted slider windows, purchased new '87, excel. cond., $375. Andrew, Ext. 7638.

TIRES - Goodyear Wrangler, P235/75xR15XL, 10k mi., 4/$175; bumper, rear step, minor dent, for full-size Dodge pickup. Glenn, Ext. 4612.

MOTOR - Ford 351c block, mint cond., many new parts, has to be assembled, $700. Keith, Ext. 7427 or 732-1415.

Boats & Marine Supplies

37' EGG HARBOR - double cabin, 1969, T/265 h.p. Palmers, ac, wet bar, swim platform, $25,000. Ron, 286-3386.

28' CAPE DORY SAILBOAT - 1975, Volvo diesel, fully equipped, must see, asking $25,000. Ext. 2382.

19' BOWRIDER CRUISER - 1972, w/1976 115-h.p. Johnson, Coast Guard pkg., trailer w/electric winch, $3,000. Frank, Ext. 2314 or 567-5131.

Furnishings & Appliances

FREEZER - 19.5 cu. in., orig., $700, asking $250. Pat, Ext. 5392.

WASHER - Kenmore, portable, 1 speed, 2 cycles, straight vane agitator, lint filter, etc., $200 or best offer. O. Booker, Ext. 3082 or 727-5912.

WALL OVEN - & cooktop, Roper, coppertone, oven needs new ignitor, otherwise excel., orig. approx. $135, now $200/both. Margaret, 588-7989.

MIXER - Kitchen Aid, model 4C, excel. cond., $35. 475-4891 eves.

DISHWASHER - Kitchen Aid, undercounter, works, $50. Ext. 2799.

BED - twin, w/mattress, box spring, frame & headboard, $40. Susan, Ext. 2184.

BUNK BED - $75; ship lamp, 4' wide, $65; baby's crib, $15. Ray, 289-0883.

SOFA - & loveseat, floral print, good cond., best offer. Joann, 878-4665 before 2 p.m., or leave message.

ROOM DIVIDER - 5 panels, light oak & wood, can paint, wallpaper, etc., like new, orig. $75, asking $30. Kim, Ext. 4461 or 3694.

RECLINER - wall hugger, new, grey velour, $125. Penny, Ext. 2625 or 467-8297.

LIVING ROOM SET - early American, coffee table, 2 end tables, excel. cond., $875. Ext. 3309.

WATER BED - king size, waveless, 6-drawer, pedestal, mirrored, headboard, $400. Bob, 744-4879.

RECLINER CHAIRS - 2, one beige corduroy, one cocoa brown corduroy, Scotch Guard treated, good cond. Dorry, Ext. 2078 or 286-0126 eves.

FREEZER - Amana, 16 cu. ft., good cond., $75. Bert, Ext. 5156 or 581-4436.

Deadline Today For Love Notes

Is there a special message you'd like to send to your valentine next month? If you can keep it short and sweet, you can have your Valentine's Day message printed in the Bulletin on February 9. Today is the last day to send your 15-to-20-word "love note" to the Bulletin, Bldg. 134, on a Sales & Notices Bulletin classified ad form marked "Valentine's Day." You must sign your name and include your life number and extension, but your name will not be printed unless it is clearly part of the message. Copy must be deemed tasteful, and all "love notes" will be accepted at the Bulletin's discretion. Only one message per employee, please.

Tools, House & Garden

LAWN MOWER - Sears, good cond., $50. Pat, Ext. 5392.

SNOW PLOW - Meyers, 7½' power angle, all hardware, fits Dodge, $400. Bob, Ext. 2957.

CIRCULATOR PUMP - Grundfos UP25-64SF, stainless steel, $40. Joe, pager 0925 or 728-1859.

Sports, Hobbies & Pets

FLUTE - Artley, good cond., $200 or best offer. O. Booker, Ext. 3082 or 727-5912.

PRINT - wood frame, $10; Kodak disc camera, new, $25; soccer ball, $5. Kathy, 744-2203.

RAFTING TRIP - to Cheat River, West Virginia, bus from Lab, April 20-22. S. Waski, Ext. 7592.

SKI - $10; poles, $5; boots, $10; skis w/bindings, $15; furniture, best offer; freezer, $150. Ext. 3496, Tues. & Thurs.

LOVEBIRDS - exotic colors, large cage, $125/pair. Kelly, 744-3069.

PUPPIES - Rottweiler, male, female, Rodsden/Shutzhund bloodlines, parents on premises, shots, wormed, dep. accepted. 758-9105.

FISH TANK - 55 gallon, w/stand & necessities, like new. Mike, 878-0516 after 4:30 p.m.

DARKROOM EQUIPMENT - Durst enlarger, timers, print dryer, paper safe, etc. Brian, Ext. 2799.

GUITAR - bass, Hondo, w/amp., good cond., $150; Rossignol skis, 200cm, w/Salomon bindings, poles, new cond., $50 firm. Keith, 732-1415.

SKIS - K2 610 FO racing/recreational series, no bindings, excel. cond., $40; Lange woman's ski boots, size 8, $30. L. Kukacka, Ext. 3065.

PUPPIES - AKC Rottweiler, born Dec. 7. Donna, 281-7942.

BMX PARTS - & accessories, quality Redline bars, frames, cranks, stems, wheels, leathers, helmet, etc., low cost. Bill, Ext. 4428.

TRUMPET - intermediate model, Getzen Capri, B flat, silver plated, excel. valves, slides, finish, no dents, $175 firm. Bill, Ext. 4428.

SKIS - Atomic Prisma, 170cm w/Tyrolia 470 bindings, Dynofit CD10 rear entry boots, size 8½. 473-2473.

Audio, Video & Computers

NINTENDO - w/7 cartridges, Punch Art, John Elway, Double Dribble, 10 yd. Fight, Baseball, Super Mario Bros., more. $150. Doug, 929-8912.

VIDEO CAMERA - RCA CC011, can be used w/video deck, $300. Ext. 4553.

COMPUTER SOFTWARE - Microsoft chart for Macintosh, never opened, business graphics program, $64. Joe, Ext. 4259.

SOFTWARE - games for IBM, Life & Death, Moebius, Silpheed, D&D, want to trade original packages only, no copies, Mark, Ext. 7978.

Miscellaneous

MUSIC BOX - wooden stage coach, $25; brass horse carriage, $25; large copper craft plate, $20; gold cherubs, $5, much more. Kathy, 744-2203.

SATIN GOWN - teal blue, worn once, dry cleaned, short puffy sleeves, scoop neck, back drop, waist size 6/8. Ext. 2950.

TICKETS - New York Islanders, Feb. 13, March 6 & 10, good seats, $30/seat. Michael, Ext. 7909 or 325-0447.

CLOWNS - for Valentine's Day, St. Patrick's Day, made to order. Bob T., Ext. 2314.

BRIDAL DRESSES - royal blue, sweetheart lace top, taffeta bottom, two size 12s, one size 16, $75/each. Joann, 472-6742.

TICKETS - 2, Les Ballets Trocadero, City Center, NYC, Feb. 11, $35/each. Mike, Ext. 4061.

MEN'S CLOTHING - new sports jacket, size 40, $20; wool sweaters, medium, $10/each; brown jeans, size 36, $10. Susan, Ext. 7716.

COAT - woman's size 5, beige wool; rabbit jacket, size 5, $50/each. Penny, Ext. 2625 or 467-8297.

Free

GUINEA PIG - 8 months old, male, tricolored with tank and accessories. Marie, Ext. 3228.

MASON PRESERVING JARS - several sizes. Fred Kuehl, Ext. 7947 or 588-2268.

CAT - gray tabby, spayed female, friendly, affectionate. Susan, Ext. 2184.

Car Pools

BOHEMIA-OAKDALE-SAYVILLE - need 2 more drivers for car pool, also can meet at Exit 59 LI Expressway. Frank, Ext. 2314.

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

CENTER MORICHES - 2-bdrm. apt., recently renovated, new carpet & appliances, $675/mo. + util. 878-1178.

FARMINGVILLE - 1-bdrm. cottage, cathedral ceilings, carpeting, OHWH, modern kitchen, bath, detached gar., corner plot, avail. March 1, $675. Chuck, Ext. 5327 or 698-9489 eves.

LAKE RONKONKOMA - 1-bdrm. apt., eik, l/r, bath, priv. ent., cable, w/w, own thermostat, 20 min. to BNL, ½ mile LIE Exit 60, $675 all, 1 mo. sec. 588-2477 after 5:30 p.m.

MIDDLE ISLAND - 4-bdrm. townhouse, 2 baths, d/r, l/r, kitchen, 2 skylights, pool, clubhouse, w/d, avail. April, $1,100. 924-3901.

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

PATCHOGUE - 2-bdrm. apt., l/r-d/r, eik, clubhouse, pool, new carpet, 15 min. from Lab, 1 mo. rent + 2 mo. sec. Diane, Ext. 2456 or 475-1564 eves.

SHOREHAM - 1-bdrm. apt., full kit., bath, l/r, no pets, $550/mo. incl. util., sec. 744-8659 or 744-0648.

SPEONK/WESTHAMPTON - 2 bdrm., 1½ baths, cac, skylights, approx. 1,000 sq. ft., pool, 20 min. to Lab, $800/mo. or $139,500. Rich, Ext. 4834 or 588-0507.

HILTON HEAD, SC - 2-bdrm. condo, sleeps 6, 2 baths, tennis, golf, beach, pool, $250/wk. Jan. & Feb.; $325/wk. Mar.; $425/wk. April-Oct.689-5378.

N. MYRTLE BEACH, SC - 1-bdrm. condo, sleeps 4, tennis, fitness, i/o pool, beach rights, next to golf courses, Golfer's Haven, Jan.-May, $245/wk. Joann, 472-6742.

For Sale

JAMESPORT - Hallockville Estates, ¾ acre, walk to Sound, terms avail., price neg. Kathy, Ext. 5312.

MASTIC - 3-bdrm. ranch, ¼ acre, 1½ baths, den, fin. bsmt., deck, appl., house fan, 3 ceiling fans, shed, fence, near school, shopping, 15 min. to Lab, ask. $115,000. 265-2366 after 6 p.m. wknds.

MIDDLE ISLAND - 3-bdrm. condo, 2 full baths, fenced, patio, tennis, pool, 6 mi. to Lab, $107,000. Ext. 3922 or 878-2604 eves.

PATCHOGUE VILLAGE - waterview, 4-bdrm. Colonial, 2 baths, eik, fd/r, fam. rm., f/p, balcony, deck, carpet, appl., gar., ½ acre, walk to pool, trains, schools. Jan/Emily, 286-3623 or 475-0090.

PORT JEFFERSON - Harbor Hills, 3 bdrms., 2½ baths, 2 kit., d/r, l/r, fam. rm., den/off., fin. bsmt., det. 2-car gar. new windows & carpet, priv. beach, country club, $289,000. 331-7350.

ROCKY POINT - 3-bdrm. high ranch, l/r w/brick fp, cath. ceiling, d/r, large kit., 2 baths, bsmt., cac, deck, 2-car gar. w/elec. doors, beach rights, 0.34 acre, $154,900. Kochman, 744-1057.

SOUND BEACH - 3-yr.-old 3-bdrm. ranch, 2 baths, l/r, d/r, eik, fin. bsmt., gar., w/w, carpeting, alarm sys., cedar deck, Miller Place SD, $145,000. Ext. 7918 or 744-3068.

WADING RIVER - 5-bdrm. multi-level contemp., pool, Jennair, Jacuzzi, wooded acre, reduced to $209,000 for immed. sale. Joe, Ext. 3172 or 283-0155.

WADING RIVER - ranch, 3/4 bdrms., fd/r, 2½ baths, eik, fam. rm., sun rm., deck, part fin. bsmt., dark rm., detached 2-car gar., $229,000. 929-4631.

YAPHANK - 3-bdrm. condo, 2½ baths, fin. bsmt., wood floors, ac, 5 min to Lab., $120,000. 751-2216.

TAMPA, FL - Paradise Village M.H.P., 1982 Liberty mobile home, 14'x56', 2 bdrms., 1 bath, family park, all appliances, w/d, cac & heat, awning & shed. Glen, Ext. 4638.

Wanted

HI FI COMPONENTS - old, tubed, working or not, by Marantz, Macintosh or Western Electric. 474-3766.

HEALTH ENTHUSIASTS - tennis, racquetball players, join league or at leisure. Ext. 4470.

LOVING HOME - for 2 house cats, declawed, neutered, spayed, 2½ yrs. old, brother & sister, indoors only, free. Jerry, 744-2816.

HOUSEMATE - to share Colonial w/professional, $345 + util. Jim, Ext. 2183.

SKIERS - to ski at Killington, VT, Mar. 2, 3, 4; walk to lifts; $165 inc. lifts & lodging; respond by 2/2 to Rick, Ext. 2973, or Augie, Ext. 3884.

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