



Solving equations with the new interactive software developed by Bruce Stewart (right), Department of Applied Science, are (from left) Hao Bai-Lin, who visited BNL from the Institute of Theoretical Physics in Beijing, China, and his wife and collaborator, Zhang Shu-Yu. The attractor on the screen represents the complex behavior of a dynamical model.

—Photos on this page by Roger Stoutenburgh

BNL Mathematician Develops 'A New Way of Doing Science'

There's a new way to study equations — through the inventiveness of Bruce Stewart, a mathematician in the Department of Applied Science who specializes in chaos studies.

Stewart has developed an original type of software designed to interact with dynamical problems in real time.

With this software, he can program an equation representing a model of complex dynamics and bring it to life on a computer screen. The swirling patterns that result are the graphic expression of fundamental phenomena that might occur from the general theory the equation expresses.

"It means that, once the program is written," said Stewart, "theorists can work with their equations as if they were doing an experiment. As soon as they want to try a new value, they just type it in, and the results come up right away on the screen."

Experimental Theorist

One of the first theorists to experiment with Stewart's system is Hao Bai-Lin, an internationally known Chinese physicist in the field of chaos. Hao and his wife, Zhang Shu-Yu, an economist who also works with her husband, recently visited

Brookhaven for a short part of Hao's sabbatical from the Institute of Theoretical Physics in Beijing.

Hao was already familiar with BNL, having made three previous visits. The first was a brief, three-day stay in 1980, when Chinese visitors were rare. Then followed two-week periods in 1985 and 1986, when he met occasionally with Stewart for talks.

This year, however, during discussions on symbolic dynamics, the two chaos specialists realized that a problem that Hao was interested in was ideally suited for study with Stewart's new software.

Stewart was delighted. "This was the first time that someone had brought in an entirely new problem," he said. "I was able to modify my software for it, and Hao and Zhang have been using it since."

Hao's equation — which he calls "very simple!" — is a nonlinear oscillator that can have many applications.

In one application, for example, new information may be obtained on how chemical bonds break inside molecules. The equation transfers successfully into the graphic interactive form because the new software

(continued on page 2)

Willis Returns to Head CAP

William J. Willis has been an experimental physicist for over 30 years, and he has been associated with BNL for much of that time. Now, he has returned to Brookhaven, as Head of the Center for Accelerator Physics, or CAP.

In announcing Willis's appointment, which was effective September 4, BNL Director Nicholas Samios noted, "Dr. Willis is no stranger to Brookhaven. He was a member of the Physics Department in the early '60s and a valuable consultant to the Laboratory for many years.

"For the past 17 years," Samios continued, "Dr. Willis has been involved in the development of sophisticated detectors and their successful application to a broad spectrum of particle physics research at CERN [the European particle physics laboratory in Switzerland]. Dr. Willis now has a joint appointment as Professor of Physics at Columbia University and Senior Physicist at our institution. I am looking forward to the exciting future of CAP under his leadership."

Samios added, "I also would like to thank Dr. Ilan Ben-Zvi for serving as Acting Head of CAP. He now will take on the duties of Deputy and will continue as Head of the Accelerator Test Facility [ATF]."

Ben-Zvi became Acting Head of CAP last spring, when Robert Palmer took on a special assignment for the Superconducting Super Collider in Texas. Acknowledging the "great job Ben-Zvi has done running things," Willis said he sees himself as "just one more person to help out with CAP."

Established in December 1986, CAP coordinates research into new methods of accelerating particles and producing synchrotron radiation that is being done throughout the Lab. A primary impetus for the center's creation was to develop the ATF.

The ATF, said Willis, "is intended to be the brightest accelerator anywhere." Brightness is the ratio of current to beam area. With a combination of high current and very small beam area, the ATF will be an extremely bright source of electrons.

"With this unique beam," Willis explained, "we would like to experiment with new ideas for acceleration and the handling of very, very tiny beams, on the order of one-millionth of a meter in size."

Under construction since early 1987, the ATF is expected to be commissioned before the end of this year.

While the ATF is the cornerstone of CAP, there are lots of other projects in the center's present and future.

One long-standing project is the switched-power linac, for which most of the work is being done in the Instrumentation Division. This concept, in which the power of a laser is used to "switch" an electron current to generate accelerating fields, was first proposed in 1984 — by Willis.

Other projects Willis will be guiding as Head of CAP are "ideas that Bob Palmer had for new power sources." Also, Willis said, "Palmer and Juan Gallardo, also of CAP, are working on studies for making beams brighter by correcting distortions due



William J. Willis

to the tendency of the electrons to repel each other."

In sum, said Willis, "It's a growing area — DOE appreciates that their labs' accelerator skill is a national resource, and BNL has a long history of accelerator expertise and close relationships with other laboratories. In fact, the other national labs agree that this is a good idea, and there are similar programs now at laboratories like Argonne and Lawrence."

Willis's long association with BNL began while he was pursuing his Ph.D. at Yale University in 1955. After earning his doctorate in 1958, he joined the staff of BNL's Physics Department as an assistant physicist. He was promoted to associate physicist in 1960 and physicist in 1962, before leaving the Lab in 1964 to return to his alma mater.

Willis remained at Yale for eight (continued on page 2)

Science Diplomats Tour Lab

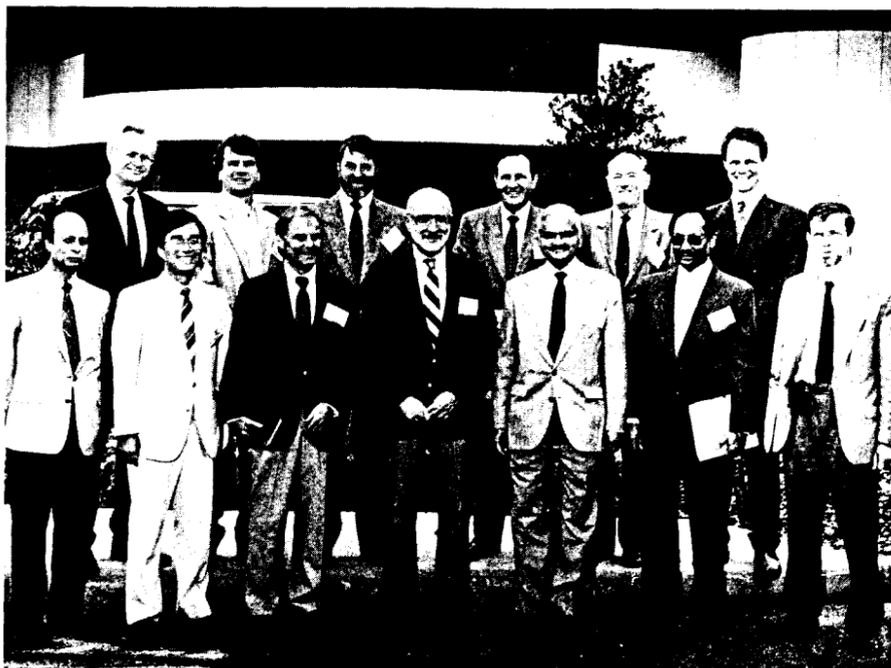
Ten countries sent 12 science and technology attachés from Washington, D.C. embassies for a firsthand look at BNL on Monday and Tuesday, September 10 and 11. Brookhaven is the second national laboratory visited by attachés who are members of the Science Diplomats Club in Washington, D.C.

According to Jerome Hudis (photo right, front, center), AUI Vice President for Programmatic Affairs, the purpose of the diplomats' visit was to expand their countries' knowledge of BNL's basic and applied research. So, included on their tour were presentations on BNL's high energy and nuclear physics research, global change studies and conducting polymer work.

Another goal was to encourage use of the BNL's facilities such as the National Synchrotron Light Source and Scanning Transmission Electron Microscope for collaborative experiments, training graduate students and post-docs, and sabbatical research.

The 12 expressed special interest in technology that the Lab is ready to transfer to industry, and were informed about BNL's patent and licensing procedures.

The science diplomats with Hudis are: (back, from left) Klaus Schroeter, West Germany; Harry Potma, The Netherlands; Norman Gomm, Australia; Niels Hauffe, South Africa; Brian Russell, South Africa; Frederick van de Linde, The Netherlands; (front, from left) Muhammad Yamin, Pakistan; Hai Sool Chin, South Korea; Leif Westgaard, Norway; Jai Gupta, India; Abdul-Mannan Turjoman, Saudi Arabia; and Remy Lestienne, France.



BNL Police Blotter

A drunken intruder was ransacking a first-floor room in Cavendish Hall on Monday morning, when the dorm room's occupant returned from the bathroom only to come upon the masked burglar.

"Around 7:30 a.m., I got a call from the occupant. This was a job for the Grounds crew, but they don't report until 8 a.m., so I called security," says Housing Supervisor Mary Glynn.

"At 7:48 a.m., we got Glynn's call but, since we couldn't trap the culprit, we decided to secure the room," reports Lt. Thomas DeSimone. After advising the occupant to vacate his premises, DeSimone and Patrol Officer James Johnson, both of the Safeguards & Security Division, staked out the room.

They found it wide open, but a note on the door said that the suspect was under the dorm-size refrigerator. Sure enough, he was still there — peering out from behind his mask and acting under the influence — so they locked him in.

Next at the scene of the crime came Keith Detmer and Joseph Lopez of Plant Engineering Division's Grounds crew — who bailed out a slightly tipsy baby racoon and released him in his own custody into the woods.

Circumstantial evidence indicated that, after the juvenile delinquent had entered the dorm through an open door or window, he sorted through the garbage — and drank some leftover beer in cans that he had knocked over — in the common kitchen before entering one of the rooms.

— Marsha Belford

Willis

(cont'd)

years as a professor. He left in 1973 to begin his research at CERN.

But Willis was never away from BNL for long. In 1978, for example, he returned as Head of the Detectors Division for the ISABELLE project. In 1981, at an ISABELLE Summer Workshop, he suggested a striking new idea — that the planned proton accelerator might also be used to collide heavy ions to create what he called "quark soup," a quark-gluon plasma akin to that which existed in the earliest instants following the Big Bang.

Though the ISABELLE project never came to fruition, the quark soup that Willis wants to sample may soon be cooked up in BNL's proposed Relativistic Heavy Ion Collider (RHIC). Already, researchers are getting the soup's flavor by doing heavy-ion experiments at BNL's Alternating Gradient Synchrotron, which has been able to accelerate heavy ions since 1986 and which will be the injector for RHIC.

While he is involved with a proposal for an experiment at RHIC, Willis has also been getting a taste of quark soup at CERN, with a new heavy-ion experiment at the Super Proton Synchrotron Collider. He'll return for some more sampling next spring and summer when the experiment runs again.

Meanwhile, Willis's teaching duties at Columbia will keep him near his home in Westchester for part of each week, and he'll make the commute to BNL to oversee CAP for the rest of his time.

PSI Meeting

Mary Hynes, a representative of Jewels by Parke Lane, will speak at the next meeting of the Upton Chapter of Professional Secretaries International (PSI), on Monday, September 17, at 6 p.m., in the south dining room of the Brookhaven Center. She will demonstrate how to wear scarves in various ways and present a jewelry show.

Correction

In last week's list of service awards, George J. Munoz was listed as having spent his 30 years at BNL in Chemistry. He has been in the Physics Department since starting at BNL on August 1, 1960.

Catch a glimpse of

GLANCE

playing in Berkner Hall weekdays, 11:30 a.m. to 1:30 p.m. Show changes every Tuesday.

Scoop of the Week

Herbert Kinney and Nicholas Samios, Director's Office, are both awarded scoops for informing the Bulletin that Lawrence Award winner John Dorning is a BNL alumnus.

For the lead on the crime reported in "BNL Police Blotter," Ollie Booker, Plant Engineering Division, is also duly rewarded with a scoop.

There's only one week left to summer, so get your scoops — ideas for news and features about BNL — into the Bulletin, Bldg. 134, or call Ext. 5053.

Inside Info

Anthony J. Romano, Department Administrator Manager in the Department of Nuclear Energy (DNE), has been elected Chairman of the Materials Science and Technology Division of the American Nuclear Society (ANS), for 1990-91. Romano has been involved with the ANS since his early years at BNL, when he was doing materials research in DNE.

Secretarial Specialist **Barbara Kponou**, Instrumentation Division, was elected Outstanding Member of the Year for 1990 by the Twin Forks chapter of Professional Secretaries International (PSI).

A member of the Twin Forks chapter since 1985, Kponou last year served as its recording secretary, ways and means chair, and organizer for the annual scholarship fundraiser. In addition, she was recording secretary for PSI's Inter-City Council, and she chaired the registration committee for the 1989 New York State Division PSI meeting.

Look! Limericks!

*In the name of BNL science,
We build every kind of appliance,
To be sure our particles
Are the genuine articles,
And not of nature's laws in defiance.*
— Martin Howard
Physics Department

*The world's a most amazing place,
To humans, that so curious race.
We strive to make sense
Of all things so intense.
And Brookhaven is setting the pace.*
— Keith Power
Accelerator Development Department

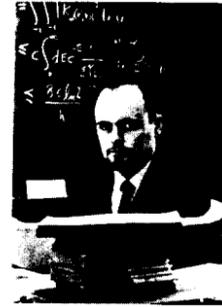
BNL 'Alumnus' John Dorning Wins Lawrence Award

On August 31, 1967, the Brookhaven Bulletin announced, "Dr. J.J. Dorning, Nuclear Engineering, was named winner of the Mark Mills Award of the American Nuclear Society."

Twenty-three years later, John Dorning is with the University of Virginia. But he considers himself a BNL "alumnus" — and he's still winning awards.

Dorning was one of six scientists selected in August to receive a 1990 Ernest O. Lawrence Memorial Award from the U.S. Department of Energy, for outstanding contributions in fields of science and engineering related to atomic energy.

Specifically, Dorning, a nuclear engineer, was selected "for his outstanding contribution to the development of advanced numerical and computational methods for the solution of practical problems in fission reactor statics and kinetics, neutron transport and fluid dynamics," and "in recognition of his exceptional leadership in nuclear engineering education and for instilling in his students high standards of professional excellence."



John Dorning at BNL in 1967

Dorning himself was a graduate student at Columbia University when he arrived at BNL in June 1963. After earning his Ph.D. in 1967, he became a member of the BNL staff in the Nuclear Engineering Department. He left BNL in 1970.

Dorning recalled his days at the Lab in an August 24, 1990, letter to BNL Director Nicholas Samios:

Since I was both nursed (did my Ph.D. dissertation) and weaned (worked for three years, first as an assistant physicist, and then as an associate physicist and group leader) at Brookhaven, and since I have many fond memories of Brookhaven and consider myself an "alumnus" of the Lab, I thought I should pass on to you the pleasant news that I received about a week ago... that I have been selected to receive the 1990 Ernest O. Lawrence Award. Naturally, I was thrilled with the news — as I imagine you were when you were selected to receive that award [in 1980]!

Since leaving Brookhaven I have been back as a summer visitor from time to time with the [Department of Nuclear Energy] group headed by Jim Powell and with the [DNE] group formerly headed by Mel Levine and Walt Kato; I also talk from time to time with Bruce Stewart [Department of Applied Science] about his research. Hence, my contact with the Lab continues...

At the University of Virginia, Dorning is the Whitney Stone Professor of Nuclear Engineering, professor of engineering physics and a member of the Center for Advanced Studies.

Mathematician

(cont'd)

runs on new and hugely powerful computing workstations — with the capacity to compute and display many solutions simultaneously.

"Thanks to the Computing and Communications Division [CCD], we have just the computer we need," said Stewart. "We're using the Personal Iris, which CCD has on loan from Silicon Graphics so that anyone from the Lab can try it."

The visual aspect of interactive graphics is not only a fascinating change from straight number crunching, but it can also save a lot of time. Using the new software on the appropriate computer, work that can take about two years on a computer with a smaller capacity, can be finished in a week or two.

Tech Transfer Potential

Stewart explained that his software has considerable potential for industrial use. "There's a new buzzword: navigation software," he said. "It provides the ability to watch a solution as it develops and 'steer' it in response to the graphics displayed on the screen. It can give better insight into any dynamic problems, such as you get in engineering, as well as research."

Although Hao and Zhang have left the Lab for Canada before returning to China, Stewart said, "This has just been a beginning." Their collaboration will continue, especially when Stewart goes to Beijing to lecture next year.

Said Hao, "I am very impressed by this software. It's really a new way of doing science." — Liz Seubert

Arrivals & Departures

Arrivals

Paul J. Bergh.....S&EP
Arthur T. Kost.....Plant Eng.
Pieter Kuiper.....Physics

Departures

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

Lawrence E. Day.....S&EP
Bruce A. Kavan.....Sfgrds. & Sec.
N. Blair Munhofen.....Chemistry
Yue Shen.....Physics

Volleyball

The first Volleyball League captains' meeting will be held on Wednesday, September 19, at noon, in Room 300, third floor Chemistry, Bldg. 555. Captains or team representatives must attend. Team rosters will not be accepted after this meeting.

Anyone interested in playing who is not already on a roster should contact either Kathi Barkigia, Ext. 7661, or Karen Savino, on Ext. 3513.

Don't Forget to Remember



Elephants never forget — but even if you have a memory like a sieve, or, like the White Rabbit, you have no time, you can still contribute to the BNL Food Drive. Just send your check, made out to "BNL Food Drive — C. Kerr," to Carole Kerr, Bldg. 460. You will be sent a receipt. Also, send any shopping receipts you collect from King Kullen and Finast, as, based on these receipts, these stores give a discount on food bought for the needy. The September pickup will take place all next week. Last month, donations totaled 2,220 pounds — let's try to top that!

Fine Chance to Bid on Fine Art



You may soon own a fine lithograph like the one shown here by R.C. Gorman if you are a lucky bidder at the art auction Brookhaven Women in Science (BWIS) will sponsor on Saturday, October 6, in Berkner Hall. While you are bidding for artworks by such notables as Marc Chagall, Leroy Neiman, Will Moses and Norman Rockwell, remember that part of the proceeds will benefit the Renate W. Chasman Scholarship Fund.

Run by Marlin Art of Deer Park, the auction will feature a variety of media, ranging from oils and watercolors to graphics and enamels. The artworks will be available for inspection starting at 6:30 p.m., and the auction will start at 8 p.m.

The \$5 admission fee, as well as part of the purchase price of the artworks are tax-deductible. The average prices for the auctioned works are expected to range between \$50 and \$200. Checks are preferred, but credit cards will also be accepted.

Refreshments will be served and a door prize will be awarded at the end of the evening.

The public is invited, and BWIS encourages your attendance even if you do not intend to purchase a work of art, since the percentage of sales that benefits the scholarship fund depends on the number of attendees — the larger the number, the bigger the percentage.

Tickets may be purchased now from Alyce Daly, Bldg. 197D, Ext. 5203; or Harriet Martin, Bldg. 477A, Ext. 3487. In addition, they will be available at the door on the evening of the auction.

Sign up for Stretch Or Aerobic Dance

It's September — time to think about getting back to class — with the Aerobic Dance Club. Instructor Pat Campbell will lead the classes on the fall program:

- **Stretch** — Classes involve a choreographed program of exercises that concentrate on stretching and strengthening various muscle groups.

- **Aerobic Dance** — Classes emphasize cardiovascular improvement through vigorous, choreographed exercise.

Classes in aerobic dance will be held on Tuesdays and Thursdays, while stretch classes will be held on Mondays. All classes run from 5:15 to 6:15 p.m. Participants may take any or all of these classes. Mats are recommended for floor exercises.

The fee for each ten-week session (M, T or Th) is \$30, payable at registration, preceding the first classes.

- **Stretch** — Monday, September 17, at Physics, Bldg. 510.

- **Aerobic Dance** — Tuesday, September 18, and Thursday, September 20, at the Recreation Building in the apartment area.

For more information, call Pat Campbell, Ext. 3483, or Janet Sillas, Ext. 2345.

Microcomputer Club

The next meeting of the BNL Microcomputer Club will be held on Thursday, September 20, at noon in the conference room in Bldg. 475. This will be a general membership meeting to discuss future programs and to nominate officers.

The club focuses on problems and news items in hardware and software for PCs, Macs and Amigas. Each month there are two meetings: an informal discussion work session on the first Thursday and a regular meeting generally with a featured speaker on the third Thursday.

For more details, contact Irv Montanez, Ext. 2540.

On the Menu

At the Cafeteria Luncheons

Monday, September 17	
Soup: Vegetable beef	.75/.95
Entree: Fried fish amandine w/1 veg.	3.10
Entree: Veal Parmesan w/1 veg.	3.10
Fitness: Chinese chicken & broccoli over rice	3.10
Carvery: Hot pastrami sandwich	2.85
Grill: Cheese melt	2.65
SPICE: Smile and say "fromage"	
Tuesday, September 18	
Soup: Split pea	.75/.95
Entree: Roast pork loin, gravy & 1 veg.	3.10
Entree: Cheese souffle w/1 veg.	3.10
Fitness: Seafood linguini w/1 veg.	3.10
Carvery: Hot roast beef sandwich	2.85
Grill: Meatball sub	2.85
SPICE: French bread pizza	
Wednesday, September 19	
Soup: Chicken noodle	.75/.95
Entree: Jambalaya w/1 veg.	3.10
Entree: Eggplant Parmesan w/1 veg.	3.10
Fitness: Chicken Dijon w/1 veg.	3.10
Carvery: Hot Black Forest ham	2.85
Grill: Patty melt on rye	2.45
SPICE: Vive la France	
Thursday, September 20	
Soup: Cream of spinach	.75/.95
Entree: Chicken cacciatore w/1 veg.	3.10
Entree: Meat loaf in mushroom gravy w/1 veg.	3.10
Fitness: Baked flounder w/1 veg.	3.10
Carvery: Hot corned beef sandwich	2.85
Grill: Tuna cheese melt	2.65
SPICE: French pastries in the morning	
Friday, September 21	
Soup: Seafood bisque	.75/.95
Entree: Maryland crab cakes w/1 veg.	3.10
Entree: Pasta w/meat sauce w/1 veg.	3.10
Fitness: Chef's choice w/1 veg.	3.10
Carvery: Hot turkey sandwich	2.85
Grill: Fried fish fillet	2.85
SPICE: Lighten up	
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	

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Note to Employees:

Attendance at lectures, meetings and other special programs held during normal working hours is subject to supervisory concurrence.

Coming Up

"High Performance Computing and U.S. Technological Competitiveness" will be addressed by Louise Nielsen, Director of High Performance Computing Solutions Development for IBM's applications-solutions business line. Sponsored by Brookhaven Women in Science, her talk will take place on Thursday, September 27, at 4 p.m., in the second floor conference room of the Computing & Communications Division, Bldg. 515.

Classified Advertisements

Placement Notices

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

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

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

For more information, contact the Employment Manager, Ext. 2882.

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

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants

4324. OFFICE SERVICES POSITION - Requires a minimum two years' office experience. IPAP experience highly desirable. Duties will include extensive data entry of purchase orders and RFQs as well as filing and general clerical duties. Contracts & Procurement Division.

4325. SAFETY ENGINEER POSITION - Requires BS or equivalent in industrial safety or related field, and three to five years' experience in construction safety. Will implement construction safety program, and provide health and safety guidance to construction project personnel. Knowledge of OSHA standards required and experience in asbestos abatement procedures desirable. Safety & Environmental Protection Division. (Reposting No. 4321)

4326. ASSISTANT BUYER - Requires experience in preparing solicitations, developing sources and purchasing standard commodities in a government or commercial environment. BA or equivalent in business administration or related field desirable. Will be responsible for the economical and efficient procurement of various tangible commodities with low monetary value. Will coordinate the complete procurement function from requisition to delivery, in accordance with standard Contracts & Procurement operating procedures. Contracts & Procurement Division. (Reposting No. 4309)

4327. TECHNICAL POSITION - Requires BS in chemistry, engineering, or related field or equivalent experience. Responsibilities will include a wide range of duties with regard to operations conducted at the Hazardous Waste Management site. Duties include on-site transport, handling and packaging of chemicals and radioactive materials, operation of light and intermediate range machinery, maintenance of protective equipment and record keeping. (Reposting No. 4185) Safety & Environmental Protection Division.

4328. CONTRACTS POSITION - Requires bachelor's degree in a technical field and significant experience in all phases of procurement with an emphasis on contract preparation, price analysis and administration. Will be responsible for drafting RFPs, developing contract modifications, evaluating proposals, and analyzing cost and man-hour estimates. Contracts & Procurement Division.

Motor Vehicles & Supplies

88 HONDA ACCORD LXI - 4-dr., champagne, 52k mi., p/sunroof, loaded, excel. cond., \$9,200. Don or Sue. 473-6570 after 7 p.m.

85 CHEVY CAPRICE CLASSIC - 9-pass., 90k mi., loaded, ac, p/s, p/b, roof rack, new batt., no rust, excel. cond., must sell. Zamir, Ext. 4510/3106.

82 DODGE RAM CAMPER VAN - sleeps 4, new battery & tires, 8-cyl., refrig., heater, 88k mi., excel. cond. 924-6129.

81 AUDI 5000S, 93k mi., loaded, good cond., \$2,000. 289-5770 after 6 p.m.

81 KAWASAKI 440 LTD - 121cc, new battery, brakes, chain, sprocket, tires, sissy bar, v.g. cond., must sell, moving, \$650. 474-5715.

80 FORD F250 4x4 PICKUP - 33" tires, eng. runs well, 3" lift kit, new brakes & transmission, cap, tool box, 4 extra tires. Ext. 2705.

(continued on page 4)

Badminton News

Each year from September until April, the Badminton Club runs a ladder tournament for both singles and doubles. Last year's doubles winners were Y.Y. Chu, Chemistry, first, and Jack Detweiler, Reactor, second. Om Singh, National Synchrotron Light Source, was on top of the singles ladder and See Meng Wong, Nuclear Energy, was second.

This year's official season begins Monday, September 24. Sign-up sheets for reserving courts at 11 a.m., noon and 1 p.m. are found on the Badminton bulletin board in the gym. Newcomers are welcome, but please register with Bill Love, Physics, Bldg. 510, Ext. 3996, to receive a copy of the official tournament rules.

Bowling

White League

Andy Warkentien had a 232, Ken Riker 205, Gerry Riker 191/184.

Purple League

Gail Schuman had a 224, Ed Sperry IV 214, Dennis Klein 206.

Red/Green League

R. Mulderig had a 235/234/638 scratch series, C. Schuster 220, D. Dimino 206, A. Pinelli 202, H. Marshall 200.

Archery Club

The Archery Club is looking for new members to participate in this growing sport. Beginners are welcome, and the club offers free instruction. For information, call Bill Schoenig, Ext. 2377.

Touch Football

As the softball season comes to an end, it's time to think about football. BERA supports a touch football league that will begin soon. It's a competitive league with limited contact and lots of fun. For information, call Wayne Rambo, Ext. 2284, or Fran Loeb, Ext. 2092.

Islander Tickets

Tickets for New York Islander preseason home games are on sale now, at the BERA Sales Office in Berkner Hall. There will be four preseason games — the first tonight, September 14, against Boston.

Tickets for regular season home games will go on sale Tuesday, October 2, at 8 a.m. in the BERA Sales Office. You can look at a complete schedule there now — it will be published in a future issue of the Bulletin.

Trip Canceled To Atlantic City

The bus trip scheduled for Saturday, September 15, to Resorts Hotel & Casino in Atlantic City has been canceled. Pick up refunds at the BERA Sales Office in Berkner Hall, from 9 a.m. to 5 p.m., weekdays.

The next, and probably the last trip for 1990 is scheduled for Saturday, November 10. More information regarding that trip will be published in a future issue of the Bulletin.

BROOKHAVEN BULLETIN

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

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MARSHA BELFORD, Assistant Editor
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79 TOYOTA CELICA GT - 5-spd., 2-dr. h/b, 130k mi., no rust, runs well, \$600. Hsing, Ext. 2958.

78 FORD PINTO - 108k mi., m/t, am/fm cass., new brakes, clutch, exhaust, runs well, needs a thermostat, make offer. Ext. 4940 or 929-3464.

78 PORSCHE 924 - 33.7k orig. mi., new brakes, battery, exhaust, mint cond., must be seen, \$6,000. Bob, Ext. 4970.

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

89 HYUNDAI - for rent, ac, sunroof, etc., \$200 mo.; '82 Plymouth Champ, 2/4wd, 130k mi., good cond., \$1,000. Ernesto, Ext. 3869.

88 DODGE CARAVAN - SE model, 40k mi., silver/gray, dealer maintained, many extras, excel. cond., \$11,500. 654-2533, 6-8 p.m.

88 DODGE DAYTONA - 4-cyl., 2.5L, 28k mi., mint cond., \$7,000 firm. Gene, 472-2658 eves.

88 FORD ESCORT WAGON LX - p/s, p/b, ac, am/fm stereo, 22k mi., ask. \$5,800. Bonnie, Ext. 2875.

88 PONTIAC LEMANS - 4-dr., 42k mi., m/t, 35-40 mpg, 6 yr./60k mi. warranty, \$5,600. Bernard, Ext. 2694 or 345-3579.

87 NISSAN MAXIMA - ac, stereo, sunroof, low mileage, \$10,250. Ext. 2475 or 751-4539.

87 JAYCO MOTOR HOME - 25', 17k mi., ac, generator, cruise, rear bath, like new cond., asking \$28,000. Lois, Ext. 4904 or Bob, 929-4753.

87 TOYOTA PICKUP - 5-spd., new tires, visor, sunroof, graphics, 35k mi., asking \$7,900. Beth, Ext. 4120.

86 SUBARU GL WAGON - like new, 32k mi., all power, options, ac, 5-spd., asking \$5,800. Mike, Ext. 3755.

86 CHRYSLER FIFTH AVENUE - silver, 68k mi., new tires, all power, ac, extras, electric sunroof, \$6,500. John, 878-4414.

86 TOYOTA MR2 - 73.5k mi., 5-spd., power pkg., sunroof, ac, Sony am/fm cass., great performer, \$6,500. Diana, Ext. 3379.

86 MITSUBISHI TRADIA L - 4-dr., ac, am/fm cass., 51k mi., mint cond., \$5,700. Jim, Ext. 2183 or 689-8284.

86 SUBARU GL - 2-dr., h/b, am/fm cass., power pkg., sunroof, 23k mi., excel. cond., \$6,295. Devinder, Ext. 4985.

85 BRONCO - black, 351 H/O, p/s, a/t, ac, push bar, running boards, overhead console, CB, radar, \$8,300. Pete, Ext. 4819 or 289-7218.

85 MERCURY COUGAR - 55k mi., 6-cyl., a/t, ac, am/fm cass., extended warr., car phone, excel. cond., \$4,750. 472-0392 morn. or 472-6922 eves.

85 BUICK RIVIERA - leather interior, ac, loaded, \$5,000 neg. Ext. 4988 or 728-5647.

84 FORD CROWN VICTORIA - high mileage, excel. cond., \$1,800. 286-3357.

84 NISSAN STANZA - 104k mi., a/t, am/fm, excel. cond., \$2,000 avail. from 9/29. Tokio, Ext. 7837.

84 MERCURY GRAND MARQUIS - 8-cyl., full power, am/fm stereo cass., fully maintained, \$4,300. Ext. 2384.

84 DODGE ARIES - gold, a/t, p/s, p/b, ac, am/fm radio, 4-dr., 47k mi., asking \$2,100. Les, Ext. 2920.

83 NISSAN SENTRA - h/b, 4-dr., 5-spd., ac, p/s, p/b, am/fm, body in & out v.g. cond., \$800. Chris, Ext. 3723 or 3200 eves.

83 DATSUN 280Z - turbo, 5-spd., low mileage, good cond. 744-3203.

82 DODGE ARIES WAGON - a/t, good cond., \$875. Ext. 2475 or 751-4539.

82 SUBARU WAGON - 4wd, \$1,400. Ext. 7130 or 929-8323.

81 HONDA ACCORD - 5-spd., 4-dr., am/fm cass., high mi., dealer maintained, runs well, \$800. Lap, Ext. 2336 or 673-0688.

80 DODGE COLT RS - 4-spd., h/b, ac, am/fm, engine n.g., body excel., good for parts, \$75. Ext. 4247 or 331-3766.

80 GMC PICKUP - short bed, 6-cyl., 3-spd., v.g. cond., \$2,695. Ext. 7686 or 874-2789.

80 PONTIAC LEMANS - V-6, a/t, ac, new battery, brakes, tires, timing chain, runs well, looks great, \$1,200. 924-8213.

79 HONDA CX - 500cc, shaft drive, water cooled, shoe bags, sissy bar, runs well, \$495. Frank D., Ext. 2022 or 399-4480.

79 COLEMAN CAMPER - Brandywine Ltd., sleeps 6, stove, heater, sink, porta-potty, new roof & tires, \$1,750. Chris or Tim, 744-1789 after 5 p.m.

79 JEEP CHEROKEE - 360, V-8, a/t, ac, 4wd, class III hitch, \$1,150. John, Ext. 3302 or 924-0651.

79 BUICK REGAL - p/b, p/b, ac, am/fm, new trans., runs well, \$800. Eva, Ext. 4757 or 269-6543.

78 TRAILER - 5'x10', good cond., \$200 or best offer. Ray, Ext. 4407 or 325-2145.

78 MERCEDES BENZ - '86 engine, a/t, p/s, am/fm radio, etc., EPA up to 30 mpg, excel. int., some rust ext., very reliable, \$2,000. Jee, Ext. 5477.

78 FORD VAN - runs, needs work, many good parts, \$550. 878-1178.

78 T-BIRD - gray, 302 V-8 rebuilt engine, trans., no dents, no rust, runs well, \$1,500. Bill, Ext. 4312.

77 PLYMOUTH VOLARE WAGON - a/t, \$200. Hans, Ext. 2624.

76 DATSUN B-210 - runs, good for parts, many new parts, \$100. Al, Ext. 2175 or 231-4613 after 5 p.m.

75 FIAT SPYDER - conv., red, runs, needs body work, \$150. Rollaway Snap-On LG, w/large-size automotive tools, etc., make offer. Bill, Ext. 4312.

73 MERCEDES BENZ - Ext. 3563.

58 PONTIAC SAFARI WAGON - V-8, a/t, 66k orig. mi., drive anywhere, \$3,300 neg. Frank D., Ext. 2022 or 399-4480.

50 DESOTO - sedan, restored, licensed, v.g. cond., \$2,500; 4 tires, almost new, 14" from '89 Jeep Wrangler, \$100. 732-2236.

CAP - for small pickup, cost \$1,500 new, will sell very reasonable, like new. Lou, 732-7090.

HONDA SILVERWING - full fairing, stereo, air suspension, shaft drive, saddle bags, \$900 or best offer. 287-3526

ENGINE - 440 cu. in., \$200. Bierner, Ext. 2543.

TERRY TRAVEL TRAILER - 19'6", sleeps 6, fully self-contained, extras, \$1,950. John, Ext. 3302 or 924-0651.

TIRES - 3, Grand Am radial GTs, P275/60/SR15 w/Cragar center lines, good cond., was in accident, taking up space, \$100. Darren, 325-0563.

BATTERY - top-post, \$10; extra-long heavy-duty battery cables, \$15. 689-9234.

TIRES - 2, Yokohama 185/70-14, less than 1k mi., \$25 ea.; 2 Ford Club wagon bench seats, \$25 ea. 689-1539.

TRUCK RACKS - maple hardwood, bolted, \$50; tires, 2, P235/75/R15, \$5 ea. Tim, 744-8279.

Boats & Marine Supplies

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

8' DINGHY - 1990, fiberglass, Dawn, 758-3830.

25' SEIDELMAN SLOOP, cruising equipped, ib. diesel, VHF, D.S., 3 sails, steel cradle, excel. cond., \$12,000. Jim, Ext. 4584.

22' CATALINA SAILBOAT - 3 sails, motor, trailer, asking \$3,999. Steele, Ext. 3496 or 929-8912.

20' FIBRE - i/o, Volvo Penta Ford, not in boat, \$600. Ken, 395-6235.

19' CHRIS CRAFT - Gator tilt trailer, 60-h.p. Evin., elec. winch, v.g. cond., \$2,200. Bill, Ext. 3859.

16' GLASPAR RUNABOUT - Cox trailer, 25-h.p. Johnson ob., 100 lb. mooring, \$700 takes all. Roy, Ext. 4600.

14' DORY ROWBOAT - sturdy, fiberglass, 10-h.p. Honda ob., accessories, trailer, excel. cond., \$1,400. 287-3526.

SUNFISH - original model but in excel. cond., daggerboard, trailer incl. Don, Ext. 3625.

KAYAK - fold boat, 2 seater w/paddles, \$200. Bill, 286-7583.

ENGINE - Chevy V-8 283 c.i., marine, 180- h.p. w/Borg-Warner trans., low hrs., spare manifolds, excel. cond., \$600 neg. Bill, Ext. 4312.

ENGINE - Chrysler 318, standard ignition, on-board spare parts kit, in box, \$20. Bill, Ext. 7136.

Furnishings & Appliances

DRYER - GE, electric, 220 volt, used 1 mo., white, excel. cond., \$200. Leo, Ext. 2952.

BED - twin, 2 pieces w/frame, 1 yr. old, \$28. Joe, Ext. 5477.

BED - double, frame, boxspring, mattress, 1 yr. old; rattan chairs & corner table; dryer, apt. size, 110 volts, \$25. Dave, Ext. 5460.

CHAIR - wingback, \$75; china cabinet, \$125. Walter, Ext. 4958 or 821-9451.

CEILING FAN - white, 56" dia., 10" down rod, \$20. 472-3254.

DINING ROOM SET - oak, buffet, base, 2 arm chairs, lighted hutch, 72"x42", w/pads, mint, \$1,995. 266-5591.

DINING ROOM TABLE - early Amer., 48" round table, 2 leaves, w/4 chairs, \$200; hamper, 24", \$25; chess table, pedestal, 23"x23", \$50. 654-2617.

DISHWASHER - portable, wood top, excel., \$100; kerosene heater, new, \$50; dinette table, 4 Bruer chairs, \$150; a/c, \$150. J. Grogan, Ext. 3254.

HUTCH - china top, w/buffet, 56" w x 76" h, Hawoud Wakefield, light brown color, \$200. Bill, Ext. 7136.

KITCHEN UNIT - Pullman, 4 cu. ft. refrig., 2-burner stove top & sink, 29"x25"x37", stainless top & sink, good cond., \$250. Alice, Ext. 3293.

REFRIGERATOR - GE, 20 cu. ft., top freezer, self-defrosting, harvest gold, clean, works well, \$75. 736-3384 after 6 p.m.

REFRIGERATOR - GE, no frost, avocado, 15.6 cu. ft., good cond., \$125. 654-5479.

SCHOOL DESK - children's, early American, \$25; sewing base, Singer, wrought iron, \$20. 281-8274.

SOFAS - 2, good cond., \$75/pair; hatch cover table, \$100. Donna, 722-3338.

WALL UNIT - rattan, w/desk, 3 drawers, 7 shelves, 6'h x 7'1 x 17"d, \$150. 654-5479.

WASHING MACHINE - & dryer, 2 yrs. old, excel. cond., asking \$160. Tokio, Ext. 7837.

WATER BED - single, framing & hardware, w/heating element, v.g. cond., \$100. Tirre, Ext. 3288 or 281-0360 after 6 p.m.

Tools, House & Garden

SINK - & toilet, both yellow, v.g. cond. 878-6074 eves.

TOOLS - machinist's, new & used, large variety, reas.; maple desk, \$15; queen-size bed, brass-plated, new, \$25. 878-6637.

ENGINE REMOVAL STAND - 14' high, wood, on wheels, \$75 or best offer. Bill, Ext. 4312.

LAWN MOWERS - 3 1/2 h.p., Briggs, 20", \$65; Wheelhorse lawn tractor, Kohner 10 h.p. engine, 4' plow, \$1,500 firm. Dan, Ext. 4987 or 698-7322.

TOPSOIL - fine, screened, 3-yard minimum delivered. 696-6011, leave message.

Sports, Hobbies & Pets

BICYCLE - boy's, 20", good cond., \$30. Paul, 727-4859.

BICYCLE - 10-spd., Raleigh Gran Prix, 25 1/2", blue, kickstand, fenders, toe clips, rack, Avocet touring saddle, cyclometer, handlebar bag, \$90. 744-0892.

SKIS - Hurt, 170 cm, new bindings, recently tuned, excel., \$70; man's ski boots, size 9 1/2, \$35. 724-7758.

SKIS - 3 Season Young Olin 771, 160 cm, w/Marker M36 twin cam bindings, good cond., \$100. Sharon, Ext. 7140.

TREE STAND - & hand climber, Baker, used 4 times, orig. \$110, sell for \$45/both. Hank, Ext. 7828.

ROTTWEILERS - AKC, champion breed, due early Sept., will hold for Xmas. Chris, 654-1146.

BICYCLE - girl's, 20", asking \$10. Tokio, Ext. 7837.

COCKATIELS - 3, gray & yellow, healthy, active, large round coppertone cage, stand, mint cond. Thomas Kelly, Ext. 3696 or 744-3069

SURF BOARD - 6'2", BZ, foam, like boogie board, tri-fin, asking \$50; plastic weights, three 15-lbs., bar, curl bar, 2 bars, \$75. Darren, 325-0563.

VIOLIN - 1/2 size, Suzuki, good tone, \$80. Peter, Ext. 7687 or 744-1112.

TV - RCA, color, 14", \$90; monitor, like new, \$40; portable stereo w/2 cassette players, high speed dubbing, \$120. Chris, Ext. 3723 or 3200.

TYPEWRITER - Brother, electronic, \$38. Joe, Ext. 5477.

COLOR TV - 10", \$100; 10" b&w TV, \$25. Walter, Ext. 4958 or 821-9451.

COMPUTER - Kaypro II w/various software, CCS-S100, w/misc. memory, I/O cards, Adam computer, spare tape drive, make offers. Bill, Ext. 4312.

HOME ENTERTAINMENT CENTER - \$60; am/fm cass. clock radio, \$20; wood table floor lamp, \$50; 2 high wood stools, \$10. Anne, 345-3579.

PLOTTER - Hewlett Packard, color, plain, paper, brand-new, \$800. Ext. 7699 or 821-1138.

SPEAKERS - Dahquest 10A, excel. sound quality, \$500. Joe, 698-8623, leave message.

STEREO AMPLIFIER - Hitachi HA4500, 60W, v.g. cond., \$40. Tony, Ext. 5508.

STEREO CASSETTE PLAYER - solid state Soundesign, \$25. 472-3254.

TAPE DECK - Teac, 10 1/2", reel-to-reel, 3 head, excel. cond., \$125; Kodak Retina 111C 35mm camera, excel. cond., \$100. I. Meyer, Ext. 4309.

Miscellaneous

BABY'S ITEMS - playpen, \$10; bath trainer, \$5; finishing sander, \$25; jigsaw, \$20. Anne, 345-3579.

CRAFT BOOKS - cross stitch, embroidery, knitting, Christmas, many more, \$10/each. Christine, Ext. 4120.

FISH LIQUER BOTTLE - \$20; air conditioner, \$30; floor lamp, \$20; weed wacker, \$20; patio umbrella, \$20. Tim, 744-2203.

GIRL SCOUT UNIFORMS - size 10 pants, size 12 blouse, cap, worn twice, best offer. 399-0039.

STROLLER - Cosmos w/carriage feature, good cond., \$30. Ext. 4985 or 331-8459.

TICKETS - 2, Ridge Quartet, Islip Chamber Music Series. Sept. 22. \$25/both. Ext. 2041.

Free

CAT - 1-yr.-old, long-hair female tabby, spayed, charcoal & light gray w/white paws, affectionate. 281-2002.

KITTENS - adorable, black or gray, litter-box trained, good w/dogs. Maggie, Ext. 3275 or 924-6681 after 6 p.m.

Yard & Garage Sales

EAST NORTHPORT - moving sale, Sept. 15, 7 Carrington Dr. 266-5591.

HOLBROOK - exercise equip., clothes, books, toys & misc., Sat., Sept. 15, 9-4 p.m., 269 Thunder Road, off Greenbelt Pkwy. 472-4087.

PATCHOGUE - Sat., Sept. 15 & Sun., Sept. 16, 10-4 p.m., 221 Jayne Ave.

SHOREHAM - multi-family, Sat.-Sun., Sept., 15-16, 10-5 p.m., 55 Highland Down.

Car Pools

CORAM-GREENBROOK - need ride to and from Brookhaven for month of October, will share expenses. Maryann, Ext. 4909.

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

BELLPORT - 1-bdrm. apt., priv. ent., suitable for single, no pets, \$550/mo. Khem, Ext. 3667.

BELLPORT VILLAGE SOUTH - 3 bdrm., 2 baths, furn., nonsmoker, no pets, near bay, Sept.-June occupancy, \$900/mo. + util. 286-0466 or 286-9389.

CALVERTON - 2-bdrm. townhouse, patio, deck, appliances. Henry, Ext. 3550.

CENTER MORICHES - 2-bdrm. apt., new rugs & appl., \$650/mo. + util. George, 878-1178.

CORAM - single or couple, 7-room ranch, 15 min. to Lab, \$600/mo. + util., short term only. 928-7154 after 7 p.m.

CORAM - large 1-bdrm. apt. in complex, tennis, pool, clubhouse, a/c, \$700/mo. includes heat and water. Joe, 698-8623, leave message.

FARMINGVILLE - l/r-bdrm. combo, full kitchen, priv. ent. & drive, furn., cable, 10 min. from Lab, \$550/pays all. Ext. 3160 or 289-5704 after 5 p.m.

HOLBROOK - 1-bdrm. house, fee & util. neg., avail. mid-Sept., no pets; also 1-bdrm. apt., furn. or unfurn., no pets, fee neg., most util. incl., avail. Sept. Fred, Ext. 7947 or 588-2268.

MATTITUCK - 2-bdrm. ranch, d/r, l/r, bsmt., w/d, gar., Fla. room, \$900/mo. + util. & sec. Dave, Ext. 5460.

MATTITUCK - 1-bdrm. apt., quiet wooded area, near water, full bath, l/r & closets, kitchenette, priv. ent., nonsmoker, reasonable rent. 298-9560.

MEDFORD - 1-bdrm. apt., l/r-kitchen combo, priv. ent., cable, close to all, nonsmoker, single person preferred, \$550/mo. pays all. Phil, 758-9408.

MIDDLE ISLAND - furnished room, full bath, priv. ent., cable, nonsmoker, cooking, 2 mo. sec., \$115/wk. B. Duffus, 924-5533, after 4:30, M-T after 3 p.m.

MIDDLE ISLAND - 3-bdrm. condo, 2 full baths, a/c, fenced patio, pool, tennis, 6 min. to BNL, \$104,900, sale or \$950/mo. rent. Ext. 3922.

N. SHIRLEY - furn. apt., bdrm. & l/r combo, eik, w/w, skylight, priv. ent., nonsmoker, no pets, \$500/mo. util. incl., sec. 281-8044.

PORT JEFF. VILLAGE - 2-bdrm. ranch, bsmt., 1 1/2 car gar., all appl., gas heat, walk to harbor, quiet street, avail. immed., \$900/mo. + util. Ext. 4094, 751-6575 eves.

RIDGE - furn. studio apt., w/w, kitchen, bath, priv. ent. & yard, 5 min. from Lab., nonsmoker, \$490/mo. incl. all. 744-8632.

RIDGE - 1-bdrm. apt., kit., full bath, l/r, w/w, cable TV, mature working person, 5 min. to Lab, \$575/mo. incl. all, 1 mo. sec. Mike, Ext. 7625.

ROCKY POINT - 3 bdrm., eik, laundry, fenced yard, new carpet, paint, \$800/mo., avail. Oct. 1. 473-6570 after 7 p.m.

SHIRLEY - furn. room in new house, quiet, view of woods from sliding doors, priv. balcony, fan, carpeting, refs. \$100/wk. 399-1868.

SOUND BEACH - 2 bdrm., eik, bath, carpet, hard wood floors, fenced-in yard, bsmt., laundry, quiet neighborhood, avail. Nov. 1, \$700/mo. Don or Sue, 473-6570 after 7 p.m.

SOUND BEACH - 2-bdrm. ranch, bath, l/r, d/r, eik, bsmt., w/d, Miller Place SD, 11 mi. to Lab, avail. Sept. 10, \$850/mo. + util. & sec. 821-4553.

WADING RIVER - 3-room apt., eik, full bath, one person, no pets, nonsmoker, \$500/mo. incl. all. Janet, Ext. 2345 or 929-3910.

WADING RIVER - 1-bdrm. apt., kitchen-l/r combo, bath, w/w, cac, cable, priv. ent. & deck, no pets, no smokers, \$600/mo. incl. all, avail. Oct. 15. Ruth Ann, Ext. 7774 or 929-6235.

BOQUERON, PUERTO RICO - 2-bdrm. condo, \$300/wk., \$700/mo. 473-6570 after 7 p.m.

For Sale

BELLPORT VILLAGE - also for rent, 2 bdrm. + sleep loft, 2 baths, French doors/windows, skylights, 3 decks, hot tub, \$265,000 or rent \$1,200/mo. + util. Susan, Ext. 2888 or 286-0422.

BROOKHAVEN HAMLET - circa 1738, 2-bdrm. cottage, wide planked floors, hand-hewn beams, keeping rm. w/fp, greenhouse off kitchen, 2 baths, \$225,000. Susan, Ext. 2888 or 286-0422.

BROOKHAVEN HAMLET - 4-bdrm. Cape Cod, 2 baths, d/r, l/r, eik, 2-car gar., 20' deck, patio, more, close to bay, 3/4 acre, red. to \$219,000. Ext. 7108 or 286-0