BROOKHAVEN BULLETIN

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BROOKHAVEN NATIONAL LABORATORY

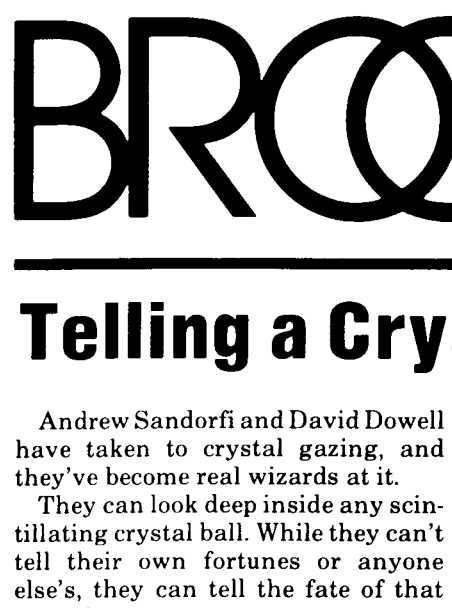
Telling a Crystal's Fortune

Andrew Sandorfi and David Dowell have taken to crystal gazing, and they've become real wizards at it.

They can look deep inside any scintillating crystal ball. While they can't tell their own fortunes or anyone else's, they can tell the fate of that crystal.

Dowell and Sandorfi do not have a sixth sense about crystal balls, or, for that matter, about any crystals that emit light when radiation passes through them. Sandorfi, a Physicist, and Dowell, a former Associate Physicist, Physics Department, have developed the first method and equipment to scan the intensities of scintillating crystals.

"We now can tell which regions of a crystal differ in their scintillation properties — if they give off different amounts of light for the same amount of energy deposited," says Sandorfi.



A graph of the resolution of an NaI(Tl) crystal, demonstrating the correlation between the predicted resolution and experimental results. The solid line represents the crystal's resolution obtained experimentally by shining 20-million-electron-volt gamma rays into the NaI(Tl) detector. The jagged line is the predicted resolution, based on the muon scan.

The scan tells them how uniformly a crystal emits light when it scintillates. Until now, "Crystal growers had no idea what the uniformity of their crystals were," explains Sandorfi. "All they could say was that the resolution was good or bad — they didn't know how bad or where it went bad within the crystal."

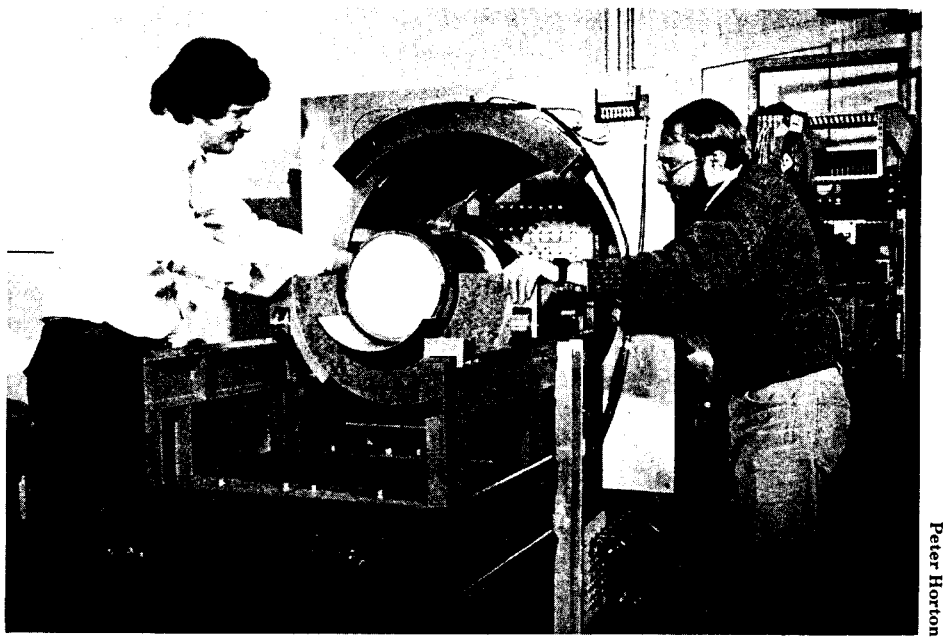
Using this scan, Dowell and Sandorfi can now accurately predict how well a thallium-activated, sodium iodide [NaI(Tl)] crystal detector will be able to resolve two gamma rays of similar energies. This is the first time researchers have succeeded in making such predictions, and it has come about because of Sandorfi and Dowell's crystal-gazing technique.

An evenly scintillating, high resolution ingot of NaI(Tl), 19 inches in length and diameter, has a future as part of a detector for the Laser Electron Gamma Ray Source (LEGS). LEGS is being developed as a medium energy, nuclear physics facility on the x-ray ring of the National Synchrotron Light Source. It will provide intense monochromatic and polarized gamma rays with energies up to 500 million electron volts.

If such a large crystal scintillates non-uniformly, then it is doomed: It will be cut up into smaller crystals by the crystal grower. The crystal-growing company Sandorfi and Dowell have worked with in developing their technique is Bicron Corporation, Newbury, Ohio.

Bicron is one of three companies in the world that produce large ingots of NaI(Tl). Such crystals are grown by melting mixtures of ultra-pure sodium iodide and thallium iodide in giant platinum crucibles, which are cooled slowly as the crystals form.

After being grown, crystals of various sizes are used for "oil logging," or inspecting the holes drilled during oil exploration; computer-aided tomographic (CAT) scanners; and a variety of other applications. The larger crystals are utilized in physics experiments, like the LEGS detector. It will contain the largest single crystal of NaI(Tl) ever made.



Peter Horton

Andrew Sandorfi (left) and David Dowell loading a ten-inch NaI(Tl) crystal (center), used for the first test of their crystal-scanning technique, into the muon scanning array.

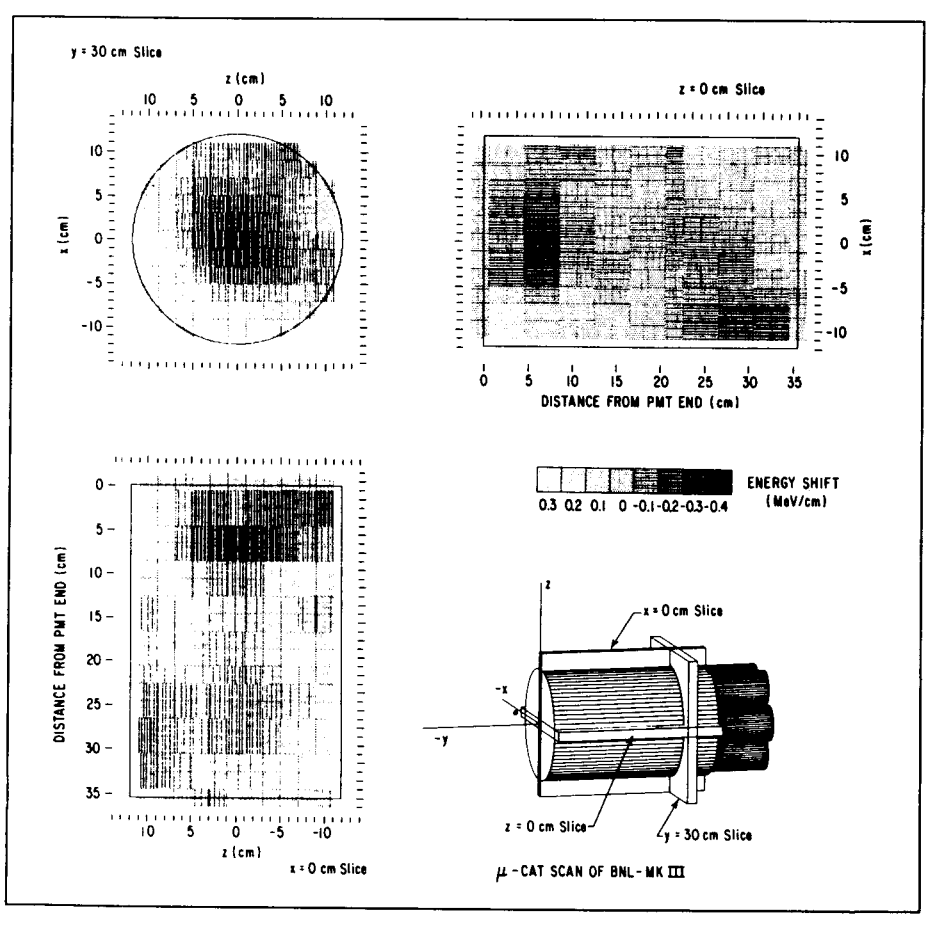
The crystal scanning technique was developed as part of the U.S. Department of Energy's (DOE) Technology Exchange Research Program, which was begun in 1985. The DOE program is funded by its Office of Energy Research and is intended to promote the transfer of technology from the national laboratories to industry.

Dowell and Sandorfi's crystal-gazing scanner works much like a medical CAT scanner. A CAT scanner uses a gamma ray source: The gamma rays pass through the body, and their intensities are detected on the other side. This measurement is made along many different lines, and a three-dimensional picture of the body is created as a result.

The scan reflects the differences in density within the body. Because they are denser than normal body tissues, tumors within the body will absorb more gamma rays, and hence appear as dark spots on a CAT scan.

Sandorfi and Dowell are looking for such dark, as well as light spots, in scans taken of crystals. However, in scanning scintillating crystals, they

(Continued on page 3)



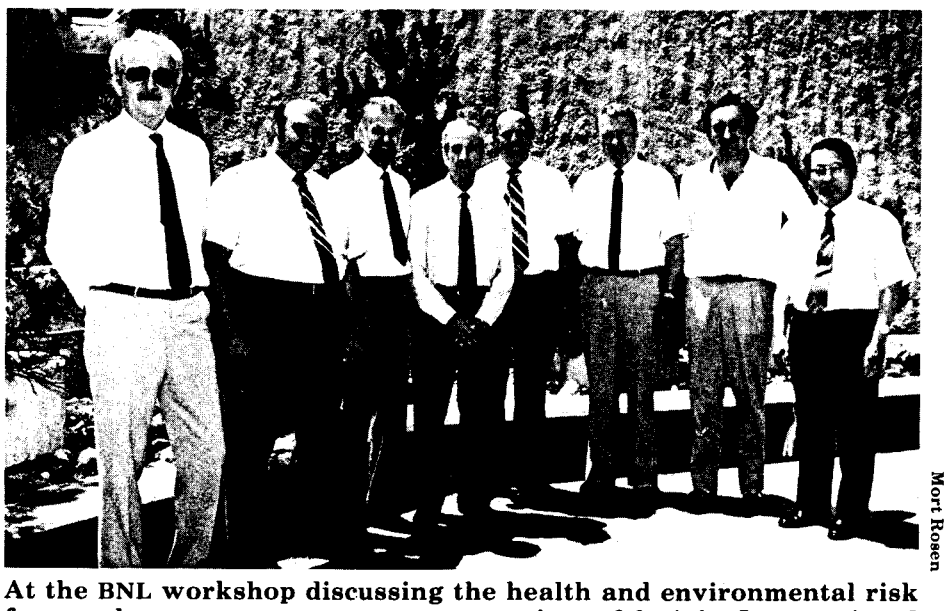
Three slices from the muon scan of a ten-inch NaI(Tl) crystal. The black area indicates a flaw in the crystal. The flawed region of the crystal scintillates less than the rest for the same amount of energy deposited, thus decreasing the crystal's resolution. The three slices were taken from the crystal as shown in the model at bottom right.

Averting Global Pollution Problems

Over 30 participants from 15 countries all over the world, including Brazil, Czechoslovakia, Mexico and Yugoslavia, gathered at BNL from June 29 to July 2, to discuss collecting information from various nations on emissions that pollute air, water, soil and food, and the pollution's effects on people.

The occasion was a workshop on "Assessing and Managing Health and Environmental Risks from Energy and Other Complex Industrial Systems," organized and chaired at Brookhaven by Leonard Hamilton, Department of Applied Science, Director of the World Health Organisation Collaborating Centre for the Assessment of Health and Environmental Effects of Energy Systems.

Information on emissions — their transport, transformation and dose-response relationships — is already available in countries such as the U.S. However, a group of several concerned international agencies is preparing world-wide emissions data, along with guidelines on how to aquire and use these data to avert pollution effects. As discussed in the workshop, this is expected to be a key step in preventing national and global pollution, and of particular assistance to developing nations.



Mort Rosen

At the BNL workshop discussing the health and environmental risk from such sources as energy, representatives of the joint International Atomic Energy Agency (IAEA)/United Nations Environment Programme (UNEP)/World Health Organization (WHO) Project were joined by member countries of the International Energy Agency (IEA) Programme of Energy Technology Systems Analysis, Annex III, who had just attended the International Forum for Energy Environment Studies held at BNL from June 24 to July 1. Pictured (from left) are Sam Ozolins, (WHO); Alfred Galli, Environmental Protection Agency; John Hollins, Environment Canada; Leonard Hamilton, BNL's Department of Applied Science (DAS) and WHO Coordinator; Ephraim Asculai, IAEA; Douglas Hill, DAS, chairman of the earlier IEA meeting; Janos Pasztor, UNEP; and Shigeru Yasukawa, Japan Atomic Energy Research Institute.

Those Nice Round Life Numbers: 18,500

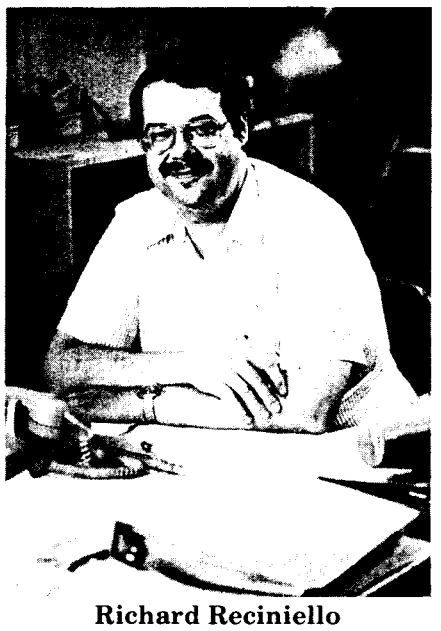
This is the first appearance of a column welcoming new employees who have been issued nice round BNL life numbers — those divisible by 100.

For 40 years, every new employee has been issued an identification number by Personnel Records. "We started from 100 and assigned them as fast as people were hired," recalls retiree Alice Mabry, BNL life number 193, who started on March 17, 1947, in Personnel Records, and went on to become its Supervisor before her retirement in 1977. "I don't remember how that number came to be called a life number, but once it is assigned to you, it is yours for life: If you terminate and are rehired, you get your old life number back."

In coming to work at the Lab on June 29, Richard Reciniello, BNL life number 18,500, "came back to the work I've done before and enjoy the most: environmental monitoring." He is a Project Engineer in the Safety & Environmental Protection Division.

As such, Reciniello is S&EP's representative to the Department of Applied Science and the Department of Nuclear Energy. Working out of the Hot Lab, Bldg. 801, he monitors radiation safety and industrial hygiene for those two departments.

After being graduated from college, "I worked for the U.S. Department of Energy, as a radiochemist at its Health and Safety Lab in New York City for eight years," says Reciniello, who took his B.S. in Chemistry from Wagner College in 1972 and received his M.S. in Applied Science from New York University in 1981. In his first position, he monitored environmental samples from all over the world for radiation.



Mort Rosen

Richard Reciniello

After a one year stint, 1981-2, with a private environmental monitoring company, Reciniello became a research chemist with a polymer manufacturer in New Jersey before coming to BNL. "I enjoy monitoring work more than bench chemistry," says Reciniello, "because I feel that I am performing a necessary function that is beneficial, instead of producing just for profit."

Reciniello moved from Swarthmore, Pennsylvania, and is living with his sister in New Hyde Park. Says Reciniello, "I grew up there, so it is like coming back home, but it is too much of a hike. I'm looking for a place within a half-hour commute of the Lab." As he settles in, Reciniello is looking to partake in various Lab activities, such as an informal, lunchtime darts club and, next year, the Brookhaven Employees Recreation Association softball league.

— Marsha Belford

BNL's Fabulous Forty

While this is Brookhaven's 40th anniversary year, it is also the 41st anniversary of the founding of the organization that founded BNL and continues to oversee the Laboratory: Associated Universities, Inc. (AUI). And, as July is the month in which AUI was twice incorporated — first in New Jersey and then in New York —it might best be considered AUI's anniversary month.

AUI evolved out of a common desire among many institutions in the Northeast for a nuclear science research center located in this section of the country. How this desire became a reality is described in two interesting documents: *The Founding of the Brookhaven National Laboratory by Associated Universities, Inc.*, a final report of work by Columbia University under government contracts, January 15, 1948, and *Early History of Associated Universities and Brookhaven National Laboratory* by Norman F. Ramsey (Brookhaven Lecture No. 55, March 10, 1966).

The Columbia report explains why a laboratory was needed. "At the end of the war it became apparent that the teamwork of government and scientific insitutions, which had been so effective in wartime work, must somehow be perpetuated in order to insure the continued progress of nuclear science in peace time." While the needs of World War II had already activated nuclear science research centers in Berkeley, Los Alamos, Oak Ridge and Chicago, none had been developed in the Northeast. Since, the report says, ". . . so much of the nation's scientific talent and industrial activities are concentrated in the northeastern states, it was proposed that a new laboratory be established near New York City."

With this in mind, on January 16, 1946, George B. Pegram, Dean of the Graduate School of Columbia University, called a meeting, which, states the report, "... was attended by representatives from [21] leading research insitutions in the New York area. At this meeting a letter was drafted to Major General Leslie R. Groves, Commanding General of the Manhattan District, stating the need for such a laboratory and offering the assistance of these institutions in taking the steps necessary to achieve it."

As events proceeded, some institutions withdrew. Ramsey's report describes how those remaining were joined by the "opposition" — scientists from the Cambridge, Massachusetts area who had wanted the laboratory near them. When Groves indicated there could be only one laboratory, the opposing groups agreed to work together. Their agreement was formalized on March 23, 1946, with the unanimous approval of a resolution:

> That Columbia University, Cornell University, Harvard University, The Johns Hopkins University, Massachusetts Institute of Technology, University of Pennsylvania, Princeton University, University of Rochester, and Yale University, being interested in promoting and establishing in the northeast region of the country a government research laboratory for nuclear science and in cooperating with other institutions of this region in the operation of such a laboratory, do now join for the furtherance of these interests in an association through representatives duly authorized by the heads of these universities, to be known as the Initiatory University Group.

The University of the State of New York
Education Department

Absolute charter of

Associated Universities, Inc.

This instrument witnesseth: That the Board of Regents for and on behalf of the Education Department of the State of New York has granted this absolute charter incorporating George A. Beckley, George B. Pegram, I. I. Rabi, H. D. Smyth and W. W. Watson and their associates and successors as an educational corporation under the corporate name of Associated Universities, Inc., to be located in the State of New York, upon property of the United States Government.

The purposes for which the corporation is formed are:

1. To acquire, plan, construct and operate laboratories and other facilities, either under contract with the Government of the United States or its agencies or otherwise, for research, development and education in the physical and biological sciences, including all aspects of the field of nuclear energy and its engineering and other applications, and to educate and train technical, research and student personnel;
2. To establish an agency through which universities and other research organizations will be enabled to cooperate with one another, with the Government of the United States and with other organizations toward the support and use of laboratories and other research facilities and toward the development of scientific knowledge in the fields hereinabove set forth;
3. To accept and collect pledges, donations and contributions from participating universities and others toward the construction, maintenance and operation of the foregoing laboratories and facilities or of all services incident thereto.

The persons named as incorporators shall constitute the first board of trustees, to hold until their successors shall be chosen by the surviving trustees with power in the board to fill vacancies, to adopt bylaws and, from time to time, by unanimous vote, to fix the terms of office of said trustees and their number, to be not more than 25 nor less than five.

The corporation hereby created shall be a nonstock corporation organized and operated exclusively for educational and research purposes and no part of its earnings or net income shall inure to the benefit of any individual; and no officer, member or employee of the corporation shall receive or be entitled to receive any pecuniary profit from the operations thereof, except reasonable compensation for services.

The principal office of the corporation is to be located at Columbia University, in the city, county and State of New York.

Granted July 18, 1946 by the Board of Regents for and on behalf of the State Education Department, executed under the seal of said Department and recorded therein Number 5249

William J. Wallin
Chancellor

President of the University and Commissioner of Education

The absolute charter granted Associated Universities, Inc., by the New York State Board of Regents on July 18, 1946.

As Ramsey points out, "The Initiatory University Group was often called by the letters IUG for short — fortunately it was not pronounced *ugh*."

As Secretary of IUG, Ramsey hired the new organization's first employee, Mariette Kuper, in March 1946. Recalls Ramsey, "The first assignment I gave Mrs. Kuper ... was to figure out how she could possibly be paid." Actually, IUG was operating under an interim arrangement where Columbia University charged some IUG expenses to its existing contract with the Manhattan District. By April 3, a formal supplement was made to that contract for IUG expenses.

By June 1946, plans were afoot to incorporate the group in New Jersey, where it looked as if the laboratory might be located. Since the group would no longer be "initiatory" after incorporation, the search was on for a permanent name. Among the possibilities considered, the report cites:

> "University Institute of Research," . . . "Atlantic University Research," "University of Advanced Research." ... [and] a number of experimental abbreviations, including "Univas, Inc.," "Nures Corp." (*nuclear research*) and "Pyjohmitch Corp." and "Phytch Corp.," formed from the initials for the nine universities. The final decision was made at a meeting of the Committee on Incorporation on June 6, 1946, where "Associated Universities, Inc." was adopted.

This set the stage for AUI's "anniversary month." On July 8, 1946, AUI was incorporated in New Jersey, and the first meeting of the new corporation took place on July 10. As one item of business at this meeting was the passing of a resolution to request Camp Upton on Long Island, New York, as a site for its laboratory, it was also deemed necessary to reincorporate AUI in New York State. This took place with the granting of the absolute charter by the New York State Board of Regents on July 18, 1946 — exactly 41 years ago tomorrow.

Following the granting of the charter, the first meeting of the AUI Board of Trustees as a New York corporation took place on July 30, 1946. At that time, actions taken by the New Jersey corporation were formally repeated, including the request for the Camp Upton site.

— Anita Cohen

DAS Remembers Service Anniversaries

Mort Rosen

On June 19, Bernard Manowitz (back, right), Chairman of the Department of Applied Science (DAS), hosted a reception for DAS members who recently observed BNL anniversaries. These include: (back, from left) Carmen Benkovitz, Joan Congemi, Russell Dietz, Charles Bachsmith, James Hurst, John Andrews and Creighton Wirick; (bottom, from left) George Schidlovsky, Patricia Fox, Neal Carciello, Jack Fontana and Roger McDonald. Missing from the picture are Richard Leigh, James McBreen, Kathy Norden, Meyer Steinberg and Catherine Tierney.

Attention Bowlers

Applications for next season's bowling leagues are now available at the BERA Sales Office located in Berkner Hall. If information is required, contact either Ed Sperry, Ext. 2697; Maria Apelskog, Ext. 3138; Maryann Reynolds, Ext. 5241; or Charlie Bohnenblusch, Ext. 4758.

Crystal (cont'd)

are not interested in mapping differences in density, but differences in the intensity of light produced when radiation passes through the crystal.

"Impurities within a crystal that are too small to detect as density fluctuations can make enormous differences in a crystal's scintillation properties," explains Sandorfi.

So to map differences in light intensity, Dowell and Sandorfi's scanner uses, instead of gamma rays, muons from cosmic rays. Muons are charged elementary particles that do not interact strongly with the crystal as they pass through and that deposit their energy along a defined line in causing the NaI(Tl) crystals to scintillate.

In addition, "Muons are everywhere," explains Sandorfi, "and that is their biggest advantage: The crystals can be scanned at the factory instead of having to be shipped to and from a particle accelerator." At sea level, about 100 high-energy muons pass through a crystal in each second. Data must be collected for about a month for an image to be produced.

To scan a crystal, it is placed between two scintillators that detect muons. When the detectors register simultaneously, a muon has passed through the crystal. The scintillators map 4,096 lines of light resulting from the passage of muons to form a three-dimensional picture of the crystal.

This image is a gray-scale plot that tells Sandorfi and Dowell how the light's intensity differs about the crystal. Dark areas on the plot mean that less light is given off — that a defect or "tumor" exists within. Alfred Baron, a 1986 summer student who has returned to the Lab this summer, and Brian Fineman, another 1986 summer student, assisted with the computer programming to evaluate the data and form the image.

As it turned out, a tumorous defect was found along the center axis of a crystal, ten inches in diameter, on which Dowell and Sandorfi first tested their method. As agreed, just as Bicron is getting a method of gazing into their crystals, Sandorfi will get to pick the most perfect one for LEGS.

By comparing the crystal's scintillation plot to its growth chart, Bicron will be able to identify factors that cause crystals to grow and, hence, to scintillate unevenly. "Before, crystal growers only knew they had grown a poor-quality crystal after the fact," explains Sandorfi. "Now they will be able to control their products' growth better and to produce better crystals." — Marsha Belford

Equipment Demos

David Levy of the Nuclear Data Corporation will demonstrate the Vaxbased System ND 9900 on Thursday, July 23, from 10:30 a.m. to 2 p.m., in the lobby of Berkner Hall.

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The Fluke van, a self-contained, 35-foot motor home converted to a rolling electronics exhibit, will be parked in the Berkner Hall parking lot on Friday, July 24, from 10 a.m. to 3 p.m. Inside, Fluke representatives will give hands-on demonstrations of their latest product offerings, with power provided by two on-board generators.

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Lifesaving Course

A course in advanced lifesaving will be offered at the Laboratory pool to employees and their immediate family members 16 years of age and older. Classes will be held on Monday, Wednesday and Thursday evenings from 9 p.m. to 11 p.m., for four consecutive weeks, starting Monday, July 20.

Enrollment will be limited to a maximum of 20 and a minimum of 10 participants. A $21 fee, payable to BERA, will be due at the time of registration. The fee includes cost of American Red Cross card.

Instructor Keith Wilson may be contacted at the pool, Ext. 3496, for more information.

Golf

The fifth tournament of the BGA season will be held on Thursday, July 30, at the Rock Hill Country Club in Manorville. Tee times will begin at 11 a.m. and may be obtained by contacting Joe Mayeski, Ext. 2575, Bldg. 911A. The deadline for signing up for the tournament is Monday, July 27.

Entry fees will be $1 for BGA members, $2 for non-members. Greens fees of $12 will be collected at the first tee. The tournament will be stroke play with gross and net winners by flight.

In the event of questionable weather, information about the tournament's status will be available from the pro shop at the course, 878-2250. Golfers should report to the starter at the first tee at least twenty minutes before their scheduled tee-off times.

Thirty-four teams competed in the two-person scramble held at the Indian Island Golf Course in Riverhead. Winners were: Flight A - Tom Romano and Rick Murgatroyd (68), Flight B -Don Cassidy and Ron Webster (74), Flight C - Mike Clancy and John Dioguardo (78), Flight D - Joe Fortunato and Kevin Yachnik (82), and Flight E - Bob Chanda and Bob Danowski (90).

T-Shirts Still Available

—photo by Rosen

Sifting through a pile of T-shirts commemorating the Lab's first 40 years are Renée Flack, Affirmative Action Office (AAO), and Richard Jones, a summer student in the AAO. The T-shirts they're looking at are already promised, but you haven't missed your chance yet. Due to popular demand, the blue with white print T-shirts will continue to be available for sale through August 14. Made of 50% cotton and 50% polyester, the T-shirts cost $6 each and come in seven unisex sizes: children's small, medium and large, and adults' small, medium, large and extra large. To place your order, mail or bring cash or a money order payable to "Renee Flack — T-shirts '87" (no personal checks please) to Flack at the AAO, Bldg. 185A, Ext. 3316. Allow two weeks for delivery.

Arrivals & Departures

Arrivals

Barry M. Magee ..... Sfgrds. & Sec.
Daniel M. Wilkins ..... Sfgrds. & Sec.
John T. Yates ..... Sfgrds. & Sec.

Departures

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

Robert B. Aronson ..... Medical
George L. Landahl ..... Plant Eng.
John F. Trager ..... AGS

Softball

Week of June 6

League I
Six Pax 10 - SMF 4
Cool 'n Gang 6 - BNL Bandits 5

League II
Scram 27 - Phase II 6
Cutting Edge 11 - Lights Out 9
AMD 8 - Medical 7
Titans 14 - Dirty Sox 6

League III
Farm Team 14 - Septembers 9
Foul-Ups 9 - Survivors 8
Mole-esters 14 - Source 12

League IV
Sandboxers 12 - Simply Awesome 4
Turkeys 7 - Hit 'n Run 5
Underalls 9 - No Feedback 7

Contests! Contests! Contests!

If you like contests, you'll love the BNL picnic, scheduled for September 19. Right now you can enter the:

Picnic Poster Competition

The Special Events Committee would like more posters to advertise the picnic. Winning entries will be shown in different areas on site. Children's artwork is especially welcome. Please make sure that the date — September 19 — and the words "BNL 40th Anniversary Picnic" appear on the poster. Rosalie Piccione, Bldg. 355, and Betty Pergan, Bldg. 179A, are hoping to see some masterpieces delivered to their offices.

On the posters, you may also see mention of the:

Fun Olympics

Fun Olympics will be crazy team sports for teams of up-to-any-age adults, who should have a lot of fun competing in water-hat races, three-legged races and other unusual games. Anyone who would like to join in should fill out the form below and send it to Liz Mogavero, Bldg. 510A, or Betty Pergan, Bldg. 179A.

In addition to the Fun Olympics, the picnic will have terrific food, dancing, children's activities and plenty of places for just relaxing on the grass. It'll be a day to remember for the next 40 years — so get your ticket now.

Tickets are on sale for $3 each. Employees and retirees can buy them for themselves and their families at the BERA Sales Office from 9 a.m. to 2 p.m., or from: Renee Flack, Bldg. 185; Blanche Laskee, Bldg. 185; Liz Mogavero, Bldg. 510A; Betty Pergan, Bldg. 179A, and Rosalie Piccione, Bldg. 355.

Fun Olympics Entry Form

(Employees, Guest and Visitor appointees, and Retirees only.)

Name: _____ **Life/Guest No.:** _____

Department: _____ **Building:** _____

Please Check Appropriate Boxes

☐ **Male** **Unisex "Fun Olympics" T-Shirt Size**

☐ **Female** ☐ **S** ☐ **M** ☐ **L** ☐ **XL**

Age Category: ☐ **Under 35** ☐ **Over 35**

At the BERA Store

The BERA Store, located off the lobby in Berkner Hall, is open each workday between 9 a.m. and 2 p.m. In addition to photo finishing by Union Photo Company of Clifton, New Jersey, the store offers the following sales and services:

Merchandise Sales

Film, flashbulbs, batteries, a wide assortment of Majestic and Gordon Fraser greeting cards, and Lab-site postcards.

Ticket Sales

BNL 40th Anniversary Picnic tickets at $3; Great Adventure tickets at $14; UA Theater discount tickets at $3; Magic Kingdom membership cards for Disney World, Epcot Center and Disneyland at no cost to employees.

Metropolitan Opera and Islanders hockey tickets are sold during the regular seasons. Announcements are made in the Bulletin one to two weeks prior to the start of ticket sales.

Handouts

Twofers for some Broadway shows; travel brochures and flyers; B.J. Wholesale Club and Price Club brochures; various magazine discount subscription info flyers; copies of "East End Art News."

Posted Information

Particulars on discount programs offered by various business concerns to employees working on the Lab site.

Participation Awards

The BERA Store is the official redemption center for the BERA Participation Awards.

Store Clerk Louisa Barone can be reached on Ext. 3347 for more information.

Safety Shoes

The on-site safety shoe representative will be on vacation July 23-31. Normal hours will resume on August 3.

Position Open: Physical Review

The Physical Review has the following position open:

Editorial Assistant — Position available to assist editors in processing manuscripts for publication. Bachelor's degree required; physics/math background desirable, but commensurate experience in technical editing also acceptable. Submit resume to American Physical Society, Box 1000, Ridge, NY 11961, Attention: Personnel Department.

Cafeteria Menu

Week of July 20

Monday, July 20

French onion soup	(cup)	.75
	(bowl)	.95
Veal Parmesan w/1 veg.		2.85
Pepper steak over confetti rice		2.85
Ham salad w/fresh vegetable sticks (lite-weight)		2.20
Hot deli: Baked Virginia ham	(bread)	2.55
	(roll)	2.65
	(hero)	2.75

Tuesday, July 21

Turkey noodle soup	(cup)	.75
	(bowl)	.95
Pot roast of beef w/1 veg.		2.95
Sweet & sour chicken w/1 veg.		2.85
Avocado half w/turkey salad (lite-weight)		2.45
Hot deli: Monte Cristo sandwich		2.65

Wednesday, July 22

Cream of broccoli soup	(cup)	.75
	(bowl)	.95
Chicken & dumplings w/1 veg.		2.85
Taco		.85/ea.
Spinach soufflé w/1 veg. (lite-weight)		2.85
Hot deli: French dip		2.65

Thursday, July 23

Tomato beef vegetable soup	(cup)	.75
	(bowl)	.95
Super sausage pizza		1.00/slice
Beef & cheddar pie w/1 veg.		2.85
Seafood salad on croissant (on ice table, lite-weight)		2.25
Hot deli: Turkey	(bread)	2.55
	(roll)	2.65
	(hero)	2.75

Friday, July 24

Seafood gumbo	(cup)	.75
	(bowl)	.95
Shrimp scampi over rice		2.95
Spanish pot roast w/1 veg.		2.85
Taco salad plate (on ice table, lite-weight)		2.25
Hot deli: Chili dogs		2.45

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.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

2630. SECRETARIAL POSITION - Requires excellent secretarial skills and knowledge of MICOM word processing. Familiarity with IBM/PC - MICOM interface helpful. Under supervision of Division Secretary, will be responsible for extensive word processing of technical reports. Additional responsibilities will include maintenance of files, travel arrangements and correspondence. Department of Nuclear Energy.

2631. SECRETARIAL POSITION - Requires AAS in secretarial science or equivalent experience and a broad-based knowledge of Laboratory policies and procedures. Excellent secretarial and communication skills essential. Responsibilities will include heavy technical typing, correspondence and travel arrangements. Word processing experience necessary. Familiarity with IBM/PC helpful. Accelerator Development Department.

Autos & Auto Supplies

81 DODGE ARIES - 4 dr., am/fm, cb, a/c, p/s, good cond. $2,100. 277-5114.

76 CHEVY MONTE CARLO - runs, excel. for parts, $300. 582-9757.

78 MALIBU WAGON - V8, auto, p/s, p/b, 70k mi., $1,200. Don, Ext. 2249 or 286-1396.

CAMPER - 9½', slide-on, sleeps 5, w/stove, oven, sink, ice box, $400. Eve, 929-8876.

PICKUP CAP - full-size, 6½' bed, ladder, racks incl., $125. Frank, Ext. 5317 or 589-5980 after 6 p.m.

CAMPER TRAILER - 1970 Tagalong, excel. cond., many extras, $1,000 firm. Pete, 399-2813 after 5 p.m.

79 FORD BRONCO - 4x4, black/silver, 33" tires, 351m, must sell, $2,000. Mike, Ext. 2907 or 821-0318.

78 VW RABBIT - high mi., good running cond., gas, $500; 1980 utility trailer, metal, excel. cond., $200. 298-8087.

ENGINE - 72 Chevy, 350, 2-bolt main, rebuilt top to bottom, w/rebuilt heads, extras, $725. Ken, 473-7460.

82 PLYMOUTH CHAMP - clean, many extras. 363-7032.

79 T-BIRD - black, good cond., a/c, p/s, p/b, am/fm cass., many new parts, $2,000. Jerry, Ext. 7427.

79 VOLVO 244DL - 88k mi., excel. cond., $3,000. Frank, Ext. 2022 or 732-5950 after 5:30 p.m.

73 PONTIAC - 2 dr., a/t, p/s, p/b, am/fm cass., $400. Fred, Ext. 3259 or 473-8622.

79 DATSUN 510 WAGON - good running cond., $500 or best offer, Mike, Ext. 4345 or 473-9124 after 6 p.m.

83 YAMAHA VIRAGO - 750cc, black, mint cond., garaged, asking $2,000. Charles, Ext. 7749.

80 VW RABBIT - 5 dr., fuel inj., air, excel. cond., $1,500; Goodyear snow tires, F78, used one winter, on rims, $50/pr. Ext. 4960.

APACHE CAMPER - foldup, stove, dinette, sink, ice box, sleeps 6, not canvas, many extras. 475-3553.

80 SUZUKI - GS850L, windshield, tank, bag, low mi., garaged, excel. cond., best offer. 924-4749.

83 CAMARO 228 - V8, 43k, a/t, a/c, p/s, p/b, p/w, p/locks, p/hatch, cruise con., tilt wheel, excel. in & out, $8,300. Ext. 2922 or 395-1588.

81 DODGE - a/t, p/s, a/c, radio, reliable, must sell, moving, $950. Ext. 7697 or 928-8623.

TIRES - (2), R-78-15, white wall, $20/ea. Tony, Ext. 2050.

80 DODGE COLT - hatchback, 4 spd., manual trans., 90k, excel. body, runs well, $1,000. 928-3951.

CAP - 1975, for full-size pickup, 8', fiberglass, light, vent, lock, $200. Joe, Ext. 3464 or 281-7683.

81 CHEVY MALIBU - classic wagon, 73k mi., a/c, am/fm, roof rack, $2,500. Brant, Ext. 4552 or 929-3310.

76 CHEVY - K20, 4x4, 4 spd., p/s, p/b, 12.00-16.5 util. body, $1,500. Bart, 924-6761 after 5 p.m.

78 VW RABBIT - fuel inj., 91k mi., excel. cond., $1,000. Ext. 3821 or 473-6624 after 6 p.m.

83 TOYOTA SR5 PICKUP - 4wd, oversized radials, sunroof, loaded, mint cond., 575-5554 before 5 p.m. or 584-7970 after 5 p.m.

80 CAMARO - 6 cyl., 3 spd., am/fm, more, asking $3,000; 1978 AMC Concord, 6 cyl., a/t, am/fm cass., $1,250. Beeper 266 or 281-0360 after 6 p.m.

23 MODEL T FORD - roadster, restored to original, $7,000 firm. Dick, Ext. 3499 or 589-9103.

77 MUSTANG - 58k, standard, new clutch, brakes w/p, timing belt, $1,700 neg. 758-5592.

85 CHEVY S-10 PICKUP - 4x4, 4 spd., am/fm cass., all-terrain tires, bed cover, class II hitch, sliding back window, mint, $7,950. 286-1358.

70 CHEVROLET CHEVELLE - V8, p/s, a/c, runs, good heater, asking $350. Ext. 2238.

TRAILER - 1975, 27' Fare Luxury, fully equipped, bdrm., extras, good cond., $5,000. 878-2421.

78 PINTO - passenger door damaged, fix up or use for parts, best offer. Dick, Ext. 7185 or 744-6794.

MOTOR HOME - 1983 Honey, sleeps 6, 14k mi., like new, $16,900. Ext. 4188 or 363-5170.

85 HONDA PRELUDE - electric, sunroof, dk. blue, auto., p/s, p/b, am/fm stereo, 21k mi., mint cond. Ext. 2896 or 475-7454.

TIRES - (2), RE-71 (P215-60VR-14), unidirectional, used, good cond., sell to highest bid. Bob D., Ext. 2136.

77 GREMLIN - 3 spd., 6 cyl. engine, good running cond., asking $500. 744-2821.

75 WAGONEER - 4wd, new alt., starter, asking $1,200. 874-3796.

74 CHEVY C-10 PICKUP - 8' bed, 8 cyl., $600. 878-9076.

77 AUDI FOX - a/c, radials, excel. running cond., 85k mi., $1,700. Al, Ext. 4442 or 929-8411.

76 CHEVY SPORTS VAN - little rust, cruise control, trailer hitch, 96k mi. Ext. 3270 or Beeper 126.

80 OLDSMOBILE CUTLASS - 4 dr., diesel, am/fm cass., new battery, good tires, excel. cond., $2,100. Peter, Ext. 4004 or 286-0934 after 6 p.m.

73 VW 412 - 4 dr., rebuilt engine, a/t, reliable, $550. Yang, Ext. 3663/7751 or 924-1376 eves.

79 DATSUN 620 PICKUP - king cab, not running, $250. 878-9076.

73 PONTIAC - 2 dr., a/t, p/s, p/b, am/fm cass., $395. Fred, Ext. 3259 or 473-8622.

81 TOYOTA COROLLA - 80k mi., auto., rear-end damage, many good parts, $200. Ann, Ext. 3382.

73 MERCEDES BENZ 280 - 4 dr., white, dk. green interior, $4,300. Ext. 4099 or 689-9214.

84 HONDA ACCORD LX - hatchback, 5 spd., fully loaded, 55k mi., must sell, $6,400. Denise, Ext. 3630 or 783-1371 eves.

81 MERCURY CAPRI - 3 dr., 5 spd., sunroof, excel. cond., $2,200. George, Ext. 4100.

BED LINER - 8', black, full-size, 1 mo. old, $200. Ext. 4052 or Beeper 509.

Boats & Marine Supplies

22' COLUMBIA SAILBOAT - 6 h.p. Johnson, cradle, mooring, 4 sails, $4,500. Fred Sawicki, 981-4216.

14' HOBIE CAT TURBO - 1984, trailer, $2,000; 14' Bluejay sailboat, trailer, $500. Ext. 7657 or 924-2933.

17' COLEMAN CANOE - almost new, $260. Joe, Ext. 4139.

22' SEARAY - 1974, hardtop, new canvas, trailer, extras, excel. cond., $8,000 firm. 369-2838 after 4:30 p.m.

15' CRESTLINER - top and side curtains, 40 h.p. motor, good cond., $595. 878-6637.

26' CRISCRAFT - classic cabin cruiser, in water, ready to go. 475-3553.

CANOES - Old Towne, 16' Penobscot, $550; Carleton, circa 1910, restored, $850. Mike, Ext. 4061 or 475-8406.

12' SUNFLOWER SAILBOAT - all fiberglass, excel. cond., $350. Paul, Ext. 4665 or 727-4859.

SUNFISH SAILBOAT — Alcourt, new dolly cart and life preservers, good cond. Ext. 2381 or 929-3389.

Miscellaneous

CONVECTION OVEN-BROILER - Toastmaster countertop, 1 yr. old, excel. cond. Henry, Ext. 5110 or 399-3087.

FURNITURE - contemporary, living & dining rm., new. 924-1677 after 6 p.m.

SINK - s/s, 21"x24", $30; various windows, double hung w/storms, $5/ea.; thermopane double wide, double hung, $90. Victor, Ext. 2395.

COMMODORE 64 - disk drive, fast load, joystick, books, disks, $225. Frank Rumph, Ext. 5105 or 588-3565.

WEDDING DRESS - train, veil, size 12. 744-7590.

DESK - & chair, 30x60, formica & metal, heavy, $45; girls' bikes, 20" & 24", $10/ea.; crib, $15. 878-6637.

TOPSOIL - delivered, 5 yds. min., $15 per yd. 924-7746 or 924-9427 after 7 p.m.

WOMENS COCKTAIL DRESSES - brand-new, chiffon, size 6 to 13, $20 to $40 ea.; new women's leather shoes, size 8. 924-0960.

WASHER & DRYER - apt. size, reas.; sulky for Gravely tractor, reas. or trade. 363-7032.

FOLDING STROLLER - Aprica, ideal for travel, excel. cond., $50; infant swing, never used, $15. Ady, Ext. 4531 or 331-3785.

ORGAN - 4-person tent, apt.-size washer, screen tent, $15/ea.; bird cage, $3. 472-2251.

CRIB -& matching dresser, white & yellow, formica, $75. 924-9616.

TOASTER - hotplate; Mr. Hamburger; girl's roller skates, size 12; boy's ice skates, size 2, $3/ea. Jim, Ext. 2432.

LAWNMOWER - Black & Decker, electric, used one season, $50. Mike, Ext. 4345 or 473-9124 after 6 p.m.

OAK TABLE — brand-new, 4 chairs, corner hutch, 2 leaves, blue, 8x8 rug, $1,500. 298-4398.

PING PONG TABLE - like new, $50. Martha, Ext. 7655 or 584-7206.

DESK - 4 drawers, Charleswood oak headboard, den sofa, traditional cocktail table, 2 end tables. Jogger, Ext. 4960.

WASHER & DRYER - apt. size, w/rack, 110 V, portable washer, $450. Tom, Ext. 5350.

CONTENTS OF HOUSE - Polly, 744-2322.

ICE SKATES - good cond., woman's size 5, boy's size 3; man's ski boots, size 9, very low prices. Ext. 3535.

RAM CHIPS - 256k (19), $30. Jurg, 821-3243.

R/C MODEL TRUCK - "Blackfoot", fully assembled, needs motor, new gearbox, $75. Medina, Ext. 7636.

SIAMESE - & Balinese-type kitten, seal blue. Ramona, 928-3088.

ROTISSERIE - Farberware, open hearth, excel. cond., $20; tennis racquet, Wilson Advantage, wood, M-4⅜, excel. cond., $10. 473-7667.

GARAGE DOOR - 2 yrs. old, 4 over 4 glass, converted to den, complete, $75. Bob, Ext. 5010.

HYBRID DAYLILIES - mixed colors, $4/ea. 732-5451 after 3 p.m.

SECTIONAL SOFA - 3 pc., 15' long, brown tweed, Herculon, loose pillows, $150. John, Ext. 5261 or 883-9006 eves.

MARINE MODEL KIT - gen. instructions, diagrams, blueprints, nec. info., make offer; mahogany chest, good cond. 475-1254.

PIANO - upright, Harrington "standard," heavy cast-iron frame, good practice instrument, $100. Ext. 3535.

TV - 16", b&w; baby stroller; girl's bicycle. Akos, Ext. 4973 or 3170.

HEADBOARDS - (2), twin-size, maple, $15/ea. Tony, Ext. 2050.

WOOD STOVE - free-standing, airtight, w/screen, 5 pc. pipe, 2 wood carriers, accessories, $250. 758-5592.

FREEZER - Sears, chest, works well, $35. Ann, Ext. 3382.

CULTIVATOR - Mantis tiller, like new, used only 4 hrs., border edger incl., bargain at $199. 286-3235.

MOVIE CAMERA - Nikon, super 8, zoom lens, excel. cond., $75. John, Ext. 5152 or 281-2471.

PIANO - upright, $400; bike, Schwinn "Predator," $110. 581-7656.

LADDER - s/s, $25; 10' diving board, $25; 16' slide, $40; s/s, 1 h.p. sand filter, for in-ground pool, $60. Tony, Ext. 2462.

CEILING TILES - suspended, 2'x4', new, 22¢ per sq. ft. Ron, Ext. 7533 or 286-0353 eves.

WATERBED FRAME - queen, headboard, heater, velour siderails, must sell, $200. Denise, Ext. 3630 or 783-1371.

DINING ROOM - Colonial, table, chairs, hutch, server; Hitchcock bedrm. set, all excel. Ext. 7657 or 924-2933.

ROWING MACHINE - Precor Model 612, almost new, excel. exercise. Sandy, Ext. 3369 or 286-1022.

GOLF CLUBS - left-handed, full set w/bag, very good cond., $72 or best offer. John, Ext. 3406 or 821-3739.

DINING ROOM SET - teak, 7 pcs., tiled buffet, rolling bar, like new, asking $1,950. Al, Ext. 4442 or 929-8411.

STEREO - Hitachi, am/fm, turntable, 8-track, recorder player, 6 spkrs., excel., $325; computer, Texas Inst. T199/4A, like new, $75. Ext. 3392.

Free

CRIB - you pick up. 473-0794.

Yard Sales

BELLPORT - 7 General McLean Dr., 7/17-7/19, misc. furniture, household items, sport equip., etc.

PORT JEFFERSON - 114 Spring St., off Main, 7/18-7/19, 10 a.m.-5 p.m., moving, antiques, surfboards.

Car Pools

PATCHOGUE - van pool, seat open, leave name and number. Ext. 4669.

STONY BROOK - 14 Hawksnest, ride or share rides. Ext. 3770 or 751-7913.

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

CATSKILLS - 2 bdrm. chalet, on top of mountain, near Windam, Hunter, day, week, mo. rents. 928-1445 after 6 p.m.

MIDDLE ISLAND - Artist Lake condo, 1 bdrm., l/r, kit., full bath, a/c, new w/w, dishwasher, redecorated, pool, heat incl., 5 min. to Lab., avail. Sept. 1, $650. Ext. 3144 or 698-5046 eves.

PORT JEFFERSON STATION - 2 bdrm., l/r, kit, full bath, w/w carpet, professional single or couple, $700/mo. + util. 928-3033.

RIDGE - Scenic Hills, housemate needed to share a 4 bdrm. house, fully furn., close to Lab., $325 mo. for large rm., $250 mo. for small rm., incl. util, linen, kit. utensils. Ext. 4585 or 924-2865.

SHOREHAM NORTH - 4 bdrm. Colonial, 2½ baths, family rm., formal d/r, partially furn. 744-1750.

NORTH SHIRLEY - large furn. studio apt, w/kit., private ent., util. incl., 1 person only, non-smoker, no pets, 5 min. from Lab & stores, security, lease, $425/mo. pays all. 281-8044.

MANORVILLE - furn. studio, private ent., suitable for one, 5 min. from Lab, non-smoker, no pets, $350 incl. util. 878-2038.

HILTON HEAD, SC - 2 bdrm. condo, sleeps 6, open Aug. 22-28, golf, tennis, beach, pool, taking fall rentals, $400/wk. 585-9149.

For Sale

MASTIC BEACH - 3 bdrm. ranch, new kitchen & bath, spacious l/r w/fp, d/r w/ceramic tile floor, bsmt., garage, 60x200 fenced, city water, $95,500. 281-5456.

HILTON HEAD, SC - 3 bdrm. condo, l/r, d/r, wet bar, full kit., 8 appliances, 2 baths, adjacent Palmetto Dunes golf course, ocean beach, tennis, 3 pools, asking $89,000 assumable mortgage; also for rent at reas. rates. 929-8912.

OLD MEDFORD - M/D cape, 1 acre, partially finished bsmt., garage, f/p, low taxes, owner moving, reduced thousands, $145,000. 475-0961.

PORT JEFFERSON - 3-village, 4 bdrm., 2½ baths, attached garage, dry bsmt., den, garden, wooded backyd., ⅓ acre, $210,000. 928-0281.

SHOREHAM NORTH - 4 bdrm. Colonial, 2½ baths, fam. rm., formal d/r, 2-car garage, bsmt., patio, fenced, 744-1750.

MATTITUCK - 3 bdrm. ranch, l/r, d/r, kit., all appliances, playroom or den, 1½ baths, wood stove, solar h.w., 2-car garage, in-ground pool, ¾ acre, $165,000. Ext. 4489 or 298-4567.

ROCKY POINT TIDES - Hi-ranch, city water & gas, $158,850. 821-3709 after 5:30 p.m.

STONY BROOK - Framingham farm ranch, f/p, 5 bdrm., 3 baths, beautiful l/r, d/r, large eik, 2½-car garage, nicely landscaped 0.4 acres, by owner, $229,000. 751-4491.

RIVERHEAD - 12'x55' mobile home, 2 bdrm., 1½ bath, l/r, eik, new shed, dbl. drive, corner lot in adult/55 park on Peconic River. Jeff, Ext. 2907 or 727-5915 after 6 p.m.

MIDDLE ISLAND - immaculate 3 bdrm. Colonial, eik, huge den, formal d/r, a/c, 2-car garage, pool, sprinklers, fenced, $149,900. 924-4323.

OAKBORO, NC - 3 bdrm. modular home, 24x45, 1½ baths, l/r, d/r, kit., front porch, enclosed rear porch, cac, fully furnished w/appliances, 3½ acres, $50,000. Sheila, Ext. 3325 or 369-2404 after 6 p.m.

Wanted

USE OF ULTRASONIC CLEANER - need to clean item of sheet brass, 2" diameter. 924-5533.

APT TO RENT - from Sept. 1 or Aug. 15, furnished, short lease, family of 3. Ext. 2710 or 331-5993.

PERSON - non-smoking, to share large house in Wading River. Ray, Ext. 3624 or 929-3860.

BARN BOARDS - 10" wide, tongue & grooved, enough for garage door. W.L. Hughes, 286-3301.

ROOMMATES - with or without house to share. Walter, Ext. 5038.

TICKETS - (2), Pink Floyd, Madison Sq. Garden Concert. 589-4883.

BOAT SLIP - for 35' sailboat, S. Shore ideal, open to N. Shore. 225-2166 days or 654-1256 eves.

FISH TANK - large, 20-40 gal., w/stand & hood if possible, reas. Whitey, Ext. 2913.

OWNERS - of 1950's cars for on-site noontime get-together. Ken, Ext. 5110 or 4081.

BABYSITTER - for 3-mo.-old easy baby, occasional part-time on site. 864-1684.

TRUMPET - reasonable price. Paul, Ext. 4665 or 727-4859

HOMES - for assorted adult cats, w/shots, 744-2821 or 928-9537 leave message.

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