BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Heavy Ions in the AGS

Peter Horton

The AGS control room can be a crowded place during testing. Monitoring events during earlier tests done last month are, from left, (seated at console) Don Barton; (standing behind console) Richard Witkover, Philip Pape, Peter Thieberger, Kenneth Reece, Derek Lowenstein; (next row) Christopher Gardner, Michael Nekulak, Philip Stattel, Arthur Schwarzschild (partially hidden) Horst Foelsche, Harvey Wegner; (rear) Karl Kohler, Paul Stein, Arnold Stillman.

Every accelerator is designed to circulate certain kinds of particles, but design changes can make an accelerator hospitable for more than one kind of particle. That's what's happening these days at the Alternating Gradient Synchrotron (AGS). Its "native" particles are protons. But last week a species rare for the AGS was captured in its ring: heavy ions.

The capture of an oxygen beam from the Tandem Van de Graaff accelerator was an important milestone for the Tandem/AGS Heavy Ion Project. Project Head Horst Foelsche looked back to the evening of May 19 as the time when "everything started working nicely. The Tandem crew, under the direction of Deputy Project Head Peter Thieberger, delivered a steady beam through the newly commissioned heavy-ion transfer line so that systematic studies of the AGS system could begin." The tests, which went on until about noon on May 21, proved to be a continuing success.

Commissioning of the heavy ion beam in the AGS requires four steps: injection of a spiraling beam, capture of the beam for acceleration, acceleration of the beam and extraction of the beam to experiments. "We have very nicely demonstrated the first two and a little bit of the third," said Foelsche.

For injection tests, the initial goal was to circulate a pulse of heavy ions around the AGS ring. The first success came when one long, sausage-like pulse of oxygen ions passed by a pickup electrode in the ring five times in 100 microseconds. As the signal showed up on an oscilloscope, Don Barton, physicist in charge of AGS modifications for this project, and the others in the AGS control room knew they had passed an important hurdle.

The beam's death after five turns was expected at this early stage. Since there was no accelerating radio frequency (rf) system in use, the rising magnetic field drove the beam into the wall of the vacuum chamber. Still, by raising the magnetic field at various rates, it was possible to achieve significantly longer-lasting beam, up to 50 turns in one millisecond. After that, the next step was multi-turn injection.

"Multi-turn injection is how we will get useful intensities for heavy ion experiments," explained Barton. This involves sending a longer pulse from the Tandem and spiraling it into the ring over several turns. During these tests, the beam accumulated for a

(Continued on page 2)

Andrew Sunyar Dies

Senior Physicist Andrew W. Sunyar died on May 22 at Mather Hospital in Port Jefferson. He was 65 years old.

Sunyar joined the staff of Brookhaven Lab in 1949 and was an active member of the Physics Department until his recent illness. From 1960-73, he was Co-Group Leader of Brookhaven's Nuclear Structure Group. He then became Group Leader of the Laboratory's Tandem Van de Graaff Research Group, a position he held for six years. Under his guidance, the group attained world-wide recognition for its leadership in heavy ion physics.

With Maurice Goldhaber and Lee Grodzins, he collaborated on the experiment that determined the left-handedness of the neutrino, and he also made internationally acclaimed contributions to the study of nuclear structure and nuclear isomerism. Sunyar and his co-workers realized the significance of the discovery of the Mössbauer effect and were among the first in the world to apply techniques using the effect for measuring nuclear and material properties. In recent years, he was one of the pioneers in the investigation of high-spin states in heavy nuclei, and he was looking forward to working in relativistic heavy ion physics.

Physics Department Chairman Arthur Schwarzschild said of Sunyar, "Andy was a really great experimental nuclear physicist. In the late 1950's, he had one of the fastest coincidence systems in the world and was measuring subnanosecond nuclear lifetimes. He literally measured nearly a hundred isomeric lifetimes. From his arrival at the Laboratory in 1949, he was a leader in the Department of Physics and an inspiration to the many young physicists who worked with him and learned from him."

Recalling his colleague, former Lab Director Maurice Goldhaber said, "Andy Sunyar, with whom I worked closely for about 15 years, was a very skillful experimenter, precise, patient and persistent. His unique achievements have earned him a worldwide reputation among nuclear physicists. He was also a great human being, friendly and helpful at all times."

During his distinguished career, Sunyar received many awards. From 1960-61, he was a National Science Foundation Senior Fellow at the Institute for Theoretical Physics in Copenhagen, Denmark. As a recipient of the von Humboldt Senior Scientist Award in 1977, he spent a year at laboratories in Munich and Darmstadt in West Germany. He was elected a Fellow of the American Physical Society for his noteworthy contributions to nuclear physics. For many years, he was Associate Editor of the Atomic and Nuclear Data Tables.

Sunyar was one of the original members of the BNL Council. He served from 1962-64 and from 1966-68.

Andrew Sunyar was born in Henderson, Michigan. He received an A.B. from Albion College in 1942 and a Ph.D. in physics from the University of Illinois in 1949. At Illinois, he held the posts of research assistant and research associate and was a student of Goldhaber. During World War II, he served as an officer in the U.S. Navy.

Andrew Sunyar in 1970.

Sunyar is survived by his wife, Marjorie; two daughters, Andrea Gared of Paramus, New Jersey, and Elizabeth Kemery of Cleveland, Ohio; a son, James W. Sunyar of Sound Beach, New York; and four grandchildren.

Bhopal Study

In Bhopal, India, a 40-minute accidental release of methyl isocyanate (MIC) from a Union Carbide plant on December 3, 1984, killed over 2,000 people and injured an additional 50,000. Inhalation of the highly toxic chemical, used to produce pesticides, caused acute lung damage, with death due to severe pulmonary swelling and bleeding.

After Bhopal, the National Institutes of Environmental Health Sciences (NIEHS) initiated studies to broaden the currently scant knowledge of the toxicology of MIC, and, in particular, to look at short- and long-term health effects due to a single brief exposure. BNL's Ray Tice, Medical Department, is one scientist whose expertise was called upon.

Tice has had a long-standing contract with NIEHS to do genetic toxicology studies on animals. He and a team including Carol Luke, Valerie Miller and Brian Ormiston made repeated trips to NIEHS headquarters in North Carolina to collect samples of bone marrow and circulatory system blood from mice exposed to MIC. Cytogenetic analysis was done at BNL.

The team examined the samples for levels of sister chromatid exchanges (chromosome sections transferred among each other), chromosomal aberrations and micronuclei (small nuclear fragments of DNA), all of which can be induced by agents capable of causing genetic damage. They also looked for rates of cell division and blood cell production, measures of cytotoxic damage.

Initially, the results were inconsistent, says Tice. Later studies of tissue from mice exposed to higher doses yielded more definitive data.

In brief, here are their findings. Two exposure regimes were used — one-time exposures of two hours to male mice, at doses ranging from 3-30 parts per million (ppm); and six-hour exposures each day for four consecutive days to males and females, at 1-6 ppm. The one-time exposures induced significant delay in cellular division, but no significant increase in chromosomal aberrations, sister chromatid exchanges, or in micronuclei. Repeated exposures caused small but significant increases in chromosomal aberrations and in sister chromatid exchanges in both sexes. In one experiment, a significant increase in micronuclei was seen only in males. Finally, red blood cell production was depressed and cell division was delayed in both sexes, although more so in males.

Because MIC is so highly reactive with water, says Tice, genetic damage in cells distant from the lung was somewhat unexpected. "However, a recent biochemical study has shown that if MIC gets through the lung, it can bind reversibly to sulphur-containing proteins in the blood and travel throughout the body, causing damage elsewhere," he says. In a short exposure to MIC, then, the lung absorbs all of it, but in multiple exposures, the chances increase for MIC to get past the lungs. Therefore, systemic damage can depend on the individual's health, the integrity of the lung, and possibly on gender.

"Considering the exposure conditions in Bhopal," concludes Tice, "the risk for cancer is probably very minor compared to that for other diseases, such as persistent pulmonary dysfunction. As for the risk to future children, my gut feeling is that the possibility of damage to germ cells is even less than that for cancer."

— Mona S. Rowe

Mort Rosen

Five of the original members of the Cross Section Evaluation Working Group got together at the 20th anniversary. Henry Honeck, also one of the originals, was guest speaker at the dinner but was unable to be present for the photo. From left are Rafael Labauve, Los Alamos National Laboratory; Donald Harris, Rensselaer Polytechnic Institute; Sol Pearlstein, Director of the National Nuclear Data Center, DNE; Charles Dunford, DNE, and current chairman of CSEWG; and Cecil Lubitz, Knolls Atomic Power Laboratory.

They Focus on Reactors

For 20 years, the Cross Section Evaluation Working Group, more popularly known as CSEWG, has been meeting at Brookhaven, and last week the members celebrated their 20th anniversary. This group coordinates the national program for evaluating nuclear reaction and structure data used in nuclear power plant design, waste management, safety studies and isotope production. Representatives of national laboratories, the Atomic Energy of Canada, Ltd., and reactor manufacturers, have met as a working group once or twice a year since 1966.

The idea for the group grew out of a conversation then BNL employee Henry Honeck had with two colleagues in a Washington, D.C. restaurant in the early '60s. They were concerned with having a unified data file for all reactor design calculations. The idea was translated into the Working Group by Honeck, Jack Chernick, DAS, and Ira Zartman at Atomic Energy Commission Headquarters.

Originally, the Group's work centered on thermal reactors, then on fast reactors, and in the future they expect to focus on space reactors and charged particle reactions.

IBM 3090 to Replace CDC 7600

The CDC 7600, the 13-year-old main numbercrunching computer of the Applied Mathematics Department's Central Scientific Computing Facility (CSCF), is expected to be replaced by an IBM 3090 with more than three times the computing power. With an overall performance comparable to a CRAY 1-S supercomputer, the new system will be able to run existing programs up to six times faster than the old computer, as well as run much larger jobs. Subject to Department of Energy approval of the procurement, the new computer will be installed this fall, perhaps as early as October.

The IBM 3090 is one of IBM's newest computers and was designed for scientists and engineers. The new system will consist of an IBM 3090/180 central processor with the vector processing option, 32 megabytes of memory and ten gigabytes of disk storage.

Since the IBM 3090 is a modular, expandable system, it can be upgraded rather than having to be replaced. Three more central processors and associated memory and input/output systems can be added in the future to increase the computer's power by a factor of four.

The operating system will be IBM's VM/CMS system and will allow interactive and batch-mode computing. Users will have access to the system directly through terminals and by a network link through the VAX cluster.

The new system will cost approximately $3 million, about half the purchase price of the CDC 7600 it is replacing.

For several years, some BNL research programs have been suffering from the deficiencies of the CDC 7600. Lack of adequate memory, good software and support for existing software were among the most serious shortcomings identified by the Computer Policy Committee in a report issued three years ago.

"Also, users complain about it," adds Applied Mathematics Department (AMD) Chairman Ronald Peierls. "Replacing the computer with an upgrade has been in our long-range plans since 1977."

Bids on the computer were received in March, and the final selection was made based on price, performance and the evaluations of a panel made up of AMD staffers and user representatives. "Since the difference between the IBM and the next bid was large, the decision was clear-cut," explains Peierls. "It will do a good job of meeting the diverse needs of BNL's computing community, though no single choice can be ideal for everyone."

As Peierls explains, AMD's priority over the next six months is ensuring a smooth installation of the new computer, which includes connecting it to existing CSCF computers. "When the IBM 3090 is installed, the process of upgrading the CSCF will be completed, and we will have gone from obsolete technology to the latest state-of-the-art equipment."

A Lab-wide meeting will be held in Berkner Hall on Tuesday, June 10, at 1 p.m. to give more information about the new system, including plans for training, documentation, converting codes and the interface to the VAX cluster.

Heavy Ions (Cont'd)

healthy six turns.

Finally, to achieve acceleration, Ed Gill, senior technical associate, and Leif Ahrens, AGS physicist, engaged the rf system. Beam survival depends on the synchronism between the accelerating radio frequency fields and the rising magnetic fields. Too little rf acceleration and the beam will drift into the inside wall of the ring; too little magnetic field and the acceleration forces will push it to the outside wall. In fact, says Foelsche, "It's that synchronism that gives you the name 'synchrotron.' It's the balance between magnetic field and rf that keeps the particles in a nice orbit."

In the process of acceleration, rf causes particles in the ring to collect into tight bunches. During actual heavy ion operation, two rf systems will be used. The first will take the beam coming in from the heavy ion tranfer line at 0.12 times the speed of light (0.12c) and raise it to 0.5c. Then the task will be handed over to a second rf — one that can double a beam's velocity again, to raise it to nearly the speed of light, 0.998c. The first rf system is new, and while it has been installed in the ring, it is not yet fully operational. The second rf system is the old workhorse used for the AGS's regular proton physics program.

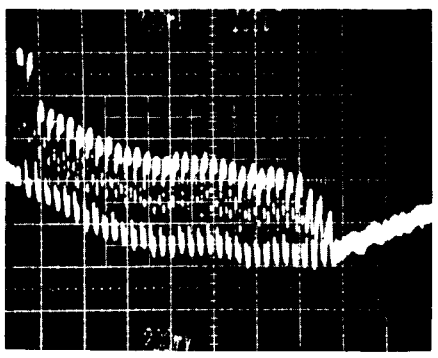
Using the second rf system, said Foelsche, "We captured the particles in such a way that they got a kick every time they came around and stayed in the center of the vacuum chamber." In this way, 60 bunches of oxygen ions sped through 2,400 turns of the AGS ring (1,200 miles) in 40 milliseconds. But because this rf doubles the initial velocity, acceleration went only from 0.12c to 0.24c, which is equivalent to an energy of about 19 million electron volts per nucleon. Said Barton, "This test told us a lot — that the signals necessary to get control of the beam are there and that we can get a velocity gain."

"From here on," Foelsche said, "the only new demonstration will involve acceleration to full energy, particularly the transfer between the two rf systems. We know once that is done, this beam will go all the way up and extract routinely because everything has been used many times before for the regular proton program."

The goal for completing these final tests is July 14, when the AGS will begin its summer shutdown for maintenance. In October, the project is scheduled for final tune-up and initial physics experiments. Said AGS Department Head Derek Lowenstein, "This is the first step to the future. This accomplishment, with the completion of the transfer line, the recent start-up of the new booster project and, soon, we hope, the start of the relativistic heavy ion collider [RHIC,] creates a whole new physics discipline at BNL."

While the discipline of heavy ion physics is coming on board, the AGS's regular physics program must take precedence, so very little time can be set aside exclusively for project testing. As Lowenstein said, "This is all being done in the context of other operating programs. It's not like bringing on a new machine in an open field, so this project has been more difficult. This has really been a magnificent collaboration between Physics and the AGS, and everyone involved should be congratulated for a job well done."

— Anita Cohen



One phase of the tests conducted last week for the Tandem/AGS Heavy Ion Project involved injecting the beam into the AGS and capturing it for several turns without the aid of the radio frequency (rf) acceleration system. This photo, taken from the control room oscilloscope, tells the story. Each separate white streak shows where a pulse of oxygen ions began a new turn of the AGS ring. Without rf, however, the beam inevitably drifts towards the inner wall. Here, 33 turns were completed in 700 microseconds, before the beam was destroyed.

NSLS Users Meeting

The fifth NSLS Annual Users meeting will be held on June 5 and 6 at Berkner Hall. All interested staff are invited to attend. Call Eileen Pinkston, Ext. 4194, before 5 p.m. today.

In Memoriam

Joanne Hansen, Loan Officer at the on-site branch of Barclay's Bank, died on Sunday, May 18. She was 44 years old. She was well known to employees having worked on site for the last 13 years. She is survived by two daughters, Diana of West Babylon and Deborah of Stamford, Conn., her mother, Catherine Filardo, and a brother, John Filardo, both of Hicksville.

Patent Awarded

Terje A. Skotheim, DAS, was awarded U.S. Patent #4,544,456 for inventing a method of synthesizing electrically conductive polymers from a solvent-free solid polymer electrolyte.

Due to their advantages of simplicity and ease of fabrication, semiconductor-electrolyte junctions have been produced by a number of innovative concepts that are designed to improve their stability and efficiency. A novel approach to the problem of stability of semiconductor electrodes has been the use of thin film solid polymer electrolytes. In Skotheim's invention, the film is formed by depositing it directly on an ultra thin electrode that is evaporated, or otherwise deposited, onto the solid electrolyte.

Shoppers Beware

Shopping through the mail can offer convenience, better service, wider selection and more complete product information. And you can save time and money. Most mail order companies are honest. However, when shopping by mail, you can protect yourself by taking these precautions:

- Deal with reliable firms. Check the reputation of mail order companies with the Better Business Bureau or Consumer Affairs office.
- Read the product description. Don't rely on pictures alone.
- Pay by money order or check. Never send cash.
- Keep a copy of the order and advertisements of the products, and note the mail order company's name and address and the date you sent the order.

If you have a complaint against a mail order company, you can get assistance from agencies including the Postal Inspection Service, Attorney General's Office and the Federal Trade Commission.

—BERA News—

Microcomputer Club

A demonstration of ASYSTANT, by Macmillan Software, will be held Thursday, June 5, at 10:30 a.m. in the AMD Conference Room, on the second floor of Bldg. 515. This scientific package has graphics, curve fitting, statistics, differential equations and data acquisition. It is menu driven, runs on the IBM PC and is less expensive than the ASSYST software. The Microcomputer Club will not meet that day. For further information, contact Jim Hainfeld, Ext. 3372.

Astronomical Society

This month's general observation night is scheduled for Friday, May 30, beginning at dusk, about 8:30 p.m., with the following Friday, June 6, as rain date. Admission fees will be collected at the observatory: $1.00 for adults, 50¢ for children under 15 and people over 65, free for members.

Call Rick Jackimowicz, Ext. 3803, or Bob Mills, Ext. 5043, during the afternoon of the observation date if you plan to attend. Membership information can also be obtained from either of the above.

Gym Summer Schedule

Effective June 1

Workdays
11 a.m. - 2 p.m. general activity, employees only
5 p.m. - 9:30 p.m. general activity, employees, families & guests
Weekends & Lab Holidays
Closed

Exception: From Tuesday, June 24, until 5 p.m. Friday, June 27, athletic activities will be preempted by the Blood Drive.

Guest Rule: One guest per employee is permitted at any of the recreation facilities. Advance arrangements for additional guests (up to five at any one time) must be made at the Recreation Office.

Softball

Games for week of May 19

League III

Septembers 18 - Turkeys 11
Survivors 8 - Mole-Esters 1
Snakebites 13 - Kidz-R-Us 8

League IV

Foul Ups 23 - No Feedback 15
Underalls 7 - Who's on First 6
Hit 'N Run 10 - Sandboxers 7
Mudville Sluggers 12 - Simply Awesome 8

CREF Values

April	71.97	May	75.52
June	76.40	July	76.69
August	75.94	September	73.77
October	77.12	November	82.20
December	85.78	January	86.50
February	92.83	March	98.20

April $98.28

All film badges will be changed tomorrow. Please place your badge in its assigned rack space before leaving work today.

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Hospitality News

The next monthly get-together of the Hospitality Committee will be on Tuesday, June 3, at 9:30 a.m., in Room C, Berkner Hall. Mary Gale of Bellport will demonstrate the art of tatting, the making of delicate lace by looping and knotting a single cotton thread with a small hand shuttle. She will provide materials for anyone who would like to try her hand at this craft.

Spouses of Lab employees and guests are welcome. Coffee, tea and danish will be served. Bring the children; babysitting will be provided free of charge.

Service Awards

The following employees received service awards during the month of May:

Thirty-five Years

John P. Galvin ..... Chemistry

Thirty Years

Hugh N. Brown ..... AGS

Twenty-five Years

Katherine S. Conkling ..... Medical
Jack E. Detweiler ..... Reactor
John M. Doorhy ..... S&EP
Arnold J. Esper ..... AGS
John F. Iulo ..... Plant Eng.
Anna M. Kuczynski ..... Fiscal
Graham F. Ryan ..... AGS
Walter Saunders ..... Plant Eng.
John D. Tilley ..... AGS
Philip H. Warner ..... AGS

Twenty Years

Lillian Kouchinsky .... Director's Ofc.
Robert Thomas ..... Chemistry

Ten Years

John F. Carew ..... Nuclear Energy
Arthur J. Coone ..... Supply & Mater.
James L. Durham ..... Plant Eng.
Richard A. Kayte ..... Plant Eng.
Robert J. Kennett .... Nuclear Energy
Lawrence I. Kleinman ..... Appl. Sci.
Eliza M. Langhorne ..... Staff Services
Brian D. Mayo ..... Supply & Mater.
Frederick C. Molone .... Central Shops
Jack M. Preses ..... Chemistry
Edward E. Rogers ..... Plant Eng.
Zaida Rosado ..... Plant Eng.
James Yerry ..... S&EP
Nancy M. Yerry ..... Nuclear Energy

Cafeteria Menu

Week of June 2

Monday, June 2

Cream of mushroom soup	(cup)	.65
	(bowl)	.85
Veal cordon bleu w/1 veg.		2.45
Fresh vegetable plate (lite weight)		2.35
Salisbury steak w/1 veg.		2.45
Hot Deli: Roast beef	(bread)	2.35
	(roll)	2.50

Tuesday, June 3

Beef barley soup	(cup)	.65
	(bowl)	.85
Turkey broccoli crepes w/1 veg.		2.45
Zucchini pasta salad (lite weight)		2.25
Carved ham steak w/cranberry glaze and 1 veg.		2.50
Hot Deli: Chicken Parmesan hero		2.45

Wednesday, June 4

Turkey rice soup	(cup)	.65
	(bowl)	.85
Sweet & sour chicken over fried rice		2.45
Hearty vegetarian garden plate (lite weight)		2.45
Spaghetti & meatballs w/garlic bread		2.45
Hot Deli: Fresh ham	(bread)	2.35
	(roll)	2.50

Thursday, June 5

Minestrone soup	(cup)	.65
	(bowl)	.85
New England boiled dinner		2.45
Fresh vegetable plate (lite weight)		2.35
Chicken Kiev w/rice pilaf w/1 veg.		2.55
Hot Deli: Baked virginia ham	(bread)	2.35
	(roll)	2.50

Friday, June 6

Seafood chowder	(cup)	.65
	(bowl)	.85
Broiled fish w/lemon butter and 1 veg. (lite weight)		2.65
Pepper steak over rice w/1 veg.		2.55
Fresh vegetable plate (lite weight)		2.35
Fruit & yogurt plate (lite weight)		2.25
Hot Deli: Corned beef	(bread)	2.35
	(roll)	2.50

It's Blatantly Unofficial

You are probably sitting there wondering if this or that could be considered a blatantly unofficial BNL record. O.K., here are a few submissions to get you started. You can see that they vary considerably, and that there are many ways to make a record.

The largest height difference between two people in one corridor of offices (module of Bldg. 130): Bill Gunther 6'5" and Mano Subudhi 5'4"; difference 13".
— Jim Higgins, DNE

The most mice trapped in one week (5) and the most thumbs trapped in one week (2).
— Tom Tallerico, AGS

We have the coolest job on site — delivering thousands of gallons of liquid hydrogen (-320^0 F) each week.
— Sam Cortes (driver)
& Lamar Gardner (stock clerk)
Supply & Materiel

The largest (8) all-female office on site, to which men are welcomed.
— Public Relations (Bldg.134)

Having one's picture displayed on the rogue's gallery at the NSLS for the shortest time. The record goes to the Playmate of the Month, May 1984. Her picture lasted less than six hours; appearing at 4 a.m. on the night of December 4, 1985, it had been removed by 10 a.m.
— Roy Rosser, NSLS

Entry for "Blatantly Unofficial BNL Records"

(Please Print)

Name .....

Department ..... Ext. .....

Corroborator .....

Department ..... Ext. .....

Proposed Record .....

.....

.....

.....

Date Proposed Record Was Set .....

Food Drive Extended

The Town of Brookhaven's in-house food drive for the Town's needy has been extended. Employees can bring canned goods to the Bera Sales Office through Tuesday, June 3. The Sales Office is open from 9 a.m. to 2 p.m.

Arrivals & Departures

Arrivals

None

Departures

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

Kenneth J. Buckleman .... Chemistry
Jayne Fuhrman ..... Tech. Infor.
Bo-Hai Lin ..... Biology
Michael A. Poetzsch .. Nuclear Energy
Kevin C. Rutkowski ..... Sfgds. & Sec.

It's a fact: There's no town of Marion on Long Island and never has been. So how did East Marion get its name? According to the Long Island Gazeteer, it was first called Rocky Point, but, in the 1850's when the community applied for a post office, they found that name already used. The name Marion was then suggested, after General Francis Marion, the "Swamp Fox" of Revolutionary War fame who was much admired. But there was already a Marion in upstate New York, so they settled on East Marion, because Suffolk is east of Wayne County.

Missing

Will the person who borrowed the Research Library's copy of Perry's Chemical Engineers' Handbook, 6th Edition, please return it promptly.

Photo — Long Island Farm Bureau

A farmers' market will blossom at the Lab for the fifth year on Wednesday, June 4. It will be open from 11:30 a.m. to 1:30 p.m. in the same spot — north of the tennis courts in the parking lot along Brookhaven Avenue. The farmers will truck in fruit, vegetables and floral products, according to the season, until November 19. As in the past, the market is for Lab employees only and is not open to the general public.

Classified Advertisements

Placement Notices

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

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

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

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

THE VACANCIES LISTED BELOW HAVE BEEN EXEMPTED BY THE DIRECTOR'S OFFICE FROM THE CURRENT FREEZE ON OPEN REQUISITIONS.

LABORATORY RECRUITMENT - Opportunities for present Laboratory employees.

2440. SECRETARIAL POSITION - Requires AAS degree in secretarial science or equivalent experience and knowledge of general office duties. Will assist lead secretary with correspondence, phones, report production, etc. Experience with technical word processing (preferably utilizing a pc) is required. Department of Applied Science.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2441. ELECTRICIAN A - Under minimum supervision lays out, constructs, installs, maintains, repairs and operates systems, equipment, controls and related devices. Requires minimum of five years' industrial electrician experience. Plant Engineering Division.

2442. TECHNICAL POSITION - Requires an AAS in mechanical technology or equivalent. Will be responsible for the maintenance of neutron spectrometers and the fabrication and operation of experimental equipment, such as cryostats and furnaces. Good communication skills are necessary to closely interact with associated technical and scientific staff. Knowledge of vacuum and cryogenic apparatus is highly desirable. Chemistry Department.

2443. ENGINEERING POSITION - Requires BS in electrical engineering, a related field, or its equivalent, and 10 years' experience in the nuclear industry to provide engineering and administrative supervision for the Reactor Instrumentation Group. Requires knowledge in nuclear, electronic and pneumatic instrumentation, including prior supervisory experience in these areas. Duties include oversight of reactor instrumentation maintenance and repair, and proposal of modifications. Technical writing ability a must. Requires ability to obtain DOE "Q" clearance. Reactor Division.

2444. ENGINEERING POSITION - Requires BS in mechanical, marine and civil engineering or equivalent and a minimum of three years' experience in plant or liaison engineering. Assignment involves project evaluation and the coordination of a variety of technical functions associated with water and electrical power distribution systems, electro-magnets, radiation shielding, and other equipment used in supporting the experimental program. Alternating Gradient Synchrotron Department.

Autos & Auto Supplies

RADIO - Delco, am, $10; s/s truck mirrors, $40; Chevy truck front bumper, $40; floor mats, (4), new, $30. Tony, Ext. 2462.

74 COMET - 302, V8, runs, good steel radials, battery, needs work, 82k mi., $200. Dunning, Ext. 4636.

75 CHEVY MALIBU - $350. M. Bonanno, 399-6367.

80 DODGE CHALLENGER - 5 spd., am/fm stereo cass., many new parts, very good cond., best offer. 698-7875 eves.

FORD - 6 cyl., 240 cu. in. eng. w/tranny, $200. Ext. 2023.

75 F100 PICKUP - 68k mi., excel. mech. cond., lots of rust, $850. John, Ext. 4153.

82 DATSUN SENTRA - 4 dr., h/b, sunroof, a/t, p/s, p/b, a/c, am/fm radio, clean, excel. cond., $4,995. 728-6353.

VW STEREO - am/fm, $40. Ralph, Ext. 2368 or 928-6654.

78 FORD RANGER XLT - pickup 4x4, F150, a/t, a/c, p/s, p/b, c/c, new wheels, 33" tires; 81 FORD RANGER pickup, 4 spd., 300, 6 cyl., a/c, p/s, p/b, c/c, excel. cond., $4,600. 265-4715 after 6 p.m.

83 PLYMOUTH WAGON - a/c, p/s, p/b, a/t, silver blue, good tires, high mil., $1,600. 821-9296.

79 YAMAHA 650 SPECIAL 2 - black, 10k mi., good cond., $500. Henry, Ext. 3082 or 878-9551.

81 YAMAHA 850 - full dress, 5,100 mi., drive shaft, 3 cyl., $1,700. Frank, 669-8880 days.

78 PINTO WAGON - body good, (4) new tires, battery, runs well, $700. Joe, Ext. 4661 or 878-2203 after 5 p.m.

74 MONTE CARLO - new eng., trans., mag wheels, cass., $900 or best offer. 727-1025 after 5 p.m.

80 DATSUN 200SX - sunroof, p/s, p/b, 5 spd., a/c, am/fm stereo, 72k mi., $3,200 neg. 654-0830 after 6:30 p.m.

78 DATSUN B210 GLX - h/b, a/t, good cond., $700. Ext. 3954.

83 VW GTI - black, sunroof, stereo/cass., alarm, vent windows, extra wheel, $5,500. 929-8614 or 744-4445.

82 BRONCO - 350 CI, black, p/s, p/b, a/c, am/fm, excel., $9,000. (718) 886-0993 after 5 p.m.

TIRES — (3), radial steel belted, all season, General, P195/75R14-XT, $55, good thread. Gus, Ext. 5079.

78 CHEVY PICKUP - 8' bed, roll bar, snow plow, recent paint job, good cond., $4,500. Ext. 5318 or 727-6280 after 6 p.m.

85 FORD RANGER EXPLORER - 4x4, V6, 5 spd., cap, 24k mi., $825. Ext. 2023 or 585-8809 eves.

80 PUCH MOPED - not running, $150. Hayes, 475-7025.

77 OLDS CUTLASS - V6, a/t, p/s, p/b, a/c, am/fm, high mi., needs work, best offer. Ext. 4950.

71 DODGE FLATBED - 1 ton, slant 6, very good cond., $950; 878-6637.

84 CAMARO - Sport Coupe, a/t, p/s, p/b, o/d, sport wheels, inter. wipers, t-tops, white/blue int., tinted windows, new cond. 473-6294 eves.

77 PLYMOUTH TRAILDUSTER - 4x4, 360 eng., a/t, a/c, p/s, p/b, 76k mi., body bad, mech good, many new parts, $2,800 neg. Ken, Ext. 2350 or 698-4254.

75 PLYMOUTH GOLD DUSTER - 6 cyl., a/c, am/fm radio, good running cond., $600. 924-3236.

78 TOYOTA CELICA GT COUPE - 5 spd., Special Black Edition, sunroof, a/c, am/fm cass., garaged, mint. Donna, Ext. 2085 or 277-7770 eves.

78 HONDA CB550 - new battery, manual, black, 5,500 mi., $600. Rich, Ext. 4662.

82 CHEVY MALIBU CLASSIC - wagon, very sound cond., $3,900; 78 Cadillac Fleetwood Brougham, like new, $3,900. 475-4596.

77 PONT LEMANS - 2 dr., a/c, high mi, $375. 472-1479.

80 AMC SPIRIT - sq. h/b, 4 cyl., 4 spd., 6 wheels (2 snows), 66k mi., asking $1,900. Call 286-3374.

75 CADILLAC COUPE DE VILLE - excel. cond., $1,200. 751-1413.

74 MG - $400. Ext. 7633.

74 CADILLAC - Fleetwood Brougham, fully loaded, p/s, p/b, a/c, am/fm, 4 dr. sedan, 68k mi., $1,575. Fred, Ext. 3259 or 473-8622.

RADIATOR - Plymouth, V8, $20; 7 blade fan, $5. Frank Rumph, Ext. 5107 or 588-3565.

84 CHRYSLER TOWN & COUNTRY - wagon, fully loaded, mint cond., 32k mi., $6,950. 477-2262 after 6 p.m.

79 PLYMOUTH VOLARE - wagon, white, 6 cyl., p/s. p/b, new a/t, roof rack, 71k, excel., asking $2,200. Ext. 7505 or 689-8605.

74 AMC AMBASSADOR - wagon, 9 pass., V8, a/c. 90k mi., runs well, $500. Al, Ext. 4215 or 798-2002 eves.

83 NISSAN PULSAR - 4 dr. sedan, p/s, p/b, a/c, am/fm stereo, 5 spd., mint, 33-37 mpg. Ext. 2198 or 744-4662.

75 OLDS DELTA 88 - p/b, p/s, a/t, a/c, am/fm cass., runs well, new tires, $600. Ext. 2788 or 2337.

ROOF TOP CARRIER - Sears, fiberglass, used once, orig. $96, asking $50. Ext. 4289 or 878-2421.

73 VW SQUAREBACK - std., new muffler, alt. & batt., reliable, $850. Ext. 4463 or 751-2422.

84 TOYOTA CELICA GT - 10,800k, elec. s/r, a/c, TuTone paint, grey/black, mint cond., $8,900. Richie, 231-5749.

75 IMPALA - blue, a/c, a/t p/s, p/b, am/fm, good tires & body, recent tune-up, powerful, reliable, $795. Ext. 4118 or 928-5714.

73 VW BUS - a/t, 20k on new eng., reblt. trans., very good cond., $2,500. Ext. 4463 or 751-2422.

80 OLDS OMEGA - 2 dr., auto, V6, p/s, p/b, am/fm cass., $2,000. Bill, 472-4684 wknds.

75 GRANADA - 62k orig. mi., good mech. & tires, $1,300. Ext. 7699 or 821-1435.

82 DODGE -pickup w/cap, std. w/overdrive, 31k mi., excel. cond., $4,500. 472-0339.

TIRES - (2), P195/75R14, Firestone, 722 steel belted, radial, w/w, $30. 727-5912.

77 DATSUN B-210 - excel. cond., no rust, 4 spd., a/c, am/fm, new clutch, front end. 928-4683.

77 PLYMOUTH ARROW 200 - 2 dr., h/b, low mi., a/c, radio, excel. cond., $1,350 or best offer. Ext. 2611 or 475-4098.

73 PLYMOUTH DUSTER - p/s, p/b, $400. Inés, Ext. 3449 or 3092, eves./wknds.

73 VW SQUAREBACK - good cond., reliable, many new parts, 30 mpg. Wolfgang, Ext. 5295 or 744-7006.

75 GRANADA - stick, 87k, reliable, excel. running, $550. Ext. 2455 or 331-1432.

71 TORINO - 4 dr., 302, a/t, p/s, stereo, new tires, good running, body fair, $450. 473-7186 after 6 p.m.

79 TOYOTA COROLLA - am/fm, a/c, good cond. in & out. Michael, 821-9709.

80 TOYOTA COROLLA - 4 dr., 5 spd., am/fm, excel. cond. in and out, $2,800. 862-7821 eves.

75 VEGA - red sedan, auto, runs well, $250. Ext. 3403.

75 DODGE DART - 2 dr., 81k mi. Ext. 7181.

80 HONDA STATION WAGON - 5 spd., am/fm, 62k mi., asking $2,000. Wells, 878-4214 eves.

TIRE - G78-14, new, 4 ply, on GM rim, $35. Ext. 3312.

73 VW BEETLE - handyman's spec., $50. 281-8458 eves./wknds.

Boats & Marine Supplies

11' RUNABOUT - $135. 878-6637.

SAWYER CANOE - new, DY Special, green, w/52" Gilespie paddle, Liferest, tie-down carrier kit, $850. 821-0137.

TANZER 22 - excel., glass, new sails, roller furling, shoal draft (K/CB), 6 HP Chrysler, $7,700. Ed, Ext. 7943 or 589-3992.

16' SAILBOAT - O'Day sailer, fiberglass, dacron jib, main., $950. 286-0682.

28' OWENS - eng. needs work, new canvas & hardtop, sleeps 4, head, sink & stove, extras, $1,500 firm. 281-0360 after 6 p.m.

26' PEARSON - 1972, 15 HP Evinrude, 5 sails incl. spinnaker, DF, VHF, extras, $9,900. Ext. 4099 or 689-9214.

16' V HULL BOWRIDER - 1983 4 Winns, 120 HP Merc. cruiser, 15 hrs., full canvases, galv. trailer, power winch, garaged, $7,500 firm. 286-8797.

19' TRI-HULL - Evinrude, fiberglass, needs o/b motor, $750; w/trailer, $1,250. 732-3707.

21' SHARPIE - good work boat, $400. 732-3707.

26' POLARIS - f/g sloop, Atomic 4 inbd., 7 sails incl. spin. & furling genoa, extras, $7,500. 928-3371 after 6 p.m.

18' BOWRIDER - 100 HP motor, trailer needs work, fair cond., asking $1,200. Wells, 878-4214 eves.

16' BAYLINER - cuddy cabin, used once, 85 HP eng., trailer, C.C. pkge., cover, garaged, show-rm., extras, $7,000 firm. 289-3360.

16' DURATECH - alum. runabout, 25 HP, elec. start Chrysler, depth sounder, trlr., extras, $1,000. Sanchez, Ext. 3848 or 281-6498.

Miscellaneous

U.S. OPEN TICKETS - June 9, 11, and 13. George Vineyard, Ext. 3335.

AIR HOCKEY GAME - practically new, $10. Ralph, Ext. 2368 or 928-6654.

COMB. ALUM. STORM DOOR - screen, wood front, weatherstrip w/jams, 1-3/4 x 36 x 6'8". 475-0509.

HOOVER CANISTER VACUUM - w/attach., paid $200, sell for $50. 744-9677.

LOVESEAT - $50; (2) maple end tables, good cond. $20 ea. 584-5972.

DINETTE TABLE - w/4 chairs, square, maple; Sears Craftsman Eager 1, lawn mower, w/rear bagger, $100. 929-4840.

WET SUIT - size large. 475-4199.

MOVIE CAMERA - B&H, Super 8, w/power zoom and carry case, $40; maple crib, $40. Sal, Ext. 2460 or 744-9822.

RIDING MOWER - 5 HP, Craftsman, 26", motor needs work, $50. 924-3236.

REFRIGERATOR - GE, 18 cu. ft., w/icemaker, avocado, excel. cond. $250. 751-0923.

SOFA - excel. cond., $80; quick, before it goes to charity. Ext. 4192 or 751-7787.

HAY - for garden mulch, $2/bale. Ext. 3841 or 286-9450.

LIVING ROOM FURNITURE - includes sofa, bed, 2 tufted chairs, telephone stand, TV stand, recliner. Ext. 4628.

FOLDING TABLE - metal, $15; pressure cooker, stainless steel, $15; medical encyclopedias, $25. 751-4822.

CAMERA - Olympus, X-A, with flash, leather case, like new, $50. Naomi, Ext. 3699.

COLOR TV - Magnavox, 15", solid state, good cond., $40. Ext. 7732.

TV - b/w, beach chairs, elec. blanket, various baby items. Ines, Ext. 3449, 282-3092 eves.

BRITTANY SPANIEL PUPPIES - Champion Stock, ready early July, 744-0047.

SANSUI STEREO - rack system, w/extras, excel. cond., $500. Marck, Ext. 5350.

3M DISKETTES - 5-1/4", new, 10/$10; portable typewriter, $25. Jim, Ext. 3372.

ROPER LAWN MOWER - 21" cut, 3.5 HP, rear bagger, 2 yrs. old., $80. Joe, Ext. 2022 or 331-2228.

5000 BTU AIR CONDITIONER - window, excel. cond., $50. Dick, Ext. 4289 or 878-2421.

SEWING MACHINE - Singer, portable, new, w/attach. Jean, 286-4815.

TANK - 80 gallon, w/water pump, like new, $100; 4 KW generator, 8 HP, new engine. Sanchez, Ext. 3848 or 281-6498.

SOFA - loveseat; La Machine food processor; folding bed w/mattress, neg. Rajiv, 924-1460 eves.

CALENDARS - pocket, 1-1/2 yrs., Statue of Liberty covers, Susan, Ext. 4267.

MICROWAVE - Amana, full size, $100; tv, cabinet, dark pine, excel. cond., $75. Sue, Ext. 2050 or 289-6844.

TABLE - dinette, 42" round with (2) 9" leaves + 4 chairs, excel. cond., $125. 325-0314.

BICYCLES - girls, washing machine, infant seat, swingomatic, crib, etc., 751-4539.

TRAIN LAYOUT - 4 x 6, Ho Scale, $10. 736-3384.

Car Pools

BABYLON - (3) person car pool, need (1) more driver, 8:30 to 5:00. Mike, Ext. 2705.

Real Estate

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

For Rent

NORTH SHORE - apt., priv., quiet, 1 or 2 persons, all appl., 261-2454 after 5 p.m.

CENTEREACH - furn. apt., 1 mi. from Models, bdrm., l/r, kit., bath, w/w carpet, no pets, $500 mo. plus util., 1 mo. sec. 588-7260.

PATCHOGUE - 2-3 bdrm. apt., avail. through late summer, furn. or unfurn., excel. location on stream, $600 mo. plus util. Ext. 4094 or 751-6575 eves.

CATSKILLS - chalet, 3 bdrms., sleeping loft, fully furn., near Hunter Mt., music festivals, golf, fishing, rafting, hiking, weekly or weekends. Judy or Kay, Ext. 3595, or Bea, Ext. 3642.

HILTON HEAD, SC - 2 bdrm. condo, tennis, golf, beach, pool, extras, $400. wk. for Lab employees and families. 585-9149.

WHITE MOUNTAINS, NH - lovely, 3 bdrms., 2 baths, riverfront condo., cable TV-HBO, f/p, priv. deck, view, pool, tennis, clubhouse, jacuzzi, near all area attractions, shopping, golf, July-August, $425. wk. June and Sept., $390. wk. (914) 232-4039.

SHIRLEY - 2 bdrms., l/r, eik, full bath, newly decorated, walk to beach, $675 mo. incl. util. 744-2821.

WADING RIVER - fully furn., lakefront property, SWR schools, avail. 9/86 - 6/87. Ext. 3822 or 929-6527.

SHOREHAM - fully furn. 8 room house, 4 bdrms., 2-1/2 baths, SWR schools, pool. 744-7642.

ROCKY POINT - 2 bdrm. house, 1 block from beach, 15 min. from Lab., $600. mo. plus util. 922-2024.

For Sale

BIRCHWOOD - 2 bdrm. condo., 2 baths, on golf course, central a/c, all appli., club house, indoor-outdoor pools, tennis. $110,000. 698-6470.

RIDGE - 1 acre bldg. plot, 100'+ x 400'+, 80% cleared, 20% wooded, ready to build, $49,500. 924-3236.

OAKDALE - Idle Hour section, near water, 2 story Tudor, 4 bdrms., 2 baths, garage, attached, full apt. w/priv. ent., located on 1/2 acre on dead end street. $189,000. 363-6940 eves.

MEDFORD - 3 bdrms., l/r, d/r, kit., f/r, w/w, appl., attached 1-car garage, fenced yard, landscaped, residential, extras, $98,500. 698-0576 after 9 a.m. or 286-2005 after noon.

SHOREHAM - 3 bdrm. ranch, garage, Florida rm., cul-de-sac, 1/2 acre plus., all appl., pocl, extras. $100,000. 744-1429.

SOUTH BAYPORT - 3 bdrm. house, split level, large playroom with f/p, pool, fenced yard. 472-1394.

PORT JEFF. STA. - 3 bdrm. hi-ranch, 1-1/2 baths, l/r, d/r, fenced, 1/3 acre, pool, large master bdrm. OHW heat. $123,500. 331-3841.

Wanted

OUTBOARD - 10-15 HP. Michele, 698-7731.

FEMALE HOUSEMATE - 2 bdrm., Mt. Sinai area, immac. house, 1-1/2 acres, quiet area, furn., all util., cable, $475 mo. 473-6432.

APT. TO RENT - or small house, Bayport or Blue Point area. Ext. 2484 or 289-3684.

CHILDCARE - summer job, exper., 1 child or several, Bellport area or onsite. Liz, 286-8563.

SUMMER HELP - room, board, small salary, light housework, child care, Shoreham, on Sound. Ext. 3401 or 744-6229.

AIR CONDITIONER - 110 V. Pete, Ext. 4819 or 289-7218.

HOUSE TO SIT - free, caring, exp., rel., any period after 6/27. Jack Allentuck, Ext. 2412.

INFORMATION - on Estey Organs from Person. Al, Ext. 2043 or 727-7115.

RIMS - 9.50 x 16.5, Ford-F250 4 x 4, 8 holes, need 5, must be good cond., Artie, Ext. 2957.

HOUSE TO SIT - 7/1/86 - 8/31/86. Lynette, Ext. 7976.

ROWBOAT - wooden, good cond., will pick up, 281-4547.

HOME - for adult cats and kittens, shots and neutered, 928-9537 or 744-2821.

CONNIE FRANCIS RECORD - or album with song "Baby's First Christmas". Larry, Ext. 2021 or 281-7240.

PERSON - to clean, do laundry, for working couple, occasional child care, non-smoker. Mon-Fri., 10 a.m. - 1 p.m. 744-4611 after 7 p.m.

HOST FAMILIES - S. Country SD, for French students, age 13-21, 4 wks. beginning 6/28. 286-3742 eves/wknds.

Free

PICKUP BED - and homemade cap. 878-6637.

Lost

BRACELET - gold chain, in pool locker or vicinity, April 15. Ext. 7108.

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