BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

RFQ AOK on First Try

Tuesday evening last week, the radiofrequency quadrupole accelerator proved its stuff. It worked on the first try.

The accelerator, familiarly called the RFQ, is a major component of an extensive effort that will soon put polarized protons into the AGS. The polarized beam will allow the world's first studies of spin-spin forces of spinning protons above 12 GeV.

Significantly, the RFQ's success points the way to a time when these accelerators, because they are easier to work on and more reliable, will replace Cockcroft-Walton accelerators. The AGS uses a Cockcroft-Walton to preaccelerate particles before they enter the Linac and then are injected into the AGS ring.

Credit for designing the new RFQ goes to a team of specialists: Sal Giordano, electrical engineering; Ray McKenzie-Wilson, mechanical engineering; Hugh Brown, beam dynamics; Thomas Clifford, computer programming; Mario Puglisi, resonant frequency calculations; and Phillip Warner, technical support. In the initial stages of the project, Henry Halama was involved in selecting parameters for beam design. Also, Brian Briscoe and Gilbert De Gregory, from the Linac group, constructed the rf power amplifier system.

The team effort began two years ago, when RFQs were already being designed at other accelerator laboratories around the world. Now, four are operating. The newest to come on line, BNL's RFQ, is unique among all the others. It is the only one to accelerate polarized H^- ions, which will end up in the AGS as polarized protons (after an additional step of stripping away the electrons).

The polarized H^- ions are produced in an ion source upstream from the RFQ. The ion source is also a new machine built for the polarized proton project. Work began on it two years ago and a year later it was producing particles (see Bulletin story July 1, 1983). Recently under the direction of Jim Alessi, the ion source was moved into its present location and connected to the RFQ with a transport line.

Briefly, the ion source takes hydrogen gas, polarizes the gas in a magnetic field so the atoms are spinning in one direction, and then adds an extra electron to each hydrogen atom, resulting in negatively-charged ions. The polarized H^- ions leave the ion source at 20 kilovolts (keV) and are transported to the RFQ.

Mostly made of copper-plated steel, the RFQ is a tube about five feet in length and one foot in diameter. Attached to the inside of the tube and running its length are four copper-plated steel vanes that project radially toward the center. The tips of the vanes are machined in a wave-like pattern (see story this page) that causes the radio frequency electric fields in the RFQ to bunch, focus and accelerate the polarized H^- ions to 760 keV.

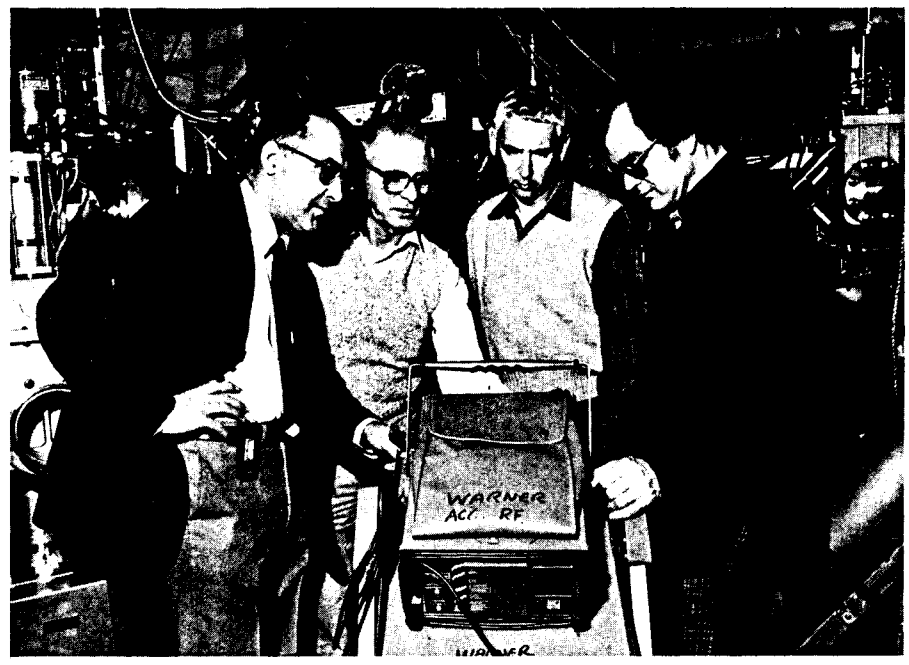
Downstream from the RFQ is the Linac, and in between, another transport line. These transport lines connecting the ion source and RFQ to the Linac were also built anew, under the direction of Yousef Makdisi.

When the RFQ was successfully turned on last week, it completed the new, first half of the polarized proton program.

This week, the beam is being fine tuned and diagnosed. The next step will be to inject the beam into the Linac and check the polarization when it comes out at 200 MeV. Finally, the polarized H^- ions will be transported into the AGS. – Mona S. Rowe

Flash!

As we went to press, the Bulletin learned that at 3 a.m. on Thursday, 1.5 microamperes of polarized H^- ions were accelerated through the Linac at 200 MeV and 65% polarization.



Alex Reben

At the new RFQ accelerator are some members of the design group that saw the project completed last week with a successful run. From left are Ray McKenzie-Wilson, Sal Giordano, Phillip Warner and Thomas Clifford.

On The Cutting Edge

At the heart of the RFQ accelerator are four steel vanes, each 54 inches long, one inch wide at the base, and narrowing to a half inch at the tip. The tips of these vanes look like waves, and it is the waviness that controls the RFQ's ability to properly bunch, focus and accelerate particles.

Last summer, the initial theoretical design of the vanes was perfected, and it was time to fabricate them. That job went to the experts in this kind of work — the heavy machine shop of Central Shops.

Says supervisor Henry Jimenez, "Each vane took five days of around the clock milling. We had machine operators working continuous twelve-hour shifts to get the job done."

A large and sophisticated machine was used, called the computer numerically controlled machining center. It had to be outfitted with a custom-made cutter.

The machine can accept precise computer commands punched out on paper tape. Instructions for a single vane filled nearly a half mile of tape.

The vanes took many days to mill because of precise surface requirements. Machine cuts only two one-hundredths of an inch were made with each pass. Also, each vane had to be done in a continuous operation. As Jimenez explained, if the machine had been turned off, it would have cooled down. That change in temperature would shift the position of the cutter, ruining the precision of the cuts.

Thinking back to the varying waves cut into each vane, if one were to sight down a vane (as the particles enter the RFQ), one would see the crests of the waves get further apart. It is these variations which accelerate the particles. Looking from the side at the full

(Continued on page 2)

Mathematics and Moviemaking

"Written and produced by H. Bruce Stewart."

So far, two feature-length, animated, 16mm films share that distinction. But why is Stewart, a mathematician in the Applied Math Department, involved with filmmaking?

Stewart is concerned with a relatively new science known as dynamical systems theory. "What's new about this," says Stewart, "is chaos. In this case, chaos has a very special mathematical meaning. It's something produced by a simple system that doesn't seem to have anything random about it, but which behaves in a random way." Stewart feels that film offers a good way to bring mathematical order out of chaos.

An automobile, for example, is a simple system which should run smoothly, its engine humming along in a periodic fashion. But, as we all know, engines go out of tune, sputtering unpredictably. "You might think that could be caused by something random, like dust," Stewart says, "but people are finding out you don't have to put in anything to have chaos. If your car is out of tune, your engine may be producing chaos."

As Stewart's statement implies, chaos is not random. It was a desire to give visual form to that fact which started Stewart on his career as a filmmaker. But desire was not enough. To produce his films, Stewart also needed both a computer and the COMp80 in the Photography & Graphic Arts Division.

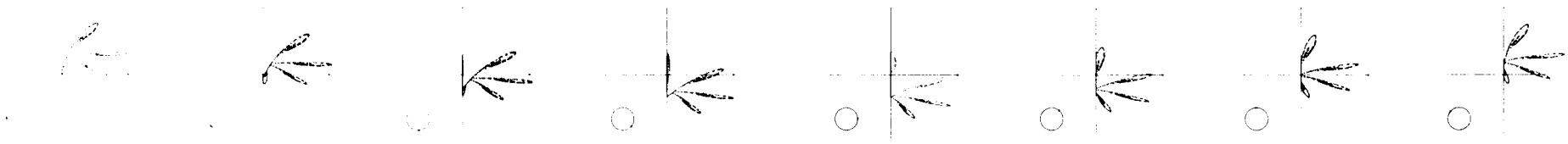
The COMp80 is well known for its facility in producing 35mm slides and printer ready copy from computer tapes. But another of its capabilities is that a 16mm movie camera can be mounted in front of its screen to create black and white or color animated film of the computer's data. Stewart is the first person at Brookhaven to use the COMp80 in this capacity, and the first person anywhere to apply it to dynamical systems theory.

To create his films, Stewart first wrote the software by which his computer could animate mathematical models of strange attractors, the theory's term for what causes a deterministic system to behave in an erratic fashion. As the different motions from the same system flash in front of the movie camera, the results show that they all fall into a pattern, the strange attractor. And as these seemingly random elements mount up on film frames, it becomes apparent that the attractor itself is periodic. After some initial disorder, the strange attractor settles into a rhythmic pattern, periodically deforming and reforming.

Producing these movies is time consuming. Each minute of Stewart's 25-minute black and white film took from one to two hours of COMp80 time. And he's just finished splicing his first color effort, which required up to six hours for each minute. But Stewart feels the results are worth it. "A lot of people have used computer graphics to study this. But they don't show the orderly nature of the chaos so clearly. This is a substantial improvement over still pictures."

—Anita Cohen

Beginning Monday, March 5, Bruce Stewart will present a series of weekly lectures to introduce applied scientists and engineers to the basics of dynamical systems theory, with the emphasis on recent discoveries concerning chaos and strange attractors. For an outline of the lectures, which are scheduled for Mondays at 2 p.m. in the seminar room of the Applied Math Department, Bldg. 515, call Stewart on Ext. 4179.

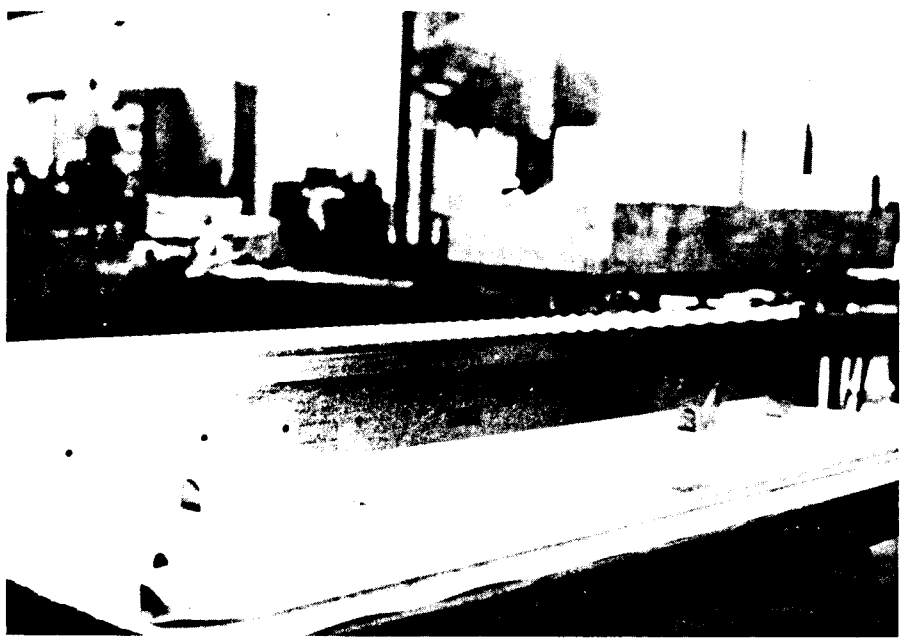


The COMp80 produced these frames of a chaotic attracting structure using Bruce Stewart's animation system. Each point in the cloud marks the instantaneous velocity (y-axis) and position (x-axis) of a tethered off-shore oil platform in a rolling sea. The cloud was obtained from a simple mathematical model of an offshore platform, by following the evolution of randomly chosen initial states. The coherent structure, seen here in eight successive steps through one full cycle of an ocean wave, is evidence of a chaotic attractor.

RFQ (Cont'd)

Alex Reben

Some of the people working on the polarized H^- source and transport line: kneeling (from left), Walter Shaffer, Al Mack, Steve Bubka, Brian Briscoe, Yousef Makdisi, Brent Ewing and Sal Giordano. Standing, 1st row, Bob Larson, Dan McCafferty, Mona Vitale, Ahovi Kponou, Kathy Brown, Vinnie LoDestro, John Boruch, Leo Sadinsky, Dick Witkover. Standing, rear, Ron Clipperton, Jim Alessi, Bob Horton, John Scheblein, Joe Tuozzolo, Joe Zebuda, Gill DeGregory, Ron Weider, Dan Lehn, and Theo Sluyters.



The wavy tips of an RFQ vane can be seen in this photograph by Al Pinto, Central Shops, after the vane was milled in the heavy machine shop.

Shops (Cont'd)

length of a vane, one would see the crests of the waves at varying heights, which affect the focusing and bunching of the particles.

Last summer, two practice vanes were made out of cheaper aluminum. Then the final machining of the four steel vanes was done.

Quality-control inspectors in Central Shops checked the vanes against a computer printout and gave their stamp of approval. When the RFQ ran so successfully last week, it was more confirmation of a job well done by the Central Shops Division. — M.S.R.

Let There Be Light

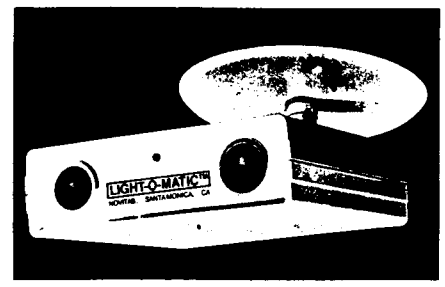
By the end of September, the Research Library and its "Stage II" Annex will have new motion-sensing light switches and other lighting improvements installed to save about $12,700 and 110,000 kilowatt hours per year, and provide better lighting. Fifty incandescent fixtures and standard switches will be removed, and replaced with fluorescent fixtures, motion sensors, and time switches at a cost of $31,468. The payback period for upgrading the lighting quality, reducing maintenance, and increasing energy savings is a little more than three years.

"The library is open over 50 hours per week at night and on the weekend in addition to 40 hours during the work week. For those additional hours, most of the library does not have to be lit until a person enters, and uses the journals and books," explains Kenneth Ryan, manager of the Technical Information Division. "During regular hours, the lights in the aisles and stacks don't need to be on unless a user is there."

Though the quantity of electricity used for lighting was high, Ryan felt that the quality of the lighting was low. "The annex has sporadic use in the day, but its lights are constantly on, and it still has very poor light distribution. Because the nine 500 watt fixtures hang so high above the main stacks, they provide insufficient lighting. The lobby and the balcony of the annex, both of which have stack areas, are even more grossly underlit."

Last spring, Ryan asked the energy conservation group of Plant Engineering to investigate lighting modifications for Buildings 477 and 184. Mark Culp, project engineer in Plant Engineering, proposed modifications including the installation of ultrasonic lighting controls for the stack areas in both buildings. These devices reduce lighting expenses by turning off the lights automatically whenever a room is unoccupied.

The sensor recognizes motion, such as the turning of pages in a book, within a 350 square foot area, and transmits a pulse to a relay which turns the lights on. If no motion occurs within a preset time, adjustable from one to twelve minutes, the lights are switched off. Light is always provided when someone is present, but always turned off when the last person leaves. "Using the motion sensors, scientists who want to use the library at night



No more stumbling in the dark for library users when the new light sensors go into action this fall.

won't have to hunt for the light switches," says Culp.

According to Abass Wessen, design engineer in the electrical group of Plant Engineering who specified the lighting, 47 sensors will be installed in the main library, and seven in the annex. Four timers will replace regular switches in the movable stack area of the library, and 12 timers will be placed in the annex. The front entrances of the library and the annex will be lit with 50 watt high pressure sodium fixtures instead of incandescent lights. A high pressure sodium lamp lasts at least 24,000 hours (32 times as long as an incandescent one), and saves $123 in energy costs over its duration.

In the main library, the 14 incandescent spot lamps hanging over the long abstract reference tables will be replaced with two 24 foot fluorescent fixtures for uniform light distribution. Forty-eight 50 watt reflector-type incandescent lamps in recessed fixtures will take the place of 150 watt standard incandescent ones.

In the annex, twenty fluorescent strip fixtures suspended from supports attached to the stack shelving will be substituted for the incandescent lamps hanging from the high bay. Nine 2-lamp fluorescent fixtures will be installed in the annex first floor and balcony, each fixture replacing three 60 watt incandescent ones. And the annex staircase will be lit with an 11 watt fluorescent fixture instead of the present 60 watt incandescent one.

The library lighting is part of a $94,879 project for general lighting improvement. On Yale Road, wooden street light poles will be replaced with 25 foot aluminum ones. Ten foot aluminum poles with 70 watt high pressure sodium lamps will be installed in the apartment area. Seventy-five high pressure sodium lights will supplant less efficient mercury vapor ones all around the site. —Marsha Belford

Service Awards

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

Thirty-Five Years

Lester M. Corliss ..... Chemistry
Richard L. Fuka ... Photo. & Gra. Arts
Raymond J. Heus ..... Applied Science
Raymond W. Stoenner ..... Chemistry

Thirty Years

John W. Bittner ..... Light Source
John J. Grisoli ..... Accelerator

Twenty-Five Years

Leonard S. Bacelli ..... Plant Eng.
Donald P. Brown ..... Accelerator
John Connelly ..... Plant Eng.
Jean C. Lauer .... Mgmt. Info. Systems
Grant Mayo ..... Plant Eng.

Twenty Years

Carolyn F. Albert ..... Physics
Vincent J. Bilms ..... Fiscal
Frank L. DeRosa ..... Plant Eng.
Hermann G. Geist ..... Plant Eng.
Robert E. Lockey ..... Accelerator
Emil A. Pluss ..... Plant Eng.
Stanley C. Rhodes ..... S.&E. Services

Ten Years

Ashok K. Agrawal .... Nuclear Energy
Alfred J. Cordero ..... Plant Eng.
Mary E. DaCosta ..... Technical Info.
Mary S. Davis ..... Nuclear Energy
Joan H. Glasmann ..... Applied Math.
Linda E. King ..... Plant Eng.
Sylvia Mouzakes ..... Staff Services
John P. Stone ..... Medical

BERA Candidates

The meeting of the BERA Nominating Committee held last week resulted in the selection of the following slate of candidates for the 1984 BERA Board Election: Richard Adams, Reactor; John Connelly, Plant Engineering; Mary Durham, DOE; and Edwin Taylor, Applied Mathematics.

Voting to elect two of the four candidates to serve three-year terms on the BERA Executive Board will begin on Monday, March 19 and extend through Friday, March 23.

Arrivals & Departures

Arrivals

Donna A. Cunningham ..... S&M
Mary L. Daum ..... DAS
James R. DeSantis ..... Plant Eng.
Frank E. Short ..... NSLS

Departures

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

Vincent J. Costanzo Jr. ... S&E Svcs.
William A. Rogers ..... Contr. & Proc.
Elliott N. Shaw ..... Biology
Georgette F. Smith ..... Tech. Info.
Claire M. Spettell ..... DNE

Stony Brook Events

Feb. 27 7 & 9 p.m.	"Grete Minde," a 1976 film in German by Heidi Genee with English subtitles. Stony Brook Union Auditorium.
Feb. 29 8 p.m.	Stony Brook University Concert Band, Jack Kreiselman, director, Ralph Hermann, guest artist. Main Theatre, Fine Arts Center. Tickets $5.
Feb. 29 Mar. 1,2,3 8 p.m.	"The Dutchman" a play written by Africana Studies. Theatre III, Fine Arts Center. Tickets $3.
Mar. 1 8 p.m.	Lecture on "The Soviet Union's Hostile World," George Toumanoff, VP, Radar & Navigation Systems, Ail Div., Eaton Corp. Arms Control, Disarmament & Peace Studies Resource Center, Old Chem. Bldg. Free.
Mar. 1,2,3 8 p.m.	University Theatre presents Moss Hart's "Light Up The Sky." Theatre II, Fine Arts Center, Tickets $5.

Diners Note

The cafeteria will be closed on Saturday, February 25. On that day, snack bar service will be available from 9 a.m. to 2 p.m. at the Brookhaven Center.

Quartet in Concert

The Herrick Quartet was founded in 1972 by flutist John Herrick Littlefield, who brought together the combination of flute, violin, viola and cello. On Friday, March 9, the quartet will perform in Berkner Hall at 8:30 p.m.

The musicians have a diverse repertoire of quartets and string trios spanning three centuries. On the March 9 program is Haydn's "Quinten" Quartet in D Minor, Op. 76, No. 2; Beethoven's Trio in C Minor, Op. 9, No. 3; Three Preludes on Welsh Hymn Tunes, a quartet by Vaughn Williams; and Mozart's Quartet in A Major, K. 298.

The concert is open to the public and tickets are available at the door. General admission is $7; students and senior citizens, $3; and those under 18, $3.

CREF Values

February	$58.93	March	$60.75
April	65.12	May	65.07
June	67.12	July	65.43
August	66.13	September	67.02
October	65.95	November	67.06
December	66.84		

January $66.50

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Winner's Circle

Tom Muller, engineer with the Accelerator Department, received a $25 energy savings award. His suggestion brought an energy loss problem to the attention of Plant Engineering's energy conservation staff. As a result of this idea, re-insulation of steam lines in Bldg. 820 and 820A will be added to the list of insulation projects.

Fiesta! Baile! Salsa!

The Hispanic-American Society invites you, your family and friends to our open house. The date is Friday, March 2, from 5:15 p.m. to 10 p.m. We'll have a variety of delicious Spanish dishes made by our members; dancing to a DJ; and a cash bar offering beer, wine and soda. There is no admission charge.

Come meet us and share with us what promises to be a delightful evening. For more information call any one of the following: Jose Medina, Ext. 7636, Jose Sanchez, Ext. 7765, or Lucy Sanchez, Ext. 4399.

Aviation Club

The Flying Club will host an Aviation Safety Seminar on Wednesday, February 29, at Berkner Hall, beginning at 7 p.m. Subjects to be covered include Flying to Atlantic City, Responding to Your Attitude Indicator, and Traffic Mix at Brookhaven Airport. Anyone interested in flying is welcome.

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to New York City on Wednesday, March 7. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare for adults is $5.00; children under five years ride free.

Reserve a ticket by sending your fare through the U.S. mail to BNL, P.O. Box 322, Upton, New York 11973. Please do not send cash. Checks or money orders, payable to BNL, must be received by Thursday, March 1. Put the date of the trip, your BNL life number and your phone number on the back of your check or money order. Your tickets will be given to you at the railroad station on the day of the trip. Refunds will be made only if cancellations are received by the Monday morning preceding the trip.

IBEW Meeting

Local 2230, I.B.E.W. will hold its regular monthly meeting on Monday, February 27, at 6 p.m. in the Knights of Columbus Hall, Railroad Ave., Patchogue. There will also be an afternoon meeting at 2 p.m. for shift workers in the Union office at 31 Oak Street, Patchogue. On the agenda will be regular business, committee reports and the president's report.

Why Leap Year?

Thirty days hath September,
April, June, and November;
February has twenty-eight alone,
All the rest have thirty-one;
Excepting leap year — that's the time
When February's days are twenty-nine.

Next Wednesday is the 29th day of February, the additional day inserted into the calendar once every four years with the exception of centennial years not divisible by 400. According to Cesar Sastre, DNE, president of the BNL Astronomy Society, this present day formula for determining leap years is part of the calendar system established in 1582 by Pope Gregory XII. Using the advice of Jesuit astronomer Christopher Clavius, Gregory reconciled the difference between the common year of 365 days, and the 365.242199 mean solar days in an astronomical year, the time it takes the earth to make one revolution about the sun.

The Gregorian calendar replaced the Julian calendar, established by Julius Caesar in the first century BC, because Caesar's year of 365.25 days was too long. The Julian calendar had become out of phase with the seasons by about 10 days over the 1600 years it was in use. "When the Gregorian calendar went into effect, October 5 became October 15," explains Sastre. "Peasants in countries that adopted the new calendar rioted because they thought that they were losing days of their lives."

Because of the differences between the Christian and non-Christian worlds, the split between Roman Catholics and Protestants, and the division between the Eastern Orthodox and Western Roman Catholic churches, the Gregorian calendar was not adopted everywhere. When the Pope issued his papal bull on the Gregorian calendar in 1582, Italy immediately embraced it. Britain and its colonies switched in 1752. Germany fully accepted it in 1776. Japan began using it in 1873, and Russia in 1918. Saudi Arabia has never sanctioned this calendar.

The Saudis rely upon the Muslim calendar, a lunar calendar having a year of 354 or 355 days, and 12 lunar months of 29 or 30 days. The months do not keep the same relationship to the seasons, and regress every 32 1/2 years. The Jewish calendar is lunisolar: the year is based on the earth's revolution about the sun, and the months are based on the full cycle of phases of the moon. Because a solar year is longer than 12 lunar months by about 11 days, a thirteenth month of 30 days is added in the 3rd, 6th, 8th, 11th, 14th, 17th, and 19th years of a 19 year cycle.

Lunar months are not suitable for determining the seasons, since these are solar phenomenon. A solar calendar is necessary to keep dates in step with the seasons. To create a relationship between the incompatible 365.242199 days in a solar year, and the 29 1/2 days in a lunar month, extra days are inserted into the calendar. As a result, a great difference between the months and the moon's phases occurs. To reconcile this difference, the ancient Egyptians operated with three calendars, one for civil, one for religious, and one for agricultural purposes. From the Egyptian calendar, the Romans created the Julian calendar from which the Gregorian calendar was developed.

Since Greogory rounded off the 365.242199 days per year to 365.2422, the Gregorian calendar had accumulated an error of less than half a minute over 400 years. To account for that error, and the fact that the earth does not rotate around the sun at a constant rate, leap seconds have been introduced in addition to leap years.

If you wish to observe celestial bodies to chart your own calendar, join the BNL Astronomy Society in spring at sunset on any Friday when the moon isn't full by the ecology field near the eastern boundary of the site. There, under the dome of its observatory, you can look through the eight-inch Newtonian telescope. To join the Astronomy Society, which sponsors lectures, publishes a newsletter, and offers instruction to novice star gazers and camaraderie for "professional" amateur astronomers, contact Sastre at extension 4077.

"George, don't get involved!"

Off-Broadway at BNL

Tickets for "Sizwe Bansi is Dead," a one act play about a black man's struggle to survive within South Africa's apartheid system, by Athol Fugard, playwright of two Broadway hits, are on sale for the Saturday, February 25, eight p.m. performance in Berkner Hall by the Adelphia Repertory Touring Company of Philadelphia. Tickets are $5 per person, and may be purchased in advance at the BERA Sales Office in Berkner Hall, from Kay Hunt in Personnel, and at the Affirmative Action Office. The evening of the show, tickets may be bought at the door. The one and a half hour, one act drama is presented by the Afro-American Culture Club as the final event of Black History Month at BNL.

Talk on Vitamins

Fred Usack, the initiator of the Nutrition Group at BNL, will speak about vitamins and their effect on our systems, in a talk sponsored by the Aerobic Dance Club. Everyone interested is invited to this talk which will be given on February 27 at 5:15 p.m. in the Hamilton Seminar Room, Chemistry Department, Bldg. 555. For more information, call Lizzy Soenarjati at 878-9520.

Quilting Club

The Quilting Club will meet on Tuesday, February 28 from 9:30 - 11:30 a.m. in the lobby of the Brookhaven Center. The morning's project will be the pieced "Basket" pattern. Bring sewing tools and some fabric scraps. New members are always welcome. For more information call Bernie Benz, 928-1068.

Bowling

Scotch Doubles Tournament

Applications are still available at the BERA Sales Office for the Scotch Doubles being held March 4 at 2 p.m. at the Port Jeff Bowl.

Red League

High games were bowled by K. Riker 236, K. Asselta 225, R. Larsen 216, G. Meinken 208, T. Prach 207, J. Medaris 203.

White League

P. Manzella rolled a 214, J. Griffin 214, V. Manzella 202, J. Pinelli 199, M-G Meier 189/187, R. Sheehan 186, M. Scheidet 185.

Cafeteria Menu

Week Ending March 2

Monday, February 27		
Spinach egg drop soup	(cup)	.65
	(bowl)	.75
Beef liver & onions w/1 veg.		1.80
Chili on rice		1.90
Hot Deli: Knockwurst & sauerkraut	(bread)	1.85
	(roll)	2.00
Tuesday, February 28		
Minestrone soup	(cup)	.65
	(bowl)	.75
Pot roast & 1 veg.		2.05
Quiche Lorraine & 1 veg.		1.85
Hot Deli: Chicken patty club	(bread)	2.15
	(roll)	2.30
Wednesday, February 29		
French onion soup w/croutons	(cup)	.65
	(bowl)	.75
Barbequed spare ribs & 1 veg.		1.95
Old fashioned beef stew on noodles		1.95
Hot Deli: Sandwich steak w/ peppers & onions	(bread)	1.95
	(roll)	2.10
Thursday, March 1		
Cream of mushroom soup	(cup)	.65
	(bowl)	.75
Sauteed chicken breasts on rice		2.10
Spaghetti & sausages		2.00
Hot Deli: Monte Cristo		1.90
Friday, March 2		
Manhattan clam chowder	(cup)	.65
	(bowl)	.75
Broiled fish filet & 1 veg.		1.80
Beef hash & 1 veg.		1.85
Hot Deli: Barbequed fresh ham	(bread)	1.85
	(roll)	2.00

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, 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 Personnel Placement Supervisor, Ext. 2882.

SCIENTIFIC POSITIONS OPEN: The following staff positions are open. Candidates may apply directly to the department representative named, or through the office of Scientific Personnel, Ext. 3338.

SOCIAL SCIENTIST - Ph. D.-level, to perform analysis of psychological, sociological and organizational factors which contribute to human behavior and performance in nuclear power plant environments. Contact: R.A. Bari, Ext. 2629.

LABORATORY RECRUITMENT: Opportunities for present Laboratory employees.

2018. SECRETARIAL POSITION - Requires an AAS degree in secretarial science or equivalent appropriate experience. Will be responsible for providing diverse secretarial support functions within the division. Excellent clerical, organizational and interpersonal skills are essential. Personnel Division.

2019.RESEARCH SERVICES ASSISTANT - Requires an AAS degree in an agricultural or related field or equivalent experience. Will be involved in greenhouse and field operations. Must be able to work weekends and holidays. Biology Department.

2020. DEPARTMENT ENGINEERING COORDINATOR - Requires an advanced degree in mechanical engineering or equivalent and a minimum of ten years' experience in the following areas: design, development and construction of large and small experimental structures used for high energy, nuclear and solid state physics research; coordination of planning and utilization of engineering and technical resources; coordination of planning, budgeting and scheduling of experimental equipment projects; management of design review and quality assurance; coordination of departmental safety practices and procedures. This individual will report to the chairman of the department. Physics Department.

2021. MECHANICAL ENGINEER - Requires a BSME degree and a minimum of 5 years' experience with vacuum and cryogenic systems. Individual will provide experimental facility support in Research Coordination Group at the HFBR. Primary duties will involve operating support for Cold Neutron Facility and general engineering support for experimental equipment at the HFBR. Reactor Division.

OPEN RECRUITMENT: Opportunities for Laboratory employees and outside applicants.

2022. CLERICAL POSITION - Requires AAS degree in secretarial science or equivalent and excellent communication and clerical skills. Familiarity with library procedures and practices desirable. Previous experience in OCLC database searching very desirable. Will work in the Technical Services section of the Research Library. Technical Information Division.

2023. TECHNICAL POSITION - Requires an AAS degree in electrical technology or equivalent and a minimum of 5 years' experience with analog and digital circuits. Thorough knowledge of construction, diagnostic and modification techniques, as well as proficiency using a wide range of test equipment, is necessary. Accelerator Department.

Autos & Auto Supplies

82 TOYOTA - 4 x 4 SR 5 long bed pick-up, 15,700 mi., loaded, $7,990. Russ, 928-1209 after 6 p.m.

GERMAN AUTO PARTS - wholesale prices on new parts for VW, Porsche, Audi, BMW, and MB. Augie, 289-4211.

CAR TOP CARRIER - Sears X-Car-Go, never used, $80. Al, Ext. 2075 or 281-6617 eves.

68 PLYMOUTH VALIANT - 6 cyl., 3 spd., standard, 4 dr., sedan, good cond., $425. 924-8224 eves.

72 BEETLE - $500. Ext. 4673 or 744-7906.

74 MERCURY MONTEGO - high mileage, best offer. Bea, Ext. 3571 or 732-2472.

69 VOLVO - model 164, 4 dr., good 74 engine, some rebuilt parts, running cond., $450. Dan, 249-0402, 8-10 p.m.

71 DODGE DART - 4 dr., p/s, p/b, a/c, new battery, starter, belts, excel. cond., $850. Ext. 4260.

75 HARLEY DAVIDSON SPORTSTER - black, chromed, custom wheels, seat, etc., $2,000. Ext. 2309 or 473-9180 after 4 p.m.

80 SUZUKI TOURING BIKE - GS1000 CC, full fairing and lowers, saddle bags and other extras. Dan, 277-1284.

70 VW - runs well, $350. 286-1899 after 5 p.m.

74 TOYOTA CELICA - 5 spd., excel. running cond., needs body work, $750. 727-1667.

74 HOND MOTORCYLE - 750 CC, black, $800. Ext. 2021 or 283-0457.

GLASS BELTED SNOW TIRE - 7.50-14 (F78-14) on Pontiac rim, good cond., $7. Morris, Ext. 4986.

81 DODGE - 024, 4 spd., am/fm cassette, 50K, 30 mpg, good running cond., $3,200. Al, Ext. 3302.

75 BUICK - S.W., $650. Ext. 7110.

78 TOYOTA COROLLA - liftback, a/t, am/fm cassette, high mileage, factory maintained, $2,295. Pat, Ext. 4628.

72 PLYMOUTH FURY - auto., p/s, p/b, a/c, am/fm, snows, needs work, $150. 744-8292.

77 DODGE COLT - wagon 71,673 mi., 8,000 on rebuilt engine, new muffler system, asking $2,500. 589-5126.

76 CHRYSLER NY - Brohm, every known extra, good cond., $1,600. 928-4487.

69 MUSTANG CONVERTIBLE GT - 4 spd., p/b, p/s, many extras, $3,200. Ext. 3803 or 467-1090.

74 MERC MONTEGO - 9 pass. wagon, p/s, p/b, a/c, roof rack, $700. 928-4487.

76 SUZUKI GT 550-ram air system, w/backrack & windshield, $550. 289-1705.

75 DODGE DART SPORT - 340 ci, 4 spd., Cragers, Dunlop radials, new clutch, stereo, asking $1,700. 732-7288.

68 CORVETTE - black, T-roof. Tom, 475-6271, eves; KX80 motorcycle, $425. Bill, 286-9700.

78 OLDS OMEGA - 2 dr., bucket seats, 4 spd., V8, am/fm stereo, 62,000 miles. Jim, Ext. 5025 or 821-1704, eves.

79 DODGE DART 318 - p/s, p/b, a/c, 2 door, runs well, $650. 281-7578

CHROME BUMPERS - front and rear for 1980 and later Dodge or Plymouth van, $100. 924-8224.

DATSUN - 200SX, auto., a/c, p/s, am/fm, 30K miles. $5,750. 924-4857.

72 VW SQUAREBACK - good transportation, $750. Ext. 4363 or 286-1183 or 924-7238.

65 MUSTANG FASTBACK - parts for sale. Michelle, Ext. 3304.

72 DODGE SWINGER - 318 V8, p/s, auto., body interior excellent, needs engine work, $250. 924-8224.

80 FORD FAIRMONT WAGON - 6 cyl., p/b, p/s, runs well, low mileage, $2,695. 821-9280.

82 MOTORCYCLE - XR200R, new rear tire, new sprockets. Bill, Ext. 7145 or 286-9700.

82 DODGE RAM PICK-UP - with cap, standard shift, am/fm casette, 5 yr-50,000 mile warranty, $6,000. 331-1572.

82 KAWASAKI 440 - blue belt drive, like new, $1,400. Richard, 924-3476 after 6 p.m.

71 DART - good mpg, 74 motor, trans., very good cond., $800. 363-7431.

63 CHEVY BELAIR - 2 dr., good running cond., new tires, clutch, battery, $400. John, Ext. 3292 or Mark, 286-4150.

77 FORD TRUCK - needs motor; roll bar, push bar, white rims, radials, new brakes, clutch, no rust, $1,850. Eddie, Ext. 2021.

74 CORVAN - VW bus, warranted Corvair engine, new radials, clutch, p/b, am/fm cassette stereo. Rich, Ext. 2965 or 744-0960.

79 SUBARU WAGON DL - 4 cyl., 5 spd., std., good cond., $1,955. 298-9682 eves.

74 TOYOTA COROLLA - dependable, economical car, $600. 669-9234 after 6 p.m.

73 DUSTER - V8, manual, runs well, $1,600. Doug, Ext. 4095.

76 FURY - fair cond., runs well, good interior, a/c, p/b, p/s, auto., $700. Erik, 281-5565.

TIRES - with rims, A78-13, Goodyear, excel. cond., $25 pair. Ext. 5271.

74 VOLKSWAGEN SUPER BEETLE - 4 spd., gold, sunroof, good cond., $1,100 firm. 654-1250 after 6 p.m.

SHOCK ABSORBERS - Sears heavy duty, rear, for 1965 Dodge Dart, sealed carton, $6 ea. Morris, Ext. 4986.

SERVICE MANUAL AND WIRING DIAGRAMS - for 1977 Chevrolets, both for $8. Tony, Ext. 7214.

81 HORIZON - Ext. 4360 or 689-9644 after 5 p.m.

68-72 NOVA PARTS - hit in rear, front end and other parts available. Glenn, Ext. 5385 or 281-7873.

80 DODGE RAM - pick-up, slant-6, cap, low mileage, like new, $5,100 or best offer. 234-9630.

73 CHEVY - pick-up, 4 w/d, $1,000. Tom, Ext. 4581 or 924-4373.

73 OLDS DELTA - 98 Royal, p/s, p/b, a/c, $700 or best offer. 929-6543 after 5 p.m.

Boats & Marine Supplies

21' PENN-YAN WEEKENDER - fiberglass, 225 HP, Chrysler, new navy top and curtains, cabin has two full bunks, $6,300.Bill, 281-0557.

CLAM RAKE - 18 tooth, alum., "T" handle, $35; Bill, Ext. 2807 or 281-0557.

Miscellaneous

FISHER STEREO - w/speakers, am/fm, 8-track, excel. cond., $90. Carol, Ext. 2896 or 475-7454 eves.

COLONIAL SET - sofa and matching chair, earth tones, excel cond., $350. Deb, 286-4652 after 6 p.m.

RECLINER - brown tweed Herculon, like new, $125. Karen, Ext. 2950.

POT BELLY STOVE - antique, cast iron, burns coal or wood, excel. cond., $100. 924-8224 eves.

REFRIGERATOR - Hoover, 10 cu. ft., $25. Bob, Ext. 4758.

DRESSER AND HEADBOARD - for young child, white, $50 and $20. Les, Ext. 2920.

SHOE RACK STAND - chrome, holds 9 pr. of shoes, new cond., $4. 727-3608 after 5 p.m.

MICROWAVE OVEN - Magic Chef, 1.2 cu. ft., $50. John, Ext. 5152 or 281-2471.

SALTON YOGURT MAKER - $6. 929-3566.

TWIN BEDS - large bureau, student desk, night table, bookcase and access. 475-6717 after 8 p.m.

CHILTON REPAIR MANUAL - for Datsun Z&ZX, 1970-82, cost $20, sell for $15. Ext. 2309 or 473-9180 after 4 p.m.

NATIONAL GEOGRAPHIC - 15 yr. supply, complete 12 mo. sets intact, best offer. 475-6717 after 8 p.m.

SINK - marbleized, blk/gold, 22½"D, 36"L; cabinet same 31"H, 35"L, 21½D, new, $150. Lola, Ext. 2265.

PANASONIC CASSETTE RECORDER - model RQ-409S, built in mike and handle, excel. cond., $30. Oster, Ext. 3876 or 4822.

RACING HANDLE BAR - chrome, ram style, for 10 spd., new cond., $2. 727-3608 after 5 p.m.

BOX SPRING & MATTRESS - polyfoam, single bed, $40; Time-Life Swing albums w/text; Honeywell thermostat; Chevette emergency tire on wheel; 4 winter coats, sz. 10-12. Claire, 281-2002.

SKIIS - Hart, 170 cm, Cobia bindings, men's boots, 10-1/2, polls, straps, good cond., $65. 924-8224.

ELECTRONIC FLASH - auto flash with thyristor, circuit end zoom/bounce head, comes with wide-angle and multi-color filters, $25. Ext. 4153 or 732-5829.

REFRIGERATOR - Frigidare, 6 ft. high, 12 cu. ft. capacity, freezer, complete, $150. Roy, Ext. 4664 or 331-2401.

35 MM KODAK 35 CAMERA - w/case, excel cond., $15. Morris, Ext. 4986.

PIANO - upright, woodgrain finish, reflected strikers. 281-0360 after 6 p.m.

TYPEWRITER - Smith-Corona, cartridge, portable, cartridges included, $185 firm. 654-3929.

SOUND MOVIE CAMERA - and projector, Bell and Howell; Sears sewing machine w/cabinet; bar with stools, 6' wide, lg. storage area. Ext. 2231.

BEDROOM SET - used, maple, 3 drawer dresser and 4 draw chest, double bed, $100. 281-9412.

VICTORIAN BEDS - $1,200; Oriental rug, 8 x 10, $1,800; chair w/ottoman, $400; love seat and chair, $1,000. 472-0509.

BUTCHER BLOCK TABLE - rectang., mica, with 4 tuffed vinyl chairs, perfect cond., $200. Marilyn, 467-6171.

AMP - Hohnor, 80 watts, preamp reverb, 12" speaker, excel. cond., $225. Jake, Ext. 4532.

WINDOW BLINDS - verticals, mini's, wovenwoods, custom colors and sizes. Jim Griffin, 281-2849.

WET SUIT JACKETS - mens and ladies small, excel. cond., $30 ea., Naomi, Ext. 3699 or 744-1081.

WROUGHT IRON RAILINGS - (2) for 2 step stoop, $30; 55 gal. drum, $5. 744-9832.

REFRIGERATOR - Sanyo, dorm size, $60. Jake, Ext. 4532.

SERTA BED - extra long, extra firm, box spring and frame, $65. 473-3604

SOFA - green velvet brocade, $50; 17 x 12 multi-brown, striped rug, $50; upright vacuum, $50. 289-8212.

VIC 20 - ref. manuals, memory, 4 game cartridges, 8 tapes, $130. Ext. 4255.

UTILITY TRAILER - heavy duty, asking $375. 234-9630.

SLIDING GLASS DOORS - used, 6', single or thermo pane. Murdock, Ext. 5109.

DRAPES - lined, cotton, gold, 2 pair, for double windows, $100 new, asking $50. Ext. 4602 or 722-4489.

PING PONG TABLE - 5 x 9, fold away, excel. cond., $60., 924-3476 after 5 p.m.

OAK LUMBER - mostly 2 x 4, some 2 x 6, mill cut, unplaned, cured 25 + yrs., excel. for furniture/decks, etc., $1.50 running ft. or best offer. Adam, Ext. 5213.

TICKETS - (2) Stuttgart Chamber Orch., SUNY, Stony Brook, March 10, 4th row center, $10 each. Dave, Ext. 2694 or 941-9022.

ORGAN - Thomas, color glow automatic, double keyboard, $700. Jean, 234-7225.

WURLITZER ORGAN - double keyboard, mint cond. 821-0080 after 5 p.m.

DISHWASHER - Sears, undercounter, coppertone, excel. cond., $75. 924-7454.

SKI BOOTS - men's size 14, woman's size 8, binders, poles, carriers, brand new, $100 each set. Walt C., Ext. 5316 or 325-0567.

HUTCH - 2 piece, dark pine, Early American, $450; 5 light Early American chandelier, blue floral pattern globes, $20. Ext. 2023 or 422-1038.

MOVIE PROJECTOR - Honeywell FP8-C, 8mm, super 8mm, new lamp. $50; Airequipt 135 slide projector, 5 trays, 1 rotary magazine, $50. Bob, Ext. 4434.

MUSIC STAND - Norwood, folding, $10. Morris, Ext. 4986.

MAPLE CHEST - 36"h 26"w 16"deep, $20; 3 storage metal shelves, $20 for all; 6 qt. cast iron pot, $28. 878-6637.

CALCULATOR - TI58C, programmable, 480 steps, constant memory, library module, optional software, $40. Ext. 3242 or 7192.

STEREO CONSOLE - Sears, am/fm, 8 track, player and recorder, record player, excel. cond., $75. 924-0277.

PING PONG TABLE - $40, large sofa, blue, good cond., $40. 929-4268.

ELECTRIC GUITAR - Cortez, solid body, Les Paul style, gold, excel. cond., $150. Jake, Ext. 4532.

TRANCEIVER - ham operator's, HW16, VFO, antenna tuner, SWR meter, coax switch, $200. Oster, 589-2648.

OAK SERVER - antique, with mirror, $250; mahogany slant top desk, $275. JoAnn, 286-0745.

CRAFTSMAN SAW - radial arm, 3 HP, 10", hold down clamps, rotary planer, $150. Bob, Ext. 4434.

EASTER BUNNIES - choice of colors, $10. 363-6292 eves. & weekends.

SIGNOR CAPUCCINO - 12 cup size, $60; juicer, $15; popcorn maker, $15, used few times. Ext. 3701.

Car Pools

STONY BROOK - individual wishes to join or start pool. Ext. 2060.

RONKONKOMA - 2 drivers to join existing pool near LIE Exit 59, 8:30 to 5 p.m. Victor, Ext. 2395.

MASSAPEQUA/FARMINGDALE - points west, leave vicinity Exit 32 Southern State Parkway. Plotkin, Ext. 4717.

QUEENS - driver wishes to join existing carpool. Robert, Ext. 7772.

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

SETAUKET - 3 rm. apt. brand new. 473-6432.

PATCHOGUE VILLAGE - 3 rm. apartment, upstairs, mature working person, $400 plus elec. 475-9033.

WADING RIVER - 2 bdrm. ranch, fully furnished, across from beach. Ext. 3397.

N. SHIRLEY. - attractive studio, furnished, private entrance, utilities included, 5 min. from Lab and stores, single working person, security, $350 pays all. 281-8044.

EASTHAM, CAPE COD - June-Sept., 4 bdrm. house, sleeps 8, 2 baths, washer-dryer, dishwasher, deck, near beaches, $575/week. 722-3865 eves. & weekends.

WADING RIVER - available March 15th, one bdrm. apt., walk to beach. $400/mo. incl. util. 929-6543 after 5 p.m.

N. PATCHOGUE - one bdrm., w/w, kitchen, bath, cable hook-up, private ent., deck, $425/single, $450/couple, no pets or children. Carol, 289-3917 eves.

RIDGE - house to share, appliances, washer/dryer, lake privileges, furnished, immediate occupancy, $300/mo. + security, single, nonsmoker, working person, preferred. 929-4789 after 4 p.m.

Wanted

SITTER - in Port Jefferson home for 6 year old girl, Wed., Thur., Fri., 8:30 a.m. to 12:30 p.m. starting March 1. 331-9771.

WASHING MACHINE - reasonable price. 286-1557.

MINERALS - mineral collections, mineral literature, any language. Plotkin, Ext. 4717.

TO RENT - 2 bdrm. apt./house, close to Lab, reasonable. Ext. 2272 or 3925.

BABYSITTER - Stony Brook, prefer near M section, for 2 month old, 3 days/ 2 wks., experienced preferred. Ext. 7505 or 689-8605.

ROOMMATE - large 4 bdrm. house, 5 min. to Lab., washer/dryer, $200 + util. Bill, Ext. 2378 or 924-3669.

TRAINS - Lionel, "0" gauge or "027" gauge cars, track, and equip.; records, 45 rpm and some LP's from the 50's and 60's. Frank, Ext. 3120.

ORGANIST - Old South Haven church, Brookhaven. Contact John Long, 286-0525.

TO RENT - quiet apt. or small house close to BNL, married couple. Ext. 7603 or 3091.

ABNER READ - Fletcher class destroyer, reunion, were you there in '44? Al Gill, 724-4514.

80 TOYOTA TERCEL - or Corolla, low mileage, 5 spd. Debbie, Ext. 3420 or 736-4280.

Lost & Found

LOST - small pinky ring, gold with turquoise center, lost in AGS complex, Friday, 2/10. Ext. 3876 or 4822.

Classified Ad Policy

Deadline is 4:30 p.m. Friday for publication Friday of the following week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's property.
3. Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
4. Ads for the sale or trade of firearms will not be accepted.
5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated. One ad per person per week.
7. **Property for sale or rent cannot be accepted on this form. Special Real Estate Ad Forms are available at the office of the Brookhaven Bulletin, Building 134.**

☐ For Sale: Autos & Auto Supplies
☐ For Sale: Boats & Marine Supplies
☐ For Sale: Miscellaneous
☐ Car Pools
☐ Wanted
☐ Free
☐ Lost & Found

Please print your ad below in 15 words or less using one word per block. Include name and phone number to call.

Note: The following must be completed for your ad to appear.

NAME (Please Print) .....

Employee's Signature ..... Life No. ..... Ext. .....

Send to: Brookhaven Bulletin, Building 134 (Ext. 2345).

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