

The front end chambers of X-13 (front) and X-14 (rear).

Alex Rubin

New Project to Study Radiation Effects

The current estimate of BNL's total budget for FY85 is \$245 million. One item of approximately \$3 million in this budget was the subject of a story in *The New York Times* on November 18. Referred to as the "Star Wars" contract by the Times, funding comes from the Department of Defense and will be used to build a beam line at the Linac for a new irradiation facility. Essentially, radiation damage will be studied and the initial research will focus on the effects of proton beams on electronic circuitry.

In the eyes of some, "Star Wars" would appear to be a departure from the kind of research pursued at BNL. Not so, says Lab Director Nicholas Samios. "This in no way changes the style of the Laboratory. This research is unclassified and the area unclassified." He went on to indicate that this new project also does not entail increased security.

Indeed, funding comes from the Air Force Weapons Laboratory, the same people who do research on particle beam weapons. But the project at BNL is not to build a weapon.

As to how BNL became involved, Samios said it was in response to the President's announcement of the "Star Wars" initiative. The Lab was asked how it could contribute to this national effort, and "we chose this irradiation project which could be done at the Linac without making any change in the direction of the Lab," he said. Samios also noted that the project went through channels of approval customary for new research when larger dollar numbers are involved. It originated in the Department of Nuclear Energy, so the project was approved by that department chairman, followed by the directorate and the AUI Board of Trustees.

Says DNE Chairman Herbert Kouts, the Laboratory has a basic interest in radiation damage studies. Since cosmic rays are mostly made up of very energetic protons, knowing the effects of proton beams on electronic circuitry has applications to any work in space, from the space shuttle to voyages to Mars.

He cites a project carried out in the early 1960's at the now decommissioned Graphite Research Reactor: Transistors for the Telstar communications satellite were irradiated in the reactor, and when they failed because of radiation, a new set of transistors with higher radiation resistance was installed before the satellite was put into space. "It would have been a tragedy if the experiment had not been done," says Kouts.

Preparatory work has begun at the Linac, where a hole has been punched out at the BLIP (Brookhaven Linac Isotope Producer) tunnel for the new beam line. To date, the \$2.9 million for the construction of the irradiation facility has not been received. Construction will begin when funding is in hand, and research will start up about a year after that time.

Intermission at the NSLS

Unlike in a theater, where the house lights are brought up during intermission, the lights of the X-ray and Vacuum Ultraviolet (VUV) storage rings of the National Synchrotron Light Source (NSLS) were dimmed on September 15 and 28, respectively, for scheduled maintenance and improvement. The tasks being performed on the VUV facility will improve the ring's operation and expand the number of beam lines available. The work on the X-ray ring, and its beam ports and lines is bringing the X-ray facility closer to full operating order.

According to senior physicist Claudio Pellegrini, who is head of the NSLS accelerator physics section, since the number of requests to establish experiments on the VUV ring is increasing, all remaining beam ports are being prepared for operation, bringing the total to 16. Each port can support several beam lines. Eleven new beam lines are being hooked up to new and existing ports, which should result in a total of 24 operational beam lines in 1985. In addition, plans for eight new beam lines are being made.

During this shutdown, beam lines and front end components built by Exxon, Los Alamos National Laboratory, Oak Ridge National Laboratory and the NSLS vacuum group are being installed. As well, additional and improved equipment is being put in place on four beam lines already in use.

A lead wall is being constructed around the inside of the VUV ring to shield radiation. "The wall will enable us to go inside the ring during its operation and have access to the electric power supplies, radio frequency equipment and other apparatus kept in there," says Pellegrini.

Several important tasks are being performed to improve the vacuum system of the VUV ring. The ring's vacuum chamber and the vacuum components of the beam lines are going to be "baked-out," heated to 150° Celsius to remove gases that are weakly bonded to interior surfaces. If most of the residual gas atoms are not removed, they will knock the electrons in the storage ring out of their orbit, thereby shortening the amount of time they can emit photons.

"This bake-out is essentially the same as what we have done in the past," explains Pellegrini. "However, we are trying a slightly higher temperature and will take care to insure that all the components attain the proper temperature."

Another technique, ion-glow discharge, is being performed on the dis-

tributed vacuum pumps of the dipole magnets using argon gas. Ion-glow discharge is a way of cleaning and conditioning the pumps that has been successfully used to improve the lifetime of the electron beam of the synchrotron storage ring at the Photon Factory, a synchrotron radiation laboratory in Japan. Senior project engineer Joseph Schuchman, leader of NSLS's vacuum and engineering support group, visited the Photon Factory to learn the technique first-hand.

"We think that the combination of the bake-out and the ion-glow discharge will improve the VUV ring's vacuum, and that should improve its lifetime," says Pellegrini. "At 100 milliamperes, beam lifetime is now between two and 2-1/2 hours, but we would like to have the beam last four hours at this current. If the ion-glow discharge works for the VUV ring as we expect, then it will also be done in the X-ray ring during a future shutdown."

As the number of VUV experimental beam lines has been increased, it has been increasingly difficult to direct the electron beam so that it fully illuminates all the experiments. After a study of the alignment of the storage ring vacuum chambers and beam ports led by senior mechanical engineer Hank Hsieh, head of the NSLS engineering section, the NSLS staff has decided to extend the VUV shutdown in order to work on this operational problem. During this extended period, the vacuum chambers, ring multipole magnets and beam lines will be aligned to allow all experiments to be operated simultaneously.

On the X-ray ring during this shutdown, two main tasks are being performed: the completion of installing front end components for the beam lines, and the installation of new radio frequency (RF) systems in the ring.

The front end hardware connects the storage ring to the experimental beam lines, and consists of modified radiation shutters, vacuum protection devices, and personnel safety components. "These retrofitted front end components have new flanges and bolts, and are being mounted in a new way," explains physicist William Thomlinson, head of the NSLS experimental program support section. "While installing the front ends of the beam lines during the spring, we had a persistent vacuum leak problem," adds Thomlinson. "We couldn't open the ports then because we couldn't meet the vacuum conditions of the storage ring." (Continued on page 2)

Revised Patent Law Encourages Tech Transfer

An amendment to Public Law 96-517 (the Dole-Bayh Bill), just signed into law by the President, will allow Associated Universities Inc. (AUI) and other non-profit government contractors that operate Government owned-Contractor operated (GOCO) facilities to retain title to their own inventions. Previously, the Department of Energy (DOE) had title to all inventions made at its GOCO facilities.

Actually, the Dole-Bayh Bill, passed in 1981, already contained these provisions which were applicable to all Federal agencies who chose to apply them. At that time, DOE did not so choose. The new amendment automatically extends the provisions of the law to non-profit GOCO's and eliminates DOE's option. The only exception is with regard to weapons-related research programs.

For over a decade, Congress has been concerned with the erosion of U.S. trade and technology positions in the world. One of the areas they felt stymied technological growth was the government's patent policy, so they investigated. The Dole-Bayh Bill was the result of this investigation. Says Margaret Bogosian, BNL's Patent Counsel, "In the past, many industrial concerns lost interest in developing promising government inventions because of the cumbersome licensing procedure."

Now that title to inventions will rest with AUI, the Laboratory expects a more rapid and smooth transfer of its most promising inventions to the commercial sector. In testimony before

the Senate Judiciary Committee last summer, Jerome Hudis, Assistant Director for Scientific Staff Policy and then in charge of the technology transfer program, outlined BNL's reasons for favoring the Dole-Bayh Bill as amended. His main points were that:

- There would be closer interaction between the inventor and the interested commercial party, and, if required, additional developmental work could be begun early in the process.

- The BNL staff would have a greater incentive to push for commercialization when they could see a viable product created as a result of their efforts.

- BNL would have greater freedom in making important licensing decisions.

- Industry would now negotiate directly with AUI, which would make it possible to expedite the transfer of technology and keep it commercially competitive.

Not only the contractor, but the inventor, stands to benefit. The inventor will get personal satisfaction from seeing his invention move to the marketplace and, if financial gains are to be made, will share in the royalties.

The amended bill will go into effect on January 1, 1985. After the Department of Commerce spells out how Federal agencies are to implement the new law, the AUI Board of Trustees will draw up the procedures (Continued on page 2)

Coming Up

The 210th Brookhaven Lecture will be presented by Nuclear Engineer James Guppy on December 12 at 4:30 p.m. in Berkner Hall. He will talk about "Nuclear Power Plants: The Next Generation."

The third BERA concert will feature guitarist Sharon Isbin on December 13 at 8:30 p.m. Her program will include a lute suite by J.S. Bach, a Spanish dance by Enrique Granados, and music of Brazil and Venezuela. Tickets are \$8 for general admission; students and those over 65, \$5; under 18, \$3.

Public Sale Of Motor Vehicles

Thirty-three vehicles, located at Warehouse T-87, are available for public sale. Inspection will be permitted from December 10 to December 14 during the hours of 9 a.m. to 4 p.m., except Saturday and Sunday.

This will be an informal competitive bidding and forms may be obtained at Bldg. T-87. Bids will be opened on December 20. For further details, call Ext. 2302.

NSLS

(Continued)

"The NSLS department began an intensive effort to solve the problem," continues Thomlinson. "Our scientific and engineering staff came up with the actual solutions, and our vacuum and mechanical engineering groups are performing the retrofit and reinstallation of the hardware."

The NSLS staff worked with the Stanford Synchrotron Radiation Laboratory to change the way in which the chambers were assembled, and to improve the system for inspecting new front end components and for correcting manufacturers' mistakes.

Eleven of 15 ports of the X-ray ring of the National Synchrotron Light Source were operational before the ring was shut down, and light was seen in 22 of 29 beam lines coming off of these 11 beam ports. Radiation was brought from the storage ring, down four completed beam lines and into the experimental stations. During the shutdown, the final four beam ports are being completed, and experimenters are assembling the beam lines from the ports to their experimental stations.

The most time consuming task of this shutdown is the installation of two new RF cavities and one new power system. An RF cavity contains electromagnetic fields which transfer energy to the electrons in the ring. "Before this shutdown, the ring had one RF system with which we were able to run the ring at an energy

Service Awards

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

Thirty Years

Peter A. Montemurro Accel.
Daniel R. Oldham Reactor
Grace K. Searles DNE

Twenty-Five Years

Thomas P. Browne P.&G. Arts
Yung Yee Chu Chemistry
Ronald S. Dobert Medical
Robert J. Gibbs Accel.
Vannett D. Pfeiffer Instr.
Ernest K. Warburton Physics
Thomas Weldon Medical

Twenty Years

John J. Austen Supply & Mater.
Gilbert R. DeGregory Accel.
Peter Fennelly Plant Eng.
Carnal Hobson Plant Eng.
Patricia F. Meehan Physics
Richard S. Richard S.&E. Svcs.
James J. Roesler S.&E. Prot.
Joseph J. Zeneski Central Shops

Ten Years

Joseph Buscemi Plant Eng.
Francis J. Dacey Jr. Central Shops
Gerald Dennehy Cont. & Procure.
Hubbard Harris Jr. Plant Eng.
Norman E. Holden DNE
John R. Johnson DAS
Peter G. Kroeger DNE
Pamela Mansfield Instr.
Carol S. Ogeka S.&E. Prot.
Elizabeth L. Roche Medical
Betty J. Rollins Staff Services

of two billion electron volts [2 GeV]," says physicist Samuel Krinsky, who is in charge of commissioning the X-ray ring. "The energy was limited by the one RF system."

"During the summer, we solved problems with the RF amplifier which were limiting the amount of beam energy at which we could run," adds Krinsky. "In solving them, we gained an increased understanding of the interaction of the beam with the RF cavity and that knowledge is being used on the new units."

"The RF cavity gives energy to the electron beam," continues Krinsky, "but it is not like a radio station where you send out radio waves into free space and they never come back to bother the transmitter. An RF cavity sends energy to electrons, but the electrons give some of that energy back. Over the last few months, we've learned more about this complicated interaction."

"Having the same power in each of the two new cavities that we had previously run through one will take us to 2.4 GeV," adds Krinsky. "We knew we could not reach 2.4 GeV without the second RF system, but we only now have that system ready to install. Going from two to 2.4 GeV is a very big change with regard to the usable flux of high energy photons. The additional flux at high energies will make possible some experiments on the X-ray ring which would not have been attempted at 2 GeV."

—Marsha Belford

A Fascination With Weaving

The ancient art of weaving, from which most clothes, curtains and carpets are made, is the basis of today's automated textile industry. But in many parts of the world, weaving is still practiced as it was in days of yore, on looms in the home.

Norway is one place where "just about everybody weaves. You walk into a home and there's a loom set up. It's just a way of life." That was the observation of Eleanor Dahl, secretary in the Department of Nuclear Energy, on her first visit to Norway in 1966. While honeymooning there with her husband, physicist Per Dahl of the Advanced Development Branch of High Energy Facilities, she became so intrigued that a 26-inch wide loom accompanied the Dahls on their return flight.

Since then, Eleanor Dahl's fascination with weaving has grown, as has her loom collection. She now has five looms, ranging in width from 15 inches to 48 inches.

Though she has taught weaving and worked professionally, selling at local crafts shows and on consignment to a gallery in New York City, at the moment, her weaving has a personal focus. "I've been doing a few things for the house," she says, "but mostly, it's a baby year in the family. I'm trying to get four baby blankets made. I'm just starting to weave the first one, and what's pretty about the loom at the moment is that it's just a sea of pink, yellow and aqua, as all the threads are warped."

Warping the threads, the first step in weaving, involves stringing full lengths of fiber in parallel on the loom. Under tension, these warp threads are alternately raised or lowered, either by hand or by treadle, to create a shed. Then the weaver manually interlaces the weft, or woof, threads through the shed at right angles to the warp fibers. The final design depends on how the weft and warp threads are interwoven and what colors are used. "It's an early form of computer," says Eleanor Dahl. "You're programming the loom to create a certain design."

Also like computing, weaving can demand a sizeable investment. "The minimum," she estimates, "is \$150 to \$200 and you can go right on up to \$5,000, depending on the size of the loom." For those who would first like to find out if they are interested in weaving, she recommends renting a loom from the Paumanok Weavers Guild, a Riverhead-based group of about 60 Long Island weavers, which also offers courses for beginners, as well as more advanced courses focusing on various designs.

Most of Eleanor Dahl's designs reflect "pretty typical Norwegian patterns" as interpreted in rugs and wall hangings. For example, she might use a Krokbragd (crooked path) motif in a flat wall hanging. For a warm, thick wall hanging or floor rug, however, she might use rya knots, which is a technique that has been used since the third or fourth centuries A.D. "One of the original uses of the rya rugs was to cover fishing boats," she explains. "Since the rugs were made of natural fleece, they were water repellent. They were also used on the walls as insulation in the home."

Some of the rugs that adorn the walls of the Dahl's home in Brookhaven are the result of a collaborative effort, where Per helped Eleanor with the design. "I gave him my concept," she says, "and he worked out the colors and design, then he did the sketch from which I wove the rug."

Interspersed with Eleanor's woven wall hangings, which tend towards the abstract, are Per's realistic oil paintings and pen and ink scenes of such locales as Venice, Moscow and their own backyard. And dominating



Roger Stoutenburgh

Eleanor Dahl demonstrates weaving techniques at the Hospitality Committee's Fall Tea & Sherry Party on November 15. To emphasize the theme of "Wearable Art," party attendees sported such hand-crafted attire as a woven cocoon jacket, kimonos, crocheted shawls and skirts.

a separate room is a six-foot-long, scale replica of the U.S.S. Constitution. To date, Per Dahl has put in over 4,000 hours building this model, which is complete in detail right down to the Captain's cabin. Sharing quarters with that ship is a model of the Victory, commanded by Lord Nelson at Trafalgar. Though the Victory was actually a much larger vessel, with a crew of about 900 compared to the Constitution's 450, the replica was constructed on a much smaller scale.

Since 1966, the Dahls have displayed their work at various employees' art shows and crafts exhibits run by the BERA Art Committee. They have also been actively involved with the committee, serving as co-chairmen since 1979.

—Anita Cohen

Patents

(Continued)

to be followed at BNL. "There are a lot of loose ends and I think it will be months before we'll see the new policy," says Bogosian, "and there can be no change at BNL until DOE changes the prime contract to include the new patent provisions."

For BNL there is some precedent. The National Radio Astronomy Observatory (NRAO) is operated by AUI for the National Science Foundation (NSF). After enactment of the Dole-Bayh Bill in 1981, NSF was one of the agencies which elected to change its patent policy accordingly. Subsequently, the AUI Trustees set up the mechanism by which this policy was implemented at NRAO. Just how many of the Observatory procedures are applicable to BNL, will be determined by the Trustees. Until these various steps are carried out, the patent policy at the Lab remains as is.

ANS Meeting

Joseph Hendrie will address a dinner meeting of the Long Island section of the American Nuclear Society on December 5. Hendrie, a senior scientist at BNL and currently president of the American Nuclear Society will talk on "The Role of the American Nuclear Society." In his talk he will discuss topics of interest to nuclear scientists and engineers concerning the evolving conditions of their disciplines, the industry and the part ANS will play in the future.

The meeting will be held at the Bavarian Inn, 422 Smithtown Blvd., Lake Ronkonkoma; cash bar, 6 p.m., dinner at 7 p.m. LIANS member \$10.50, non-member \$11.50. For reservations call Lois Holub, 929-8300, Ext. 3203.



Alex Reben

(Top, from left) Edward Gaudet, Edward McKenna, George Korn, George Smith and (bottom) Robert Scheuerer stand by beam lines X-13A and 13B. They were part of the NSLS team which performed the retrofitting and installation of the front end chambers of the X-ray ring.

BROOKHAVEN BULLETIN

Published weekly for the employees of BROOKHAVEN NATIONAL LABORATORY

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Holiday Toy Drive

BNL, Grumman Corporation, United Artists Theatres, McDonald's and the 7-Eleven Stores are but a few of the area's industries that have been organized by the Town of Brookhaven to promote Town projects and programs. Officially known as Interface, the alliance has begun its activities by participating in a 1984 Holiday Toy Drive. This drive is not in competition with the toy drives conducted by the Salvation Army or the Marine Corps League. Rather, it is intended to augment those programs by reaching more contributors and collecting more toys for more needy children.

Lab employees may drop off new or slightly used toys for needy children at the BERA Store in Berkner Hall each working day, Monday, December 3 through Friday, December 14, between the hours of 9:00 a.m. and 1:00 p.m. Employees who intend to gift-wrap their contributions are asked to indicate on the outside of the packages the sex and ages of the children for whom the toys would be appropriate.

Let's help make this holiday season a happy one for the deprived children of Brookhaven Town.

Equipment Demo

The Computer Systems Division of the Harris Corporation will present their products at Berkner Hall on Friday, November 30, between 10 a.m. and 2 p.m. The briefing will describe the hardware and software capabilities of their products, ranging from Models H10 and H20 Single User Engineering Workstations, rated at .575 MIPS, to the Model 1000 Super Mini Computer, capable of handling up to 192 users, and rated at 5 MIPS.

Cafeteria Menu

Week Ending December 7

Monday, December 3	
Chicken rice soup	(cup) .65 (bowl) .85
Beef teriyaki & 1 veg.	2.30
Quiche Lorraine & 1 veg.	2.00
Hot Deli — Baked ham	(bread) 2.00 (roll) 2.20
Tuesday, December 4	
Lentil soup	(cup) .65 (bowl) .85
Pot roast of beef & potato pancake	2.25
Broiled ocean perch & 1 veg.	2.00
Hot Deli — Sloppy Joe's	2.20
Wednesday, December 5	
Beef noodle soup	(cup) .65 (bowl) .85
Fresh ham w/ sweet potatoes	2.10
American chop suey & 1 veg.	2.15
Hot Deli — Turkey breast	(bread) 2.10 (roll) 2.30
Thursday, December 6	
Cream of tomato soup	(cup) .65 (bowl) .85
Pork 'n cabbage crisp on toasted Chinese noodles	2.15
Chicken cacciatore & 1 veg.	2.25
Hot Deli — Top round of beef	(bread) 2.10 (roll) 2.30
Special: Top your own baked potato	1.00
Friday, December 7	
Fish chowder	(cup) .65 (bowl) .85
Chinese pepper steak on rice	2.15
Shrimp & fries	2.25
Hot Deli — Breaded fish fillet	(bread) 2.00 (roll) 2.20

Stockroom Notice

Building T-91 will be closed for inventory on December 13 and 14. All withdrawals of stock should be made prior to 3 p.m., Wednesday, December 12. This will give the Supply and Materiel Division sufficient time to prepare for the inventory. Emergency requirements should be processed through Mike Guacci, Ext. 2976.

Arrivals & Departures

Arrivals

Kamal K. Bandyopadhyay DNE
 Ellen P. Gannon-Weider S&EP
 Arthur H. Jens Central Shops
 Jeffrey P. Zahradka Physics

Departures

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

Kathleen Carr DAS
 Dah-Ren Kwang Chemistry
 Louis A. Licalzi Central Shops
 Edward V. Sayre Chemistry

Diners Note

The Cafeteria will be closed on Saturday, December 1. On that day, snack bar service will be available from 9 a.m. to 2 p.m. at the Brookhaven Center.

BERA News

You're Invited

The BNL Theater Group will have an open meeting at Berkner Hall on Friday, December 14, beginning at 8 p.m. At this time, readings and musical arrangements in the holiday spirit will be presented.

The Lab community is cordially invited to attend and/or take part in the festivities. It will be free of charge and refreshments will be served. Anyone interested in performing should contact Karl Swyler at Ext. 7171.

Cooking Exchange

The annual Cooking Exchange holiday party will be held in the Recreation Building on Wednesday, December 5, at 5:30 p.m.

Guests are requested to bring a tray of their favorite hors d'oeuvres or appetizers. Also, a donation of \$1.00 per person will be collected.

For those who want to bring their children, babysitting will be provided at 50¢ per child.

Please come to see new faces and visit with old friends. For more information, call Dee Polychronakos at 744-3578.

Volleyball

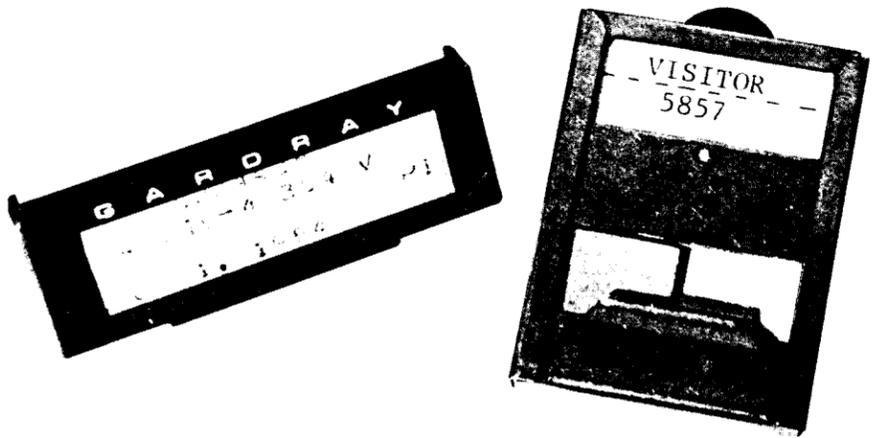
Standings

C League		W-L
Screwballs		7-2
Tigers		7-2
Couples		4-5
Quirks		4-5
Craw		3-6
Captain Midnight		2-7
Open League		
Phoenix		9-0
Odds/Sods		7-2
Team 6		4-5
Half Lives		3-6
Rowdy Radicals		3-6
Generic		1-8

Bowling

Red/Green League

High games were bowled by K. Asselta 225, R. Larsen 222, N. Tyler 222, E. Sperry 215/210, A. Borrelli 209, G. Meinken 208, K. Riker 205, E. Meier 201, C. Bachsmith 201, J. Muller 201, N. Combatti 201.



Over the weekend, all of the old metal film badges (right) will be collected and replaced by new, blue plastic badges, like the one on the left. So make sure your badge is on the board before you leave today.

Badge Bulletin

Everyone who wears a film badge on a regular basis knows they are exchanged monthly. But even knowing the schedule, it's not easy to tell that the trade has taken place. Come next Monday morning, however, the change will be readily apparent, because over the weekend all metal film badges will be replaced with lighter, more colorful, plastic versions. To facilitate this changeover, employees are asked to make sure their film badges are left on the boards in their workplaces before leaving work today.

A film badge is a tiny gadget that clips onto one's clothing. Any expo-

sure to radiation affects the film contained within the badge. By processing the film, an individual's exposure to radiation, if any, can be calculated. Primarily, the current change in the film badge reflects a change in the method of processing the film. Up until now, processing has been done by the Safety & Environmental Protection Division (S&EP) at BNL; once the new badges are in use, processing will be done by a Chicago-based firm.

Employees will be able to tell at a glance if they have forgotten to turn in their film badges over the first weekend of the month, because the new film badges come in three colors. The ones that will show up on Monday, for example, will be blue, while yellow and green will be the colors used in the next two months. After that, the rotation will begin again with blue.

"The idea," said Alan Kuehner, who assisted in the coordination of the changeover, "is that if you haven't changed color, you're behind the times. One way to be sure your color changes when it should, as well as to insure better dosimetry, is to get in the habit of hanging your film badge on the board whenever it's not on your body."

The same color scheme will apply to film badges issued on a temporary basis to employees and visitors. Those people should also return their film badges for processing on the Friday preceding the first weekend of every month, including today, so that everyone can start December with the new type of film badge.

If you have any questions regarding the new film badges, please contact, Alan Kuehner, Ext. 4226; Leigh Phillips, Ext. 4235; Connie Swezey, Ext. 4215, the safety coordinator in your building, or your S&EP representative.

Hospitality News

The next Hospitality Committee morning get-together will be a "Holiday Special." Spread your country's Yuletide spirit by telling us about your nation's celebration of this season. If possible, bring something made for these festivities, such as a tree ornament, decoration, toy, etc.

We will meet at the Brookhaven Center on Tuesday, December 4, at 9:30 a.m. Wives of employees, guests and visitors are welcome. Bring the children; babysitting will be provided free of charge. Coffee, tea and danish will be served.

Attention Visitors

The International Hospitality Committee of New York City is able to provide free tickets to City events for visiting foreign scholars and their families.

Now available are tickets to a concert by Austrian violist Thomas Riebl, at Alice Tully Hall, December 4, at 8 p.m. Riebl won the Naumberg prize for viola in 1982.

Foreign scientists visiting Brookhaven can obtain tickets by calling the Office of Scientific Personnel, Ext. 3338.

Pool/Gym Information

Pool

Starting Monday, December 3, the swimming pool will be closed for maintenance. The reopening date will be announced in a future issue of the Bulletin.

Locker/Shower Rooms

Pest exterminators are scheduled to be at the pool and gym on Friday evening, December 7. To facilitate their work, all locker users are asked to empty their lockers and leave the doors open. Failure to comply with this request will necessitate removal of locks and locker contents before pest extermination begins. Lockers will be ready for use on Saturday, December 8 at 10:00 a.m.

Gymnasium

Due to the Blood Drive which will be held in the gym, the gym will be closed to all activities from December 17 until 5 p.m. December 20.

During the month of December, the normal gym schedule will be in effect except during the period noted above and from noon, December 24 through December 26.

Microcomputer Club

The BERA Microcomputer Club is now supporting IBM-PC usage by offering IBM-PC compatible machines (two drives, 128K, serial and parallel port, case and keyboard, monitor driver but no monitor) for \$1000. Also, a library that will be available to club members is being established and will include home, business and game programs. For further information, come to our meetings Thursdays from noon to one, Bldg. 463 (Biology), small conference room, or contact Jim Hainfeld, Ext. 3372.

Concert Rehearsals

A schedule of rehearsals for the annual Christmas Concert has been set for every Tuesday and Thursday at noon in Berkner auditorium. Each rehearsal is expected to last not more than half an hour. All interested singers are invited to rehearse with the BNL Choral Group for this annual concert which will be presented in the cafeteria on December 19.

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 Employment Manager, 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.

SCIENTIST/ENGINEER. Openings exist in a new DOE-funded technical support organization for (a) geochemist to evaluate through literature reviews long-term performance of engineered barriers in a high-level nuclear waste repository; (b) metallurgist to evaluate through literature reviews materials used for nuclear waste storage; and (c) physical chemist to evaluate through literature reviews methods for the disposal of nuclear waste. Contract. D.G. Schweitzer, Department of Nuclear Energy.

SCIENTIST/ENGINEER. Openings exist in NRC-funded ongoing programs for (a) chemist to evaluate characteristics of low-level waste and properties of materials used to solidify and/or contain the waste, through literature reviews; (b) geochemist to assess the behavior of the waste package system and the near-field geologic environment in which it is placed; and (c) scientist trained in chemistry, physics or materials science to assess selected models for predicting high-level nuclear waste package performance. Contact: P. Soo, Department of Nuclear Energy.

ENGINEER - to work on reliability analysis of LWR fluid systems and electrical systems. Knowledge of fault tree techniques, statistical data analysis, or Markovian reliability analysis is desirable. Contact: R.A. Bari, Department of Nuclear Energy.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

2145 **FACILITIES OFFICE ASSISTANT** - Requires experience performing office related clerical functions such as detailed recordkeeping, filing, and heavy telephone work. Good typing skills are necessary. Will be responsible for diversified office duties for the Site Division. Plant Engineering Division.

2146 **TOOL AND INSTRUMENT MAKER** - Central Shops Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2147 **SYSTEMS ANALYST** - Requires a BS in a relevant discipline plus substantial background in administrative and management systems design utilizing data base techniques. Extensive experience in COBOL is necessary and experience with Hewlett Packard 3000 is highly desirable. Management Information Systems Division.

2148 **ADMINISTRATIVE-CONTRACTS POSITION** - Requires a bachelor's degree in a technical field, business administration, accounting or equivalent and a minimum of two years experience in a professional level procurement and/or contracting environment. Will provide support within all areas of the Division. Contracts and Procurement Division.

2149 **DESIGN POSITION** - Requires experience in machine and tool design, manufacturing and assembly, material strengths and selection. Knowledge of geometric tolerancing applications ANSI Y14.5M-1982 and CAD desirable. Requires ten years experience as a designer and a minimum of five years as a design checker. Alternating Gradient Synchrotron Department.

2150 **PROJECT ENGINEER** - Requires a BS in mechanical engineering or equivalent and at least ten years experience in machine design, fabrication and testing. A working knowledge of cryogenics, magnets and instrumentation is desirable. Work includes a wide range of applications from precision instruments to large structural parts and the design of neutron spectrometers. Will be responsible for overall project coordination, including planning, budgeting and scheduling. Physics Department.

2151 **FACILITIES PROPERTY MANAGEMENT TECHNICAL LIAISON POSITION** - Requires a bachelor's degree in a relevant field or its equivalent and significant administrative and/or technical experience applicable to administrative planning, coordination and control in support of scientific research. Responsibilities include building and facilities operations, maintenance, and development, property management, technical services coordination, safety administration and other related functions. Position requires the development and implementation of systems and procedures and application of computerized business systems, excellent oral and written communication skills and the ability to work with a high level of independence. Experience with development and use of scientific equipment is highly desirable. Physics Department.

Autos & Auto Supplies

73 MERCURY MONTEGO - 2 dr., V8, low mi., \$675. 588-2956 after 7 p.m.

SNOW TIRES - (2) E78-14 w/wheels for Dodge Aspen, \$20. Leonard, Ext. 4457.

71 TOYOTA CORONA - a/t, 4 dr., 25 mpg, runs well. 281-7230.

81 TOYOTA STARLET - 5 spd., a/c, am/fm, excel. cond., \$3,500. Ext. 2576 Mon.-Tues. or 221-4448 eves.

81 TOYOTA CORONA - 5 spd., 4 dr., excel. cond., a/c, p/s, 4-speaker am/fm, \$6500. D. Hardy, Ext. 3389.

71 DODGE DART - V8, p/b, p/s, a/c, excel. running cond., asking \$599. Ext. 4935 or 928-5787 eves.

79 RABBIT DIESEL - 44 mpg, 4 dr., tan, clean, high mi., best offer. George, Ext. 3636 or 4552.

79 CHEVY MALIBU - station wagon, small 267 V8 eng., a/t, p/s, p/b, a/c, low mi., excel. cond., roof rack, \$3,450. 757-2178.

80 MUSTANG - 4 cyl., a/c, p/s, p/b, a/t, 2 dr., 42,000 mi., Landau roof, \$3,500. 878-2421.

80 DATSUN 210 - 4 dr., 5 spd., a/c, am/fm, excel. cond., 35 mpg, \$3,500. Tom, Ext. 4664 or 929-3566.

72 GRAN TORINO SW - 302/V8, a/t, \$300. 981-2045 after 3 p.m.

76 OLDS OMEGA - 68,000 mi., \$1,000. John, 732-2472.

79 CHEVY MONZA - V6, 4 spd., p/s, p/b, a/c, am/fm stereo, new tires, good cond., \$2,800. 878-0012.

78 CAMARO - p/s, p/b, a/c, 305 V8, sunroof, am/fm cassette, good cond., \$3,200. Ext. 4288 or 567-8301.

72 DODGE DART - 6 cyl., \$500 neg.; 1969 Dodge Dart, new everything, \$2,000 invested, sell at \$600. 929-6531.

76 DODGE DART - a/c, p/s, p/b, new tires, runs well, \$950. G. Watson, Ext. 4716 or 286-3679.

TIRE RIMS - F78-14, E-78-14, E70-14, \$5 ea. Ext. 4045 or 289-5770 after 6 p.m.

74 VW VAN - 110 HP eng., high performance clutch, am/fm cassette, 18-24 mpg, \$2,000. Rich, Ext. 2965 or 744-0960.

77 PLYMOUTH VOLARE - 6 cyl., 3 spd., standard, 19 mpg, good cond., \$1,350. Mike, Ext. 4605 or 281-5456 after 6 p.m.

71 DATSUN - \$400. 286-9051.

67 PONTIAC LEMANS - new eng., trans., runs well, \$750. Bob, Ext. 2088 or 924-0834.

65 MUSTANG - 2+2 Fastback, \$500 firm. Maria, Ext. 7692.

81 FORD ESCORT - station wagon, a/t, p/s, p/b, a/c, rear def., roof rack, radio, \$3,500. 758-6785.

78 MUSTANG - standard 4 spd., am/fm, low mi., clean. Bill, Ext. 4068 or 473-3171.

76 TOYOTA COROLLA - 65,000 mi., brown w/brown vinyl roof. Jack, 281-2382.

73 FORD MAVERICK - 6 cyl., 4 dr., a/t, p/s, runs well, \$899. Bob, Ext. 2104 or 928-3863.

80 AUDI 500S DIESEL - 5 spd., 38 mpg, all power, a/c, cruise control, am/fm tape, met./red, low mi., \$7,900. 941-4999.

SNOW TIRES - mounted on rims, fit Chevy auto., \$25 for both. Joe, Ext. 4255 or 289-1831.

77 PLYMOUTH VOLARE - a/c, p/b, p/s, radio, good running cond., \$1,000. 281-4871 after 5 p.m.

TIRES - (2) 15", w/w, steel belted, \$15. 727-5912.

BONAIRE VACUUM - clear wet & dry for auto, used once, \$15. 727-5912.

70 FORD TORINO - dependable. Elizabeth, 588-1754 after 3 p.m.

31 CHRYSLER - 2 dr. Coupe, Model CM, rumble seat, excel. cond., all orig., asking \$9,800. Ext. 3160 or 289-5704 after 5:30 p.m.

81 PLYMOUTH - TC3, 4 spd., am/fm, mint cond., maroon, 4 cyl., matching interior, \$4,200. Ext. 2898 or 363-7620.

TIRES - 185/175x15, Sears Snow & Ice Road-handlers, w/w, steel belted, \$30/pr. Ext. 2705 or 286-1062.

71 VOLVO - 142E, 4 spd., as is, \$650. Aug. Ext. 2898 or 363-7620.

68 PONTIAC TEMPEST - 8 cyl., 50,000 mi., clean, \$700. Marge, Ext. 3158 or 727-7075 eves.

70 OLDS 88, p/s, p/b, runs well, \$400. Jeanne, Ext. 7742 or 2364.

71 PORSCHE 914 - asking \$4,100; 1978 Olds Cutlass, 8 cyl., 4 dr., p/s, p/b, a/c, low mi., \$3,600. Katherine, 281-8021.

80 DATSUN 200SX - am/fm stereo w/quad speakers, a/c, p/s, p/b, 5 spd. turbo, elec. test system/side mirrors, tinted sunroof, good cond., \$5,500. 654-0830.

75 CADILLAC COUPE DEVILLE - mechanically sound, recent paint, new vinyl roof, \$3,000. 924-3522.

81 GRAN LEMANS - station wagon, 33,000 mi. Ed, Ext. 7786.

71 TORINO - very good cond., 302 cu. in. 727-0082 after 6 p.m.

74 DUSTER - 6 cyl., std. trans., 86K mi., reliable, some rust, \$550. Tony, 543-4501.

SNOW TIRES - C78-13, excel. cond., \$40/pr.; VW tune-up kits, 1964-1967, \$2.50 ea. Susan, Ext. 4267.

78 CADILLAC DEVILLE - mint cond., all options, low mi., \$6,000. 475-6938.

79 FORD - Country Squire station wagon, 50,000 mi., all power, new tires, \$3,500. J. Solaer, 475-4596.

78 GMC JIMMY - 4 wheel drive, p/s, p/b, auto, excel. cond., \$5,500. Carl, Ext. 3507 or 286-8794.

78 MERCEDES BENZ 300 - diesel, very good cond., asking \$10,500. Ext. 7959 or 727-5803.

68 VW BEETLE - very little rust, everything works, asking \$400. Gary, Ext. 7518 or 589-5490.

83 PLYMOUTH HORIZON - 4 spd., 4 dr., am/fm cassette stereo, mint cond., 20,000 mi. 475-6773 after 6 p.m.

VOLKSWAGON SHOP MANUAL - gas & diesel engine, Rabbit/Scirocco, 1975-1979, \$5. Ext. 2981.

75 OLDS CUTLASS SALON - loaded, new tires, hi. mi., \$1,200; 1972 Jaguar XJ-6, very good mech. cond., bright green, all options, saddle int, \$4,000. 727-3115 or 728-0939 weekends.

Miscellaneous

CABBAGE PATCH DOLL - girl, orange hair, green eyes, \$70. Sheree, Ext. 2907 or 727-3698.

CHAIRS - (2) chrome frames, \$5 ea.; (2) brass magazine racks, \$5 ea.; spice rack, 12-jars, \$5. 281-7844 eves.

LIVINGROOM SET - 5 pc. Mexican, hand carved, good cond., needs 3 cushions for couch, \$650 neg. 654-0830.

INTELLIVISION - w/carrying case & 15 tapes, good Christmas gift. Pat, Ext. 2939.

DECORATIVE PLANTERS - Colonial spinning wheels, maple, sml. \$8, lrg. \$20, Nancy, Ext. 5274.

SECRETARIAL STAND - new, plastic, \$20. Susan, Ext. 4267.

CITRUS FRUIT - white/pink grapefruit, Hamelin/Navel oranges, tangelos, \$7-10/box, delivery Dec. 17. Glenn, Ext. 3336.

BOY'S SNOW BOOTS - size 8, \$6; boy's football shoulder pads, \$12. Maurice, Ext. 2487 or 928-6930.

DESK CHAIR - wooden swivel type, \$30; adult wooden crutches. Ext. 7509.

WOMAN'S WINTER COAT - lamb, leather, new, greenish brown, \$400. Ext. 3293 or 3002 eves.

CONVECTION OVEN - fiberware continuous, clean, excel. cond., \$100. Ext. 3173.

PLAYER PIANO - rolls, old. John, 732-2472.

BEDROOM SET - 6 pcs., contemporary style, walnut triple dresser w/mirror, high chest, night stand, 2 twin bed head boards, excel. cond., moving must sell, \$590. Ext. 3293 or 698-6437 eves.

CABBAGE PATCH DOLLS - (3), boy w/hair, bald boy, girl w/pacifier, \$60-70; Koosa critter, a Cabbage Patch kid's pet, \$55. 286-3623 leave message.

CORONET - Olds w/case, \$125. Jim, Ext. 3372.

DAIRY GOATS - registered, Alpine, ready-breeding, excel. milkers, 363-2736.

GAS RANGE - Caloric Hi-low w/rotisserie, avocado, \$200. Ellie, Ext. 3395 or 325-1537 after 6 p.m.

COLECO VISION CART - 3 game cart, \$80; Fischer 160 skis w/Tyrolia bindings, poles, men's Raichle boots, size 12; \$125; Remo drum pad, w/stand & drum sticks for beginner; \$40; ping pong table, \$35. Ext. 3604 or 878-0516.

SOFA - flowered taupe/apricot, \$250; coordinated club chairs, apricot, \$75 ea.; small swivel rocker, matching rocker, gold velvet, \$50. 286-3434 eves or weekends.

SKI BOOTS - Rossignol-comp, 170 cm, w/Solomon binding, \$40; Iowa, German air-boots, size W5, \$30; womens ski boots, size 5, Keirling, Swiss leather, \$15. Ext. 3926.

RABBIT COAT - size 7, rust, like new, \$100. 281-7073 after 5:30 p.m.

SKI BOOTS - Nordica, never used, size 13M, \$50. 878-9256.

COLOR TV - Zenith 19"; B&W. both excel. cond., make offer. 473-2473.

ELECTRIC BASEBOARD HEATER - 8' long, good cond., \$50. Ext. 3705 or 862-7998.

PORTABLE WASHING MACHINE - Sanyo, new, 3 wash cycles, \$250. Peter Eterno, Ext. 4167.

SILK SCARVES - orig. design, hand painted, washable, \$20 ea. 472-1596.

WOODEN DOORS - (1) 2'8"x6'7", (1) 2'x6'5-1/2" w/hardware, both good cond. 325-0447 after 6 p.m.

COLOR TV - 19", 9 mos. old, under guarantee, view on site, \$200. Jim, Ext. 2364 or Ext. 3126 after 6 p.m.

PORTABLE PHONOGRAPH - nearly perfect cond., \$15. 751-3551.

QUILTED BEDSPREAD - red, white & blue, twin size, \$15. Les, Ext. 2920.

CUSTOM TRESTLE TABLE - solid 1 1/4" pine, 3" apron, 42x72, 4 rush hi-back N chol/Stone chairs, \$700. 744-3289.

DOG - Cairn Terrier, male, neutered, AKC. Ext. 4091 or 821-1039.

WATER PUMP - Sears, 20 gal. tank, \$50; double bed frames, 2 sets, \$5. Dan, 285-0745.

RECORD PLAYER/STEREO - Teletone, 2 speakers, excel. cond., \$35. Donna, Ext. 4007.

CB ROOF ANTENNA - 17', best offer. Ext. 2830.

DINING ROOM - table w/leaf, 6 chairs, china cabinet, \$175; living room sectional, 4 pcs., good cond., \$75. 924-3783.

CHRISTMAS COOKIES - \$5/lb.; fruitcakes, \$5.25/lb.. Lab delivery. Adrienne, 286-8424.

CAMERA - Minolta XG-1, 35mm, new, carry-all bag & automatic electronic flash, \$150. Ext. 2456.

TR5-80 COMPUTER - color, cassette games, two joy sticks, bargain, \$125; 10 spd. bike w/twin baskets, ideal for paper route, \$35. Joe, Ext. 4255 or 289-1831.

COLOR TV - 19", \$30; CB Antenna, \$5; 4 shock absorbers, 1968 Dodge Dart, new, \$5 all. Victor, Ext. 2395.

SEARS PORTABLE DISHWASHER - formica wood-tone top, \$75 neg.; Sears B&W TV, 19", \$25. George, 821-0766.

PING PONG TABLE - w/accessories, \$50. Paul, Ext. 4156.

COUCH - 2 pc., 9', floral print on ivory background, good cond., can deliver, \$110. 929-8287.

UNICEF XMAS CARDS - & gifts, for order or info. Anh, Ext. 2022 lunchtime or 744-8386 eves.

RUG - gold, low shag, 11'8"x9'4", \$75; rabbit fur coat, womens size, white w/beige, \$75; brown calico rabbit jacket, toddler 4, \$25. Ext. 2050.

STEEL GARMENT HANGER - \$9; dbl. headboard, \$25. 2-tier corner table, \$15. 744-1750.

TABLE - 48" Bennington pine, 2 leaves, \$200. Lynn, 473-6321 before 4 p.m. or 928-8919 after 4 p.m.

GARAGE DOOR - 8'Wx7'H, low clearance, swing type, \$50. Joe, Ext. 5233 or 369-0432 eves.

DINING TABLE - 58"/70"x42", oval, excel., \$50. Ext. 2830.

SONY WALKMAN - fm stereo, model SRF-30W w/MDR-1 headphones, batteries, \$29. Ext. 7192 or 924-0813.

GOLF BAGS - ladies new w/head covers, \$30; mens Browning Club Master, bag and cart together. R. Feindt, 654-3060 after 6 p.m.

TICKETS - for Chanukah concert, Dec. 8. SUNY Stonybrook, featuring Ruach, (4) students, \$8. 981-5696.

TABLE - iron & glass, 4'x2-1/2' w/4 matching chairs, 744-9749 from 7-9 p.m.

PARCHMENT NOTECARDS - (10) orig. designs. Helen, Ext. 7791 or 475-6570 eves.

COLOR TV - GE, 25" console, recently serviced, best offer. 288-1398 after 6 p.m.

CHILD'S ELECTRIC ORGAN - w/bench, excel. cond., \$30. John, Ext. 5152 or 281-2471.

STORAGE RACK - 5-shelf, steel; projector screen, \$20; chest, \$30; Atari 2600 & 7 tapes, \$100. 744-1750.

FARBERWARE CONVECTION TURBO-OVEN - Yako, Ext. 2592 or 3349.

BOSE 901 SPEAKERS - w/stands, Series I, \$275/pr. Brian, Ext. 2799.

MARQUIS DIAMOND RING - 2 baguettes, total 1 pt., appraised \$3,125, price \$1,950 firm. Mary Ann, 286-2435.

STORAGE SHELVES - (2) metal, 75" + 72" Hx36" W, 18" W shelves, \$10 ea.; heavy workbench cabinet, \$20; evergreens, you dig, 2 for \$9. 878-6637.

COUCH & LOVE SEAT - modern, rust & tan velvet, Lang coffee & end tables, \$450 for all. 286-0422 eves.

SKI RACK - fits on car trunk lid, \$30. Les, Ext. 2920.

COMMODORE 64 COMPUTER - w/single disk drive, some software, \$450. Ext. 3173.

DINETTE SET - Early American, solid maple, table w/leaf & small hutch, \$150. Ext. 2926 or 281-0268.

CAMERAS - Kodak Instamatic 40 w/case & electronic flash, \$20; Voigtlander Bessamatic SLR w/Voigtlander lenses, 2.8/50 mm, 2.8/135 mm & portrait lens, filters & cases, \$125. Ext. 2981.

Free

RED DOBERMAN - 3 yrs. old, must give up to move, great w/children; Siberian Husky w/papers, AKC, 6 yrs. old, female. 744-1234.

DOBERMAN - spayed, 3 yrs. old, female, used to other animals & children. Vicki, Ext. 2902 or 744-8765 after 7 p.m.

Yard Sales

HOLIDAY SALE - Christmas gift items, jewelry & handmade fabric items, Open house sale, Dec. 10-11. Adrienne, 286-8424.

Car Pools

E. NORTHPORT/ELWOOD - 4 driver pool looking for 5th driver. Paul, Ext. 4156.

MATTITUCK - rider/driver wanted to fill car pool. Bill, Ext. 3992 or 298-4172.

BAYPORT - rider/driver to fill existing car pool. Ext. 4159/4085 or 2408. beeper 460.

SMITHTOWN PINES/HAUPPAUGE - want to start car pool, flexible. Vasilis, Ext. 2830.

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

BELLPORT VILLAGE SOUTH - near bay, stores, fully furnished, spacious, modern house, includes all appliances & piano, mid Jan.-mid July, adults only, rent negotiable to responsible tenant. 286-0379.

SHIRLEY - 3 bdrm. ranch, 5 min. to Lab., full basement, fenced in yard, \$600/mo. plus util., avail. immed. Mickey, Ext. 3173.