BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

BNL/Stony Brook Team Up On Materials Research

The Atomic & Applied Physics Division (AAPD) of the Department of Applied Science (DAS) has teamed up with the Materials Science & Engineering Department (MSED) at SUNY-Stony Brook to begin investigating alloys of metals having improved wear and corrosion properties using a complement of equipment and techniques.

Their collaboration came as a result of the gift of an ion implanter to Stony Brook, which is now housed at BNL. Since the problems they will explore are of interest to the aerospace and automobile industries, semiconductor manufacturers and biomedical engineering firms, AAPD and Stony Brook have invited industry to join in collaborative materials research.

"We are creating a new research group and want industry to consider us as a resource for materials research," explains Clive Clayton, MSED associate professor at Stony Brook. "With our combined interests in materials and analytical capabilities, the Lab and Stony Brook can research a problem in much greater depth than a corporation can usually afford. Our combined approach will enable us to transfer technology to industry, as well as get their feedback and some funding, and provide excellent training for graduate and postdoctoral students."

Roger Stoutenburgh

At the control panel, (from right) Allen Goland, Clive Clayton, Robert Mills, Keith Jones and Albert Hanson review preliminary data from early tests of the ion implanter.

To interest industry, a workshop on collaborative research in the materials sciences was organized by Allen Goland, head of the Energy Science Programs of DAS, Keith Jones, AAPD head, and Clayton last February at the Lab. "At that time, a number of possible materials research projects were identified," states Goland, "and practical methods for implementing collaborative research were discussed. Encouraged by our interactions at the workshop, we decided to explore ways to open our facilities and equipment at the Lab and University to industrial users for both pure and proprietary research in materials sciences."

The 200-keV Extrion ion implanter was donated in spring 1984 to Stony Brook by the General Instrument Corporation of Hicksville because MSED has been involved in ion implantation metallurgy for the last seven years. The implanter, originally used for producing semiconductor devices, is not a new or sophisticated tool, but it has permitted the initiation of materials research involving the Lab, the University and industry.

"We have the technical capability to make an instrument like that run, so it made sense to move the implanter to BNL," says Jones. Though Stony Brook holds title to the implanter, it was moved in the summer of 1984 into Jones's Building 901 laboratory and required substantial rebuilding by AAPD.

The implanter was put in operation in November through the efforts of Physics Associate Robert Mills; it has been undergoing tests prior to full scale experimentation since then. Physicist Albert Hanson has been working with Jones, Clayton and Professor Herbert Herman from Stony Brook to get the experimental work started.

"While we have made it work and now operate it, both Stony Brook and BNL have people with the knowledge and desire to use the unit's ion beams, such as those of nitrogen, boron and phosphorus, to implant atoms in materials, like stainless steel, and to study the resulting modified materials."

Analysis of the properties of these coatings will be carried out both at BNL and Stony Brook. Jones and his division will employ a 3.5-MV Van de Graaff accelerator to perform depth profiling of metal coatings, an x-ray microprobe on a dedicated NSLS x-ray beam line for trace element analysis, and the heavy-ion beams and high-energy, light-ion beams of the Tandem Van de Graaff for nuclear reaction analysis.

Coupling the 3.5-MV Van de Graaff and the ion implanter, Jones will be able to co-focus beams: an ion implantation beam will be imparting energy to depositing atoms while an analytical beam will be studying the composition of the alloy.

The collaborators want to conduct research on ion beam enhanced deposition (IBED), the latest method of surface modification. Explains Clayton, "Say you are implanting chromium atoms on an iron surface; you can produce an iron-chrome alloy as a result, which is the basis of stainless steel. The trouble is that alloys created in this way are very thin, only 500 angstroms thick. On the other hand, if you deposited the layer by evaporation without an ion beam, you would always get some flaws in the coating and no alloy formation.

"However," continues Clayton, "if you give some energy to the vaporized atoms by simultaneously using an ion beam, the atoms can move around on the surface, producing a dense, nearly flaw-free deposit, and can even penetrate the surface. So you have implanted the chromium into the iron. And instead of a discrete interface between the chromium deposit and the iron which you can peel, you get an interfacial zone and a deposit which adheres well and has fewer flaws.

"Another benefit of IBED," adds Clayton, "is that you have an interfacial alloy having tremendous bonding which you can develop into thicknesses greater than 500 angstroms, up to ten microns. Additionally, you can grade this coating, or have more than one element or compound being deposited as the coating. You could get intermixing between elements

(Continued on page 2)

BNL Lecture

What's In a Spin

Electrons, protons and neutrons have definite properties such as charge and mass. In addition, they all seem to be spinning in a manner similar to rotating tops. Until recently, proton beams in the AGS had their spins pointing in random directions. To provide beams of protons which spin in the same direction is the aim of the polarized project at the AGS. This will give high energy physicists an opportunity to study the effects of spin at AGS energies.

Physicist Yousef Makdisi, AGS Department, will discuss this project in "Spinning Tops and Polarized Protons" in the next Brookhaven Lecture on Wednesday, February 20, at 4:30 p.m. in Berkner Hall.

He will introduce the concept of spin in elementary particles and give a brief history of the experimental results that brought about the idea of spin as a way to solve puzzles in atomic spectra. He will also describe the early approaches that produced polarized proton beams for experimentation, leading to the development of high energy polarized proton beams in circular accelerators.

Makdisi will then describe in detail the specialized equipment built at the AGS for this project, and the painstaking effort needed to preserve polarization at world record energies of 16.5 GeV. This special equipment includes the polarized H- ion source, the radio frequency quadrupole preaccelerator, the 200 MeV polarimeter, and new fast quadrupoles.

Yousef Makdisi received his Ph.D. in high energy physics from the University of Minnesota in 1976. He also held a postdoctoral appointment at that university before coming to Brookhaven in 1979.

Roger Stoutenburgh

Yousef Makdisi

His interest in polarized protons is long-standing. While at the University of Minnesota he worked on a number of experiments using polarized proton and deuteron beams at the Argonne ZGS. During his career at BNL, he has been closely associated with the AGS polarized proton project and has responsibility for the transfer of the polarized beam from the source into the AGS. Makdisi is co-spokesman for one of the two high energy physics experiments currently using the AGS polarized proton beam. The experiment is a collaboration of BNL, the University of Minnesota and Southeastern Massachusetts University, to measure the asymmetry in the distribution of pions, kaons and protons produced when polarized protons strike a non-polarized hydrogen target.

All those interested in getting together after the lecture are invited to go with the lecturer to a restaurant off-site. If you want to be part of this group, call George Rabinowitz, Ext. 7637.

Mort Rosen

The BNL directorate is busy overseeing the programs and trying to solve the problems of a diverse and active scientific institution. As such, they are on the go much of the time. Getting them all together for a commemorative photo was an administrative achievement. Here, then, seated, from left are Vincent O'Leary, Associate Director for Administration; Nicholas Samios, Director; Martin Blume, Deputy Director; and Seymour Baron, Associate Director for Applied Programs. Standing, from left, are Richard Setlow, acting Associate Director for Life Sciences; Robert Palmer, Associate Director for High Energy Physics Research; Henry Grahn, Assistant Director for Financial Planning; Jerome Hudis, Assistant Director for Scientific Staff Policy; and Paul Reardon, Associate Director for High Energy Facilities.

Mort Rosen

Shirley Chisholm, former Brooklyn Congresswoman, came to the Laboratory on February 7 to lecture on "The U. S. Constitution and Black Americans." On her arrival in the afternoon, she was given a briefing on the Laboratory at the Director's Office, and met with Lab personnel. Seated with Mrs. Chisholm, center, are April Donegain, Pres., Afro-American Culture Club, and Earl Blanton, Manager of the Affirmative Action office. Standing, are Martin Blume, Deputy Director; Otto White, chairman of the Affirmative Action Advisory Committee; and Deidre Seymore, special events chairperson of the Afro-American Culture Club. In her talk, Chisholm outlined the blacks' journey in America from slavery to the present. She said that at the height of the civil rights movement, "there was a heady optimism that, some day soon...racism in our society would be as unfamiliar and repugnant as cannibalism." But, to date, that had not happened. She urged that everyone should work to make the American dream of prosperity and equality become real for every American.

Investment Options Performance Summary

In February of 1982 Mutual Funds were added as investment options for voluntary employee tax-deferred contributions under the AUI retirement program. In order to provide Laboratory employees with information concerning the various investment opportunities available under the AUI retirement program, the Personnel Division has again compiled the performance records for the Fidelity and T. Rowe Price funds, and the TIAA-CREF regular and Supplemental Retirement Annuities.

Values as of 12/31/84, for monthly contributions of $100 started 1/1/84, 1/1/83 and 3/1/82

Past performance (hypothetical accumulations with dividends and capital gains reinvested and all expenses deducted). Security prices can fluctuate considerably and these yields should not be considered as representative of future earnings.

Date Contributions Commenced	1/1/84	1/1/83	3/1/82
Total Contributions	$1200	$2400	$3400
TIAA — CREF			
Regular (Non Cashable)			
TIAA	$1274	$2701	$4036
CREF	1269	2603	4173
SRA (Cashable)			
TIAA*	$1255	$2661	$3975
CREF*	1250	2564	4110
Fidelity Group Funds			
Cash Reserves	$1267	$2653	$3917
U.S. Government Reserves	1263	2643	3889
Corporate Bond	1318	2696	4077
High Income	1296	2717	4309
Thrift Trust	1329	2749	4142
Contrafund	1247	2418	3764
Discoverer	1238	2435	4007
Trend	1264	2546	4046
Mercury	1249	2452	N/A
Equity-Income	1337	2784	4580
Fidelity Fund	1287	2590	4174
Puritan	1326	2790	4480
Magellan	1289	2625	4587
Freedom	1291	2393	N/A
Select Portfolio			
Aerospace & Defense	N/A	N/A	N/A
Energy	1184	2504	3857
Financial Services	1410	3011	4934
Health Care	1246	2357	3828
Precious Metals	926	1788	3110
Technolgoy	1193	2300	4236
Utilities	1413	2996	4662
Leisure & Entertainment	N/A	N/A	N/A
Special Situations	1285	N/A	N/A
T. Rowe Price Funds			
Prime Reserve	$1270	$2661	$3926
U.S. Treasury Money	1262	2634	N/A
New Income	1285	2676	4054
Growth & Income	1255	2582	N/A
Growth Stock	1278	2477	3818
New Era	1243	2553	4050
New Horizons	1200	2263	3647
International	1171	2496	3916

*The TIAA/CREF SRA accounts (which are cashable) require a front end load charge of 1-1/2% for each monthly contribution.

N/A = Funds not in existence for the full time period were excluded from this comparison.

Fortran Forum

Most scientific programming is still done in Fortran in spite of the development of newer programming languages such as Pascal and "C." However, Fortran has undergone many improvements since its debut in the late 1950's. The American National Standards Institute's Technical Committee, called X3J3, has the responsibility of developing the next standard, "Fortran 8X."

A Fortran Forum, jointly sponsored by BNL and the L.I. Chapter of the Association for Computing Machinery, will be held in Berkner Hall, Room B on Wednesday, February 20 from 9:30 a.m. to 4:30 p.m. Members of the X3J3 Committee will make presentations on proposed additions to Fortran such as data abstraction and array processing features, and will be available for discussions. The detailed program can be obtained from the CSCF Library, Ext. 4144. There is no registration fee, but call Ext. 4144 if you plan to attend.

NATIONAL ENGINEERS WEEK
Feb. 17-23, 1985
ENGINEERS: TURNING IDEAS INTO REALITY

Materials (Continued)

that would not normally mix because you have given them energy by using the ion beam."

The Zymet Corporation of Beverly, Massachusetts, which designs and fabricates ion accelerators and IBED apparatus for the modification of surfaces, will be collaborating with BNL and Stony Brook to conduct research leading to a full understanding of this new technique, the first of several cooperative ventures the Lab and University are pursuing with industry.

"BNL and Stony Brook have pooled a variety of tools and talents to look at surfaces, near surface, and interface phenomena which are of interest to materials scientists and engineers," concludes Goland, "and we want industry to recognize the advantages of this combined strength in materials research which can work to our mutual benefit." — Marsha Belford

Arrivals & Departures

Arrivals

John W. Dubendorff ..... Biology
Olle W. Inganas ..... DAS
Walter F. Mangel ..... Biology
Yasutomo J. Uemura ..... Physics

Departures

None

Give So They May Live

Everyone must be aware of the plight of millions of people who are on the verge of starvation in Ethiopia because of relentless droughts and ever decreasing food supplies. But not everyone has done something about it.

The Afro-American Culture Club has been canvassing its members for contributions to this stricken country and collecting donations at its various events during Black History month. Recently it was suggested that they become the focal point for Laboratory-wide contributions, as well. This, they have agreed to do.

Of the many organizations coordinating relief supplies for Ethiopia, the Club decided to collect on behalf of UNICEF, which is supplementing its regular health and nutrition activities in that country with emergency food, medical supplies, blankets and other basic survival needs. According to a UNICEF spokesman, 100% of the funds donated goes toward the purchase of these supplies.

Through UNICEF, $25, for example, can buy an insulated portable vaccine carrier which can maintain the potency of up to 500 doses of vaccine; and $35 will purchase ten wool blankets needed by the people in the mountains.

The Club asks that checks be made out to the U.S. Committee for UNICEF and sent to the Afro-American Culture Club, P.O. Box 441, Upton, N.Y. 11973. Club members Bruce Penn (DNE) April Donegain (DNE) and Fran Ligon (DO) will also be glad to accept checks for the fund. Your contribution is tax deductible and UNICEF will send you a statement to that effect.

Boxes for cash donations will be placed at the cafeteria and the bank. When you've finished your lunch or cashed a check, drop some change into the Ethiopian relief box and think of it this way: 10¢ is a vial of penicillin to treat a child's infection and $1 will feed four children for one day.

The Afro-American Culture Club has agreed to maintain the drive until March 15.

Reminder

Completed applications for the 1985 Summer Student Program will be available for review in the Office of Academic Relations, Bldg. 460, 2nd floor, from February 19 to March 1. Staff members are invited to review applications to select students to work under their supervision from June 3 to August 16.

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Attention Visitors

The International Hospitality Committee of New York City invites visiting foreign scholars and their families to be guests at a concert at Alice Tully Hall, Lincoln Center, on Monday, March 11, at 8 p.m. Performing will be the Lydian String Quartet, Naumburg Award winners. This fine, young quartet will perform works of Berg, Hyla and Beethoven.

Foreign scientists visiting Brookhaven can obtain tickets by calling the Office of Scientific Personnel, Ext. 3338, by Tuesday, February 19.

Mort Rosen

The 33rd Brookhaven Semester is under way and nine students from predominantly black colleges are on site taking courses and doing research projects in biochemistry and physical chemistry. The students have been assigned to the Biology, Applied Science and Medical Departments, and will be here until May 3. Clockwise, from left, are Lesa Rice (S. Carolina State), LaTonya Kilpatrick (Jackson State), Alex Heard (Knoxville College), Melissa Gross (Hampton Inst.), Angela Burks (Alcorn State), Arthur Washington (Prairie View A&M), Sharon Moore (Grambling State), Melvin Rasco (Alcorn State). Miriam Jones (Hampton Inst.) was absent when this photo was taken.

Reporter's Notebook:

The Chocolate Cure

About once a week or so, around 4 p.m., the time civilized people reserve for tea and cakes, she would stride out of her office on a determined, almost predestined march. Left turn, right turn, through the lobby and through the door, left turn again, and there she was. Face-to-face with a tall, dark familiar object: the C A N D I E S machine.

The machine reflected her intense, yet glazed look in the glass that separated her from the object of her desire: CHOCOLATE. The chocolate lover never needed to see the display, unless the candy man radically rearranged or changed his selection, for she knew this machine by heart, could walk to it in her sleep and picture it in her dreams.

Second control rod from the right. Remove it, and a chain reaction would cause a chocolate bar to be released. She dreamed of the day the machine would go critical, of the time her change would cause a chain reaction whereby all the chocolate bars would fall out of the fully loaded machine.

With a well practiced backspin on each coin, she slotted the now moist silver she had carried in her hot, little hand where it said "insert exact change here" one at a time with her right hand. With perfect timing upon hearing the silence of seated coins, she forcefully pulled the rigid bar out with her left hand and let it snap back into the row. The mechanical gate opened, and dropped its anticipated contents into the lap of the machine with a thud.

She always won when she played this slot machine — almost. Occasionally it would reject her coin as if it were a slug or un-American, so she always carried more change than she needed for one selection. And sometimes, the machine would jam if she pulled the rod too soon, and she would lose both her money and her turn. She found it too embarrassing to put up a notice for the candy man to repay her; she would just swallow her losses and rendezvous with another machine across the street.

Groping at first, she snatched her prize in her fist and walked sedately back to the office. The chocolate junkie would soon be paradoxically high and sedated from the effects of her drug of choice. But guilt always set in before she reached her desk. So, like a pusher, she would tempt her coworkers by breaking rectangles off her bar and sharing. After appeasing them and relieving her anxiety, she would retire to her office to eat the rest.

After observing this form of medication for some time, I had a suggestion to break the addiction. No, not cold turkey, I reassured her. But a lunchtime during which our office would retreat to our opium den of a lunchroom to satiate our chocolate craving. We would indulge in dark chocolate of different chocolate makers, without the complicating and competing flavors of milk solids and vanilla, and the less chocolatey taste of milk chocolate. After learning what good chocolate is, I reasoned, the chocolate junkie couldn't possibly return to candy machine chocolate.

Though skeptical, she agreed to the hedonistic lunch date on February 14. What better way to spend Valentine's Day than eating chocolate, she said. I reminded her we would be tasting pieces, not swallowing whole bars. She ignored me.

All eight co-workers were invited to the sit-down, all chocolate luncheon and panel discussion, and all eight showed up, each contributing a dark chocolate bar to the cause, with one exception. The exception makes her own sweet milk chocolate hearts; though she does not start from the cacao bean, she makes a special blend and molds them herself. She brought more than one heart for each of us, so how could we refuse?

I played waitress, snapping off pieces for them to sample without telling them from which manufacturer they came. My colleagues placed each piece on their tongues, and let the cocoa butter melt in their mouths, delivering the chocolate taste and allowing it to develop and linger as the sample gradually dissolved. Then they rated it according to taste and texture. Water was drunk as a chaser.

By the time I offered the fifth chocolate on the tray to the chocola'e fiend, she cried, "Oh G O D, not more chocolate!"

Alas, the cure was only temporary, for one week later she made a beeline for the machine and the waxy, crumbly, inferior chocolate she once renounced. It is no wonder that chocolate, from the name of the cacao tree *Theobroma,* is called the food of the gods. It is hard to swear off, in whatever form you can get it.

—Marsha Belford

I-R 100 Deadline

The deadline for the 1985 I-R 100 competition, to select the 100 most significant new technical products, is March 1. "Technical product" is defined as any product, material, process, program, or system of scientific or technical origin or use. The Laboratory will pay all application expenses. For more information and entry forms, call Bill Marcuse, Ext. 2103.

NYC Train Trip

In addition to the regular Wednesday LIRR to New York City, the Hospitality Committee will sponsor a group trip to the city on Saturday, February 23. Departure will be at 8:31 a.m. from the Patchogue LIRR station. Round-trip fare for adults is $6.50; 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 no later than Thursday, February 21.

BERA News

Theater Workshop

The next meeting of the BNL Theater Group will be held on Friday, February 22, at 7 p.m. in the North Room of the Brookhaven Center. It will feature an unusual program. Two professionals, Mark Olsen and Jane Hinders, will lead a workshop in theater skills through games and improvisations. Mark Olsen is a mime who has performed in many parts of the world; Jane Hinders is a singer-actress with classical, musical comedy and jazz experience. They have been teaching for over five years in places as diverse as Pittsburgh and Paris.

As the group size is limited, attendance is on a reservations only basis. The cost is $8 per person. For reservations, call Penny Baggett, Ext. 5154, or Kurt Fuchel, Ext. 4116.

Bowling

Scotch Doubles

A Scotch Doubles Bowling Tournament is scheduled for Sunday, March 3, at 2:00 p.m. at Port Jeff Bowl. Entry blanks are available at the BERA Sales Office in the cafeteria and must be submitted by February 28. Those needing a partner, call Richard Scheidet, Ext. 5284.

Swim Club

The BNL Swim Club will meet at 5:15 p.m. on Thursday, February 21, at the pool. Members and all those who can swim at least two laps of the pool without stopping using the crawl stroke are invited to participate in a 5/8 mile workout. An optional time trial will be held after the group practice. For further information, call Marsha Belford, Ext. 3327, or Mark Catan, Ext. 2504.

Basketball

Boxscores 2/7/84

Game 1

Hollywood - 77		Longshots - 63	
R. Domemech	4	J. Gaffney	16
G. Grigg	4	J. Garrison	11
D. Hall	4	J. Gaeta	2
A. Heard	2	R. Seymore	12
G. Mack	11	P. Brown	2
E. Meier	28	L. James	8
D. Nordstrom	10	E. Taylor	3
A. Richardson	14	L. Walcott	9

Game 2

Coasters - 66		Runaways - 65	
R. Doty	26	S. Gilbert	20
F. Malone	13	T. James	18
M. Williams	11	G. Smith	6
M. Fulkerson	4	M. Tardd	17
A. Washington	10	G. Shepherd	2
L. Snead	2	T. Mooney	2

Astronomical Society

This month's observation night is scheduled for tonight, February 15, with next Friday as an alternate date. Anyone interested in participating should call Bob Mills, Ext. 5043, or Rick Jackimowicz, Ext. 3803, for details. Those wishing to join the Society should call Bob Mills.

Dance Lessons

Country and Western dance lessons will be given on Tuesday, February 19, from 7 - 8 p.m., in the North Room of the Center. The fee is $5. New and different lessons are taught each lesson. The classes are sponsored by the Singles Club, and for information, call Doris Terry, Ext. 2228.

Diners Note

The Center Club will be closed Sunday, February 17, the day preceding Washington's birthday, and will reopen on Monday, February 18 at 5:00 p.m. The cafeteria will be open from 9:00 a.m. until 2:00 p.m. on Saturday, Sunday and Monday, February 16, 17 and 18. The vended food service in Building 912 will be in operation continuously.

Cafeteria Menu

Week Ending February 22

Monday, February 18		
Snack Bar 9 a.m. - 2 p.m.		
Tuesday, February 19		
Vegetable beef soup	(cup)	.65
	(bowl)	.85
Veal patty scallopini w/egg noodles		2.20
Hungarian noodle bake & 1 veg.		2.10
Hot Deli: Chili dogs		2.15
Wednesday, February 20		
French onion soup w/croutons	(cup)	.65
	(bowl)	.85
Baked meatloaf & 1 veg.		2.10
Roasted pork loin & sweet potato		2.15
Hot Deli: BBQ chicken breast	(bread)	2.15
	(roll)	2.35
Thursday, February 21		
Pork & cabbage soup	(cup)	.65
	(bowl)	.85
Roast turkey w/stuffing		2.15
Braised beef liver w/onions & 1 veg.		2.00
Hot Deli: Philadelphia style steak w/ peppers & onions	(bread)	2.10
	(roll)	2.20
Special: Top your own 1/2 lb. hamburger		2.20
Hamburger cooked to order at grill.		
Friday, February 22		
Manhattan clam chowder	(cup)	.65
	(bowl)	.85
Chinese pepper steak on rice		2.20
Tuna noodle casserole & 1 veg.		2.10
Hot Deli: Baked ham	(bread)	2.00
	(roll)	2.20

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.

PHYSICIST. With minimum of five years' experience past PhD in experimental nuclear or atomic physics, and in beam optics, neutralization, laser-beam interactions, neutron/gamma spectroscopy and instrumentation; to join group responsible for the design and construction of an irradiation facility and related systems for the Neutral Particle Beam Project. Contact: Pierre Grand, Ext. 2038.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

2182. SECRETARIAL POSITION - Requires AAS degree in secretarial science or equivalent and excellent secretarial and communications skills. Will handle manuscript preparation, travel arrangements, expense vouchers, purchase requisitions and the ordering and maintaining of supplies. Strong word processing skills, preferable MICOM, required. Biomedical and Environmental Assessment Division. Department of Applied Science.

2183. SECRETARIAL POSITION - Requires AAS degree in secretarial science or equivalent, the ability to take shorthand and knowledge of general office procedures. Word processing skills very desirable. Contracts and Procurement Division.

2184. ADMINISTRATIVE POSITION - Requires BA/BS degree in accounting or management and 3 to 4 years' pertinent experience. Under minimum supervision will be responsible for establishing inventory requirements, their budgets and maintenance of the physical inventory. Will also monitor user accounts and coordinate plant projects. National Synchrotron Light Source Department.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2185. SCRIPT WRITER - (One year appointment). Requires BA degree in communications arts and MA degree in journalism or communications arts. Requires ability to write scripts and create instructional and educational material for video, audio and written media from source material. Experience with video tape necessary and interactive video formating desirable. Ability to obtain "Q" clearance necessary. Department of Nuclear Energy.

Autos & Auto Supplies

85 CHRYSLER WAGON - p/b, p/s, air, new battery/exhaust, am/fm, runs well, asking $750. Armin, Ext. 3104 or 4570.

WHEELS - (4) for 1985 Jaguar XJ6, brand new, boxed, orig. cost, $1,100 asking $600. 266-1688.

71 FORD VAN - V8, a/t, E-300, $700. Mike, Ext, 2023 or 585-8809 eves.

77 CHEVY VAN - 74k mi., $3,000. Ext. 7225 or 929-6748.

71 CHEVY IMPALA - a/c, p/s, p/b, V8, 82k mi., good cond., $850. Ext. 2673 or 744-8632 after 6 p.m.

77 JEEP - Wagoneer, good for parts. 981-3750.

73 PICKUP - F-100, A-1 cond., cap, many extras, $1,300. 331-5118 after 5 p.m.

77 TOYOTA CELICA - needs work, make offer. Ron, Ext. 7696 or 289-1003.

72 MUSTANG - mint cond., new brakes, muffler, carburetor, am/fm cassette. Ted, Ext. 2620.

76 BLAZER - 2 WD, 6 cyl., 3 spd., very good mech. cond., $1,495. Bill, Ext. 2807 or 281-0557.

STEREO - Audiovox, am/fm, 8 track, in-dash, $35; Audiovox power antenna, MA28, $20; speakers: Jensen, 5-1/4" 20 oz., $30; Pioneer TS100, $20/pr.; Pioneer TS107, 4", $25/pr.; Craig, 5-1/2", $35/pr., all new. Ext. 2462.

74 TRIUMPH TR-6 - conv. hardtop, blue, 4 spd., overdrive, excel. cond., $3,800; 1973 Honda 450, black, excel. cond., $400 or best offer. Jim, Ext. 3499.

73 CHEVY SUBURBAN - 3/4 ton, 6 cyl., a/t, 4 new tires, needs trans. work, driveable, $475 or best offer. 589-4407 eves.

STEERING WHEEL - custom sports-GT, chrome w/black, 14-1/2", $30; mounting kit for Ford, $5. Jon, 744-7242 after 6 p.m.

MAG WHEELS - (4) 4 lug, w/Goodyear Eagle NCT 185R70x13 tires, mounted, good rubber, $200. Eric, Ext. 2973 after 5 p.m. or 878-6469.

BENCH SEAT - for 1978 Datsun pickup, $25. 286-8448.

82 MONTE CARLO - V6, a/c, p/s, cruise, T-tops, p/windows, clean, $7,400. Joe, Ext. 5233 or 369-0432.

78 DATSUN B210 - std., minor rust, rebuilt engine, $1,200. 585-6975 eves.

TIRES - (2) Atlas Plycron, 9.00-15", tubeless, very good cond. Ext. 3075.

76 CAMARO - new paint, tires, good cond. 928-7099.

70 MAVERICK - 6 cyl., a/t, 83k, good tires & brakes, new battery, am/fm, $375. Ext. 2621 or 281-0360.

76 PINTO - 4 spd., good cond., orig. owner, $675. 399-3381.

71 DATSUN - station wagon, very rusty but runs well, $200. Ext. 4168 or 286-3675.

78 JEEP - CJ7, a/t, V8, hard top, 55k mi., $5,200. 475-4199.

76 CHEVY MALIBU - station wagon, excel. eng., good body, new brakes, tires & more, 128k mi., runs very well, $1,900. Ext. 2830 or 543-0487.

75 VW BUG - excel. cond., am/fm, snows, 2 extra rims, $1,300. Bill, Ext. 2906 or 929-6189.

69 DART SWINGER - everything new, body fair, $2,000 invested, make offer. 929-6531 after 6 p.m.

78 PINTO - p/b, am/fm, 4 spd., very good cond., $1,895. Ext. 2047 or 472-4684 after 6 p.m.

73 FORD TORINO WAGON - high mi., fair cond., $400. 286-3791 eves.

84 CHEVY CHEVETTE - 4 cyl., a/t, 2 dr. hatchback, $300 down & take over payments. 878-2239.

CHEVY WHEEL COVER - $4. Ext. 4192.

CHAINS - 7.10-15, 8.00-14, new, $20/pr; 14" rims, Dodge/Plymouth, $ ea.; 14" Chevy rim, $5. Ruppert, Ext. 3254.

83 HONDA PRELUDE - 5 spd., a/c, am/fm cassette, rust proofed, p/moonroof, body molding, red, excel. cond., $10,500. 422-1846.

74 VW BEETLE - rebuilt engine, am/fm, (2) extra snow tires, new battery, good cond., leaving for Europe, $1,200. Edith, Ext. 4379 or 3002 after 8 p.m.

Boats & Marine Supplies

23' O'DAY - 1982, 7.5 HP Mercury, lots of equipment, 4 sails, A-1 cond., asking, $14,500. 473-1067.

FRIENDSHIP SLOOP - glass over wood, new deck, new jib, staysail, sleeps 2. Ext. 7225 or 929-6748.

20' O'DAY - 6 HP, galvanized trailer, K/CB, sleeps 4, heard, galley, extras, ready to sail, excel. cond., $6,800. Ext. 2906 or 929-6189.

22' CATALINA - 1982, swing keel, head, galley, extras, meticulously maintained. 589-5490.

Miscellaneous

TYPEWRITER - electric, Smith Corona, script letters; brown touch tone, trim line wall phone; Hedstrom stroller; (2) traditional octagonal shaped end tables; hi-riser bed; solid ponderosa pine louver door (30x80). 751-6418.

REFRIGERATOR - top freezer, 19 cu. ft., 31w x 29d x 60h, good running cond., $100. Ext. 7505 or 689-8605.

QUASAR VCR - excellent cond., w/remote, only 6 months old, $350. Mike, 331-5042.

KITTEN - Siamese Sealpoint, 7 wks. old, male, litter trained. Lois, Ext. 2959 or 286-8291.

FISHER FVH VCR - 615, 105 channel, cable ready, 9 day, 8 functions. 475-6938.

BICYCLE - woman's, Schwinn, 26" balloon tires, coaster breaks, w/auto carrier, $50. John, Ext. 4153.

TORO SNOW THROWER - single stage, gas; Singer sewing machine; wooden storm windows, $12. 472-1397.

CATALYTIC HEATER - 5,000 btu, uses Coleman white gas, $40. Ext. 4098.

SWEATER - man's winter, medium, new, $8; bath towel set, new, $5. Susan, Ext. 4267.

EARTH STOVE - A-1 cond., stack kit, wood/coal burning, $375. 588-4703 after 5 p.m.

PIANO & BENCH - 84 Wurlitzer upright, walnut finish, only 2 months old, cost $1,823, sell for $1,450. Ext. 2823 or 3187.

BRASS BED - antique, twin size, asking $225. 654-0810.

BICYCLE - Motobecane Grand Record, 25", Reynolds 531 D.B. throughout, campy dropouts, derailleurs hubs, T.A. crank, Cinelli stem, excel. cond. Ext. 4206.

GRAMS BEARS - handmade, $35. Terri, 878-9102.

MS PAC MAN - the origional video game, $400. 399-2342 after 5 p.m.

CORNET - Olds Ambassador w/case, $100. Jim, Ext. 3372.

GOAL TENDER - ice hockey, Pro-Equip, $500 value, will sell for $200. Edward, 363-5170.

BMX MONGOOSE BIKE - alloy cranks, proneck, KKT lightning pedals, zap pads, $115. Dave, 821-0250.

CAMERA - 35 mm, Autoreflex-Konica T3 w/75-150 mm zoom lens, $200; 19" Sylvania color TV, $75; intelevision w/2 games, $75; men's golf clubs, Haig Ultra Irons, 2 thru wedge. $50; Russian built 35 mm camera w/case, $50; 19" GE b&w TV. 286-8448.

BEDROOM SET - French Provincial, 5 pcs., all wood, good cond. 325-9580 after 6 p.m.

FURNITURE - 5 drawer chest, youth bed, spring & mattress, $80; 6 pc. contemporary bedroom set, $300. Inan, Ext. 3370.

COLECOVISION - excel. cond., used only a few times, 2 cartridges, $90. Ellen, Ext. 4486.

BEDROOM FURNITURE - (2) end tables, man & woman's dresser, mirror, all solid wood, dark Colonial, $200. Bob, Ext. 2957.

HAM OPERATORS - HW16 tranceiver, VFO, antenna tuner, SWR meter, coax switch, $200. Oster, 589-2648.

VIOLIN - 1/2 size, Italian, $250; camera, Kodak-Retina II-A, 50 mm - f/2 lens, $60; skis, Kneissl Epoxy, 215 cm, bindings, Scott poles, $50; size 12 boots & carrier, $25; hockey skates, size 12, $15. Corliss, Ext. 4438 or 472-1585.

BABY ITEMS - swing, $10; walker, $5; car seat, $5; Johnny jump-up, $2. 924-8160.

CABLE TV TUNER - RCA, receives all unscrambled channels, $40. Ext. 4153 or 732-5829.

WEDDING GOWN - Lace bouffant, pearls/sequins, 4 tiers front, 6 back, like new, size 10, $65. Ext. 2733.

SKI BINDINGS - Tyrolia 360R w/brakes, never used, $65. Mark, Ext. 4031.

GRAPHIC EQUALIZER - Tamon, 10 band/channel, good cond., $60; turntable, Technics SLD2, direct drive, semi-automatic, Audio Technica cartridge, good cond., $60. 981-0011.

CRIB - & mattress, $40; convertible carriage, $20; twin bed headboard, $15. Ext. 3084 or 399-4394.

PICNIC TABLE - alum. fold up, for 4 people, new in box, $35. Chuck, Ext. 5317.

BABY SWING - Swingomat, $5; baby rocking chair, $8. Manfred, Ext. 3422 or 4440.

INFANT CAR SEAT - Deluxe Strollee w/tether, $30. Phil, Ext. 3913 or 475-8099.

MOVIE PROJECTOR - 16 mm, sound, Singer model, new cond., $225. 878-9256.

CRIB - & mattress, white, $27; high chair, $14; pink Big Wheel cycle, $8. Maria, 821-1435.

GOLF CLUBS - (12) bag, balls, $50. 325-9590.

BATHROOM SINK - pink w/faucet, $15. Ext. 4192.

STEREO TAPE DECK - Pioneer RT-909, auto-reverse, open-reel, 2 spds., many extras, $450. Ext. 3992 or 331-1003.

Free

JAPANESE LESSONS - lunch time, Tuesdays, Bldg. 815, conference room, beginners welcome, starts March 5, free. Gamo, Ext. 2823.

CAT - tan & white, male, 8 mos. old, altered. Ext. 5148.

Car Pools

BAYPORT/BLUE POINT - forming on time carpool, two drivers/riders needed. Rick Wilke, Ext. 3932.

SUNY CAMPUS AREA - need ride from campus area or Setauket, will pay. Sean, Ext. 4283 or 751-1296.

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

STONY BROOK VILLAGE - 2 rm. apt., magnificent view of LI Sound, newly decorated, $575 includes all. 751-8210.

STONY BROOK - 6 bdrm. house, Jacuzzi, gazebo, lg. yard, 1 mi. north of Stony Brook RR, $1,200 plus util. 751-8210.

HUNTINGTON - close to Northern Pkwy., 2 bdrm. apt., full finished basement, fenced yard, garage, $725/mo. Ext. 3698 or 421-4891.

SOUND BEACH - 3 rm. apt., $400 incl. util. & cable. 821-1059.

MT. SINAI - Rustic area, 3 bedrms., heated porch, basement, l/r, working kitchen, $800/mo. 744-8013 eves.

SOUTH BLUE POINT - studio apt., $475. Ext. 4846 or 363-6940 after 5 p.m.

SETAUKET - large sunny apt., 1 bdrm., l/r, kitchen, bath, pri. entrance, large property, walk to SUNY, $450/mo. & util. 751-8240 eves.

SETAUKET - farm ranch w/porch, appliances, walk to SUNY, 1 acre property, will rent monthly if desired. 751-8240.

STONY BROOK - 4 bdrms., 2 baths, den, l/r, d/r, walk to SUNY, $925/mo. & util. 751-8240.

MASTIC BEACH - apt., 2 rms. & full bath, ground level, partially furn., $400/mo. incl. util. Joann, 744-2821.

For Sale

NORTH CORAM - townhouse, w/w, fenced yard, washer/dryer, 1-1/2 baths, 2 zone heating, oil hot water, club house, swimming pool, redwood deck, $77,000. 331-5118.

MILLER PLACE - colonial, 4 bdrms., formal l/r, d/r, country kitchen, 4 baths, fam. room w/brick wall fireplace. 331-1718.

OCALA, FLORIDA - 3 bldg. lots, approx. 3 acres, in "Rolling Hills", Marion Co. Fla., 80 min. from Orlando, 40 mi. from Gainesville, w/lakes, parks, stables/tennis courts, $6,000/lot. Ken, Ext. 2008 or 928-5875.

MASTIC - 4 bdrms., 2 full baths, split level, fam. rm., basement, 2 car garage, patio, shed, fenced, nicely landscaped, many extras, move in cond., $88,000. Ext. 3589 or 281-3635.

LADY LAKE, FLORIDA - CB home on 1 acre, 2 bdrms., 2 baths, lrg. l/r, TV rm., screened patio, a/c, heat, $62,500. (904) 753-3494.

LAKE PANAMOKA, RIDGE - super mint ranch, 3 bdrms., l/r, d/r, eik, cathedral ceiling in l/r & d/r, 6" ext. walls & extra insulation, A.G. 18' pool & deck, lake rights, 5 min. to Lab, $91,000. 929-8748.

Wanted

SLIDE PROJECTOR - Bell & Howell, slide cube type, reas. price & cond. Bill, Ext. 2378.

LOBSTER POTS - Gilbert, 473-9016 day or eves.

APARTMENT - mother/daughter, 2 bdrm., Patchogue Village only, $539 to $550 w/util., March or April. 289-5172 after 3:30 p.m.

ROOM ON SITE - at lunchtime for BERA chess meeting for approx. 15 to 20 members. Kim, Ext. 7110.

X-COUNTRY SKIS - fiberglass, reasonable. 727-0082 after 5 p.m.

TIRES - Michelin or Pirelli size 195/70-14 or CR78-14. Ext. 4393 or 589-3272.

COLOR TV - 19"; Kodak Carousel 35 mm slide projector. Ext. 4108.

DIRT BIKE - for 13 yr. old. Frank, Ext. 2314 or John, 567-5131 after 3 p.m.

MECHANICAL WATCHES - working or not, clocks, coins, and old jewelry by collector/watchmaker. Al Campbell, Ext. 2043.

CAMPBELL'S SOUP LABLES - send to F. Chandler, Bldg. T-89, for St. Mary School, E. Islip.

POSTAGE STAMPS - for Lutheran Church program, should have 1/4" of envelope around stamp. Al Campbell, Ext. 2043.

TODDLER BACKPACK - & rocking horse. Annette, Ext. 3190.

TRAINS - Lionel, any "0" gauge or "027" gauge cars, track & equip. Frank, Ext.a 3120.

TIRE - F or G x 15", not radial, for spare. Morris, Ext. 4192.

Lost & Found

LOST - child's blue tennis shoes in apt. area/Recreation Bldg. Ext. 2667.

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 ☐ Lost & Found ☐ Wanted ☐ Free ☐ _____

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).