

## DNI Lecture

### STEM: From The Ground Up

STEM is a small word which represents a great capability for seeing the minute world of atoms and molecules. How the Scanning Electron Transmission Microscope works and how it is expected to contribute to the study of biological structure, will be discussed by biophysicist Joseph Wall in the 163rd Brookhaven Lecture.

"Counting Atoms, Weighing Molecules" will be his topic and he will speak at 8 p.m. in Berkner Hall on Wednesday, February 28.

The conventional electron microscope works much like a light microscope, illuminating the specimen with electrons instead of light, and using lenses to form a magnified image. Although many electron microscopes can now operate at a resolution of 2 angstroms (20 billionths of a centimetre), the resolution with biological samples is usually at least 10 times poorer because of damage by the imaging electrons. Thus, much of the fine structure of biological systems cannot be seen with the electron microscope.

When Albert Crewe and his coworkers at the University of Chicago demonstrated the visibility of single heavy atoms and unstained biological molecules with a newly developed STEM, it seemed that this barrier was about to be overcome. The strategy was to tag sites of interest in the molecule with heavy atoms, observe both the molecule and tags with the STEM, and deduce the structure. However, the heavy atoms were observed to "fall off" the molecule when the electron beam struck it and then move randomly. This random motion was so great that the starting positions of the atoms could not be determined.

"Our efforts to overcome this problem in heavy atom tagging began in 1972 with the design and construction of a new instrument," says Wall. "The Brookhaven STEM differs from its predecessors in being able to cool the specimen to  $-140^{\circ}\text{C}$  in order to reduce atom motion. It is also equipped to perform precise measurements of electron-specimen interactions in addition to producing images."

STEM has been in full operation since



Joseph Wall  
—photo by Humphrey

late 1977 and its most important contribution to date has been in the application of its quantitative measurement capability to better understand and overcome the problems previously encountered in imaging heavy atoms attached to biological molecules. Advances such as cooling the specimen, "weighing" molecules and developing techniques to increase the visibility of tags, are all leading to solving the problem of applying heavy atom stains for biological structure studies.

Currently, STEM is being used not only by BNL staff, but by biomedical scientists from the eastern United States. The active users' program is supported by the NIH Biotechnology Resources Branch.

Wall has been primarily involved with STEM since he came to Brookhaven in 1973 after a two year postdoctoral appointment at the Enrico Fermi Institute, Uni-

(Continued on page 2)

## Energy Analysis Forum Established

How would it affect world oil markets and the United States if coal or biomass-based liquid fuels became available by 1990 at competitive prices, or if consuming countries could mitigate oil usage through conservation? What is the effect of U.S. policy on world oil supply and demand? These and similar questions must regularly be faced by the Department of Energy office of the Assistant for Policy and Evaluation.

To survey analytical capabilities applicable to such problems and to discuss current problems in policy analyses, BNL's National Center for Analysis of Energy Systems brought together analysts from universities, industry and government in an Energy Policy Analysis Forum (EPAF). Following an organizational meeting in November, the first working meeting was held in Washington on February 7 and addressed "World Oil Analysis." It was attended by nearly forty persons from such institutions as Harvard, MIT, Stanford, Exxon, Standard Oil of Indiana, and the Department of Energy.

They met to discuss methods of analyzing the world oil supply and demand situation as it may develop over the next several decades. Analysis is performed for forecasting purposes, but also defines opportunities for and consequences of actions by the many participants in energy markets. Indeed, several of the most interesting questions dealt with the modeling of uncertainties and intangibles.

A difficult uncertainty and the need for its accommodation by the analytical process was stated by persons with first hand experience in the Middle East. Oil producing nations have access to economic analyses that are well understood here, but they may also view decisions from the standpoint of Islamic ethics. These ethics are

sensitive to concerns about the distant future of the region, draw their scripture from the year 600 A.D. and reject as immoral such western concepts as interest on money.

Another type of uncertainty and one addressed by several energy models, including those used at Brookhaven with detailed technological capabilities, dealt with the "backup price" for oil, i.e., the price at which competitive sources take over markets from conventional petroleum fuels. The use of coal to generate electricity, the extraction of oil from shale, and the use of solar energy for residential heating, all imply long term limits on the price of oil when these alternatives are available. The models allow for the timing, quantity, and cost of these alternate sources, and show the significant impact of these technologies in the long term. Unfortunately, they are not available in sufficient quantity to influence the near term situation.

Other questions remain difficult for current methodologies to handle. The feedback of rising energy prices on economic growth and its associated fuel demand is the subject of active research at Brookhaven. The interaction between international oil purchases, currency exchange rates, and money markets is most complex. Some new analytical approaches using game theory were described by participants.

The Forum meetings were organized by NCAES Head Ken Hoffman, assisted by Center staff Pat Towey, Paul Groncki, and Bill Graves, in collaboration with Roger Naill, of DOE's Office of Analytical Services. The Forum is expected to meet three or four times a year in Washington to survey a series of important topics in energy policy analysis.

## Clearing The Site For ISABELLE



The first construction contract for Project ISABELLE was awarded by the Contracts & Procurement Division (DCP) to Danny Tew Excavating, Inc., a small firm in Patchogue, for the grubbing and clearing of approximately 200 acres of land at the future site of the accelerator. Implementing Lab Director George Vineyard's commitment to stress minority participation at the Project, Mr. Tew subcontracted part of the work to Jim Rudd, an excavating contractor from Hempstead. Above, from lower left clockwise, are Mr. Tew; William Rogers, DCP Sr. Contract Specialist; Mr. Rudd; and E. Parke Rohrer, Head ISABELLE Construction Division. —photo by Reben

## Focus On Black History

Each year, the month of February is designated as "Black History Month" and is sponsored by the Association for the Study of Afro-American Life and History (ASALH), a Washington, D.C. based organization founded in 1915. "Black History Month" is a period during which attention is focused upon the historical background and contributions of the black American. The theme, "History: Torch to the Future" has been chosen for this year's observance. The Association promotes black historical research and writing and publishes works on that subject, in addition to supporting other goals and programs relating to black history and life.

To test your knowledge of black history, the *Bulletin* prepared the following quiz. How many of these notable black men and women from past or current history can you identify with their accomplishments? Answers on Page 2.

- |                                |   |
|--------------------------------|---|
| 1. Henry Blair.....            | A) First black to earn a Ph.D. from a U.S. University (Yale) and first elected to Phi Beta Kappa, 1876  |
| 2. Edward Bouchet .....        | B) Undersecretary of U.N. and first black to receive Nobel Peace Prize, 1950  |
| 3. Ralph Bunche .....          | C) Co-founder "Freedom's Journal," New York City, nation's first black newspaper  |
| 4. George E. Carruthers .....  | D) Poet and first black from U.S. to have works published, 1761   |
| 5. Shirley Chisholm .....      | E) Pulitzer prize winning black writer and author of "The Autobiography of Malcolm X"   |
| 6. Henry O. Flipper .....      | F) Founder and first president of Tuskegee Institute 1881   |
| 7. Arthur Haley .....          | G) Led legal action which won an historic Supreme Court decision declaring racial segregation of public schools unconstitutional, 1954; first black Supreme Court justice, 1967 |
| 8. Jupiter Hammon .....        | H) First black woman elected to House of Representatives, Brooklyn, NY, 1968  |
| 9. William A. Hinton .....     | I) Black leader of most significant slave revolt in U.S. history, 1831  |
| 10. Pvt. Henry Johnson .....   | J) Obtained patents for corn-planter (1834) and for cotton planter (1836), believed to be the first patents issued to a black   |
| 11. Thurgood Marshall .....    | K) First black to graduate West Point, 1877   |
| 12. Pedro Alonzo Nino .....    | L) Navigator of "Nina," one of Columbus' ships on voyage to New World, 1492   |
| 13. John B. Russwurm .....     | M) First black professor at Harvard Medical School, 1949  |
| 14. Nat Turner .....           | N) Black doctor who performed one of first two open heart operations, 1893  |
| 15. Booker T. Washington ..... | O) First U.S. soldier decorated by France in World War I with "Croix de Guerre"   |
| 16. Phillis Wheatley .....     | P) First black woman to have literary works published in U.S., 1770   |
| 17. Daniel Hale Williams ..... | Q) 19th century black inventor who devised the third rail system now used in subways, a railway telegraph safety device   |
| 18. Granville T. Woods .....   | R) Black physicist who developed the Apollo 16 lunar surface ultraviolet camera/spectrograph  |

## BNL Hikers In From The Cold

On the morning of Friday, February 9, Steve Munson, Chuck Calef and Tom Owens began what they thought would be a challenging, but not impossible, 36-mile trek by cross-country skis over the Northville-Lake Placid Trail in the Adirondacks of New York State. They covered 8½ miles the first day out, about 2 miles shy of their anticipated 10 miles per day. The three set up their tent for the night inside a shelter on the trail near Long Lake. That night, temperatures fell to -35°F.

Water had to be melted on stoves so that dinner could be cooked, and the three - almost fully clothed - remained in their sleeping bags all night. It was so cold at daybreak on Saturday when Munson, Calef and Owens awoke that even the gas stove wouldn't light readily. "The yellow light of the stove, the vapor of our breath and the frost which accumulated inside the tent made for a very eerie atmosphere," Munson said.

That morning, Munson decided to return to the trail's starting point because the extraordinary cold was much worse than he'd prepared for. Calef and Owens, however, endeavored to complete the hike.

When Munson's companions did not meet him at the trail's end on the third day as planned, he left notes for them at various places where they might be likely to check in the village of Lake Placid. Munson also checked the designated meeting spot every hour. That day, however, the two hikers did not turn up. At 9 p.m., Munson reported them missing to a Lake Placid forest ranger.

The ranger went out in a light plane and spotted Calef and Owens about one-half mile off the trail. He dropped a note to the hikers who returned the signal that they were "Okay." Ten minutes after the plane left them, however, the two realized that inaccurate maps and markers caused them to lose the trail. "We were lost," Owens said, "and we regretted we'd waved him on."

The persevering hikers backtracked to the last trail marker which they were sure of and after a few minutes of searching that site, Owens and Calef regained the Northville-Lake Placid Trail. The two completed the hike two hours later and rejoined

a relieved Munson in the village of Lake Placid.

"We had to get out that day," Owens commented, "our sleeping bags were drenched from the night before when extreme cold forced us to sleep curled up with our heads enclosed in our sleeping bags. We couldn't have used them another night," he said. In fact, the hikers later found out that Saturday night, the lowest recorded temperature in the U.S. was reported in Lake Placid - it was -49°F. Hypothermia, frostbite and exhaustion were very near dangers faced by the two.

Was it worth it? "The hike was more mentally than physically demanding," Owens concluded. "Like any experience, you remember the good parts: for instance, we had exceptionally clear, sunny weather. It began as a normal weekend trip," he said, "but became an epic of survival."

## Stony Brook Events

### Monday, February 19

Recital: Graduate String Quartet, 8 p.m., Recital Hall, Fine Arts Center. Call 246-5671 for more information.

Speaker: Manny Hillman, BNL chemist, "Strained Ferrocene Derivatives/Squeezing the Iron Atom," 5 p.m., 412 Graduate Chemistry.

### Wednesday, February 21

Recital: Percussionist Daniel Kennedy, 8 p.m., Recital Hall, Fine Arts Center.

Film: "Bob and Carol and Ted and Alice," 7 and 9:30 p.m., Stony Brook Union Auditorium. Tickets: 50¢ available at door or at Stony Brook Union Ticket Office.

### Friday, February 23

Recital: Pianist Steven Rosenfeld, 8 p.m., Recital Hall, Fine Arts Center.

### Saturday, February 24

Disco: "Chic - A Disco Extravaganza," 9 p.m., Gym. Call Student Activities Board at 246-7085 for further information.

### Sunday, February 25

Recital: Violinist Ellen Zahringer, 3 p.m., Recital Hall, Fine Arts Center.

Recital: Flutist Betsy Heinrich, 8 p.m., Recital Hall, Fine Arts Center.

## "The Gingerbread Lady" At BNL



The BNL Theatre Group presents "The Gingerbread Lady," a comedy-drama by Neil Simon, on the weekends of March 2 and 3 and again on March 9 and 10 in Berkner Hall. Here, Evy (Jane Love) in foreground rejects her former lover, Lou (Ron Ruth), as he attempts to regain her interest. Tickets for the production are available at the door prior to the 8:30 p.m. curtain.

—photo by Reben

## BNL Lecture

(Cont'd)

University of Chicago. He holds a B.S. degree in physics from the University of Wisconsin and a Ph.D. in biophysics from the University of Chicago. While a graduate student at Chicago, he was active in the design and construction of the prototype STEM under Professor Crewe's direction. He is currently a director of the New York Society of Electron Microscopists. To take a break from microscopy, he plays the violin in Long Island chamber and symphony orchestras.

A buffet supper is served at 6:30 p.m. at the Brookhaven Center before the lecture. It is convenient and many have found it a pleasant way to mingle with people from departments other than their own. Those who wish to stay after work for the buffet should make reservations in advance by calling Ext. 3541 before 5:00 p.m.

## Answers To Quiz

1. J; 2. A; 3. B; 4. R; 5. H; 6. K; 7. E; 8. D; 9. M; 10. O; 11. G; 12. L; 13. C; 14. I; 15. F; 16. P; 17. N; 18. Q

## BERA

### Committee Named

At its January meeting, the BERA Board appointed a committee to nominate a slate of candidates for the 1979 BERA Board Election. Those appointed to the committee are: Charles Bohnenblusch, Accelerator; David Comstock, Chemistry; Joanne DeLise, S&EP; Angela Garcia, Contracts & Procurement; Sheldon Katz, Central Shops; Steve Munson, Energy & Environment; Lawrence Passell, Physics; Marie Susa, Medical; Nelson Tyler, Supply & Materiel; and Gail Waite, Nuclear Energy.

The committee members are now considering possible candidates and will meet on Tuesday, February 27 to present and discuss the qualifications of their choices. Final selection will be made at the meeting.

Any employee who wishes to suggest a candidate is encouraged to do so by contacting a member of the committee before February 22.

## Notes On War And Weather



Army recruits were photographed during a training session at Camp Upton in 1918 in what appears to be a rather informal atmosphere. The barracks in the background were built by construction crews who apparently "battled not Kaiser Wilhelm, but sleet storms, rain and unrelenting cold," during the winter of 1917-18. Between late December and early January, temperatures ranged from a high of 7°F. above zero, to a low of 13°F. below zero, according to a Quogue diarist of that time. It is said that Yaphank is usually colder than other parts of Long Island, so it is likely that the crews worked in temperatures well below those re-

ported above. BNL's climatologist, Connie Nagle, says her records confirm that the area was two degrees below the mean average for Long Island in the winter of 1917-18. This site is still a cold spot. On Monday, BNL recorded the coldest temperature on Long Island - 7.5 degrees below zero. The photograph and World War I data were supplied by Russell V. Carman, Village Historian of Quogue, whose father owned the construction company responsible for building the barracks. Russell Carman is also the father-in-law of Per Dahl (Project ISABELLE).

## Arrivals & Departures

### Arrivals

Francis X. Bock..... Accelerator  
Irene F. Brusca..... Ph. & Gr. Arts  
Conrad L. Foerster..... Accelerator  
Robert F. Lambiase..... Accelerator  
Alfredo U. Luccio..... Accelerator  
Michael D. Mapes..... Accelerator  
Thomas V. Moresco..... Nuclear Energy  
Francis S. Ogilvie..... Physics  
Kenneth J. Orsini..... Central Shops  
Gary S. Perri..... Accelerator  
Lorraine P. Titus..... Fiscal  
Hilde Weber..... Supply & Materiel  
James C. Wilson..... Accelerator

### Departures

James Florakis..... Accelerator  
Horn-Ing Liou..... Physics  
Maurizio Ribera D'Alcala..... Energy & Env.  
Pauline D. Smith..... Safety & Env. Prot.

## Pool To Close Early

Due to the adverse weather conditions on Wednesday, February 7, the refresher training class for BNL lifeguards was cancelled and has been rescheduled for Wednesday, February 28. On that evening, swimming pool hours for employees and their families will be from 5:00 p.m. to 7:30 p.m.

## I.B.E.W. Meeting

Local 2230, I.B.E.W. will hold its regular monthly meeting on Feb. 26, 1979, at 8 p.m. in the Knights of Columbus Hall, Railroad Ave., Patchogue. There will also be an afternoon meeting at 2 p.m. for shift workers in the Union office at 31 Oak Street, Patchogue. On the agenda will be regular business, committee reports and the President's report.

# BROOKHAVEN BULLETIN

Published weekly for the employees of  
BROOKHAVEN NATIONAL LABORATORY

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## Letters To The Editor

To The Editor:

The other day I discovered another reason besides safety for unplugging certain appliances when not in use. While working in my home workshop, the back of my hand came in contact with a small jig-saw, which has an on-off switch and which I normally had always left plugged into the socket. Although the saw was properly grounded and I got no shock, I was very surprised to feel a vibration at a frequency that I guessed was probably 60 Hertz; (no hum was audible). Sure enough - as soon as I disconnected the plug the vibration stopped. After thinking about this I concluded that this saw, which I knew used a solenoid rather than a motor to cause the blade to vibrate, apparently must have in it a transformer or at least some kind of a choke coil shunt, and the on-off switch is evidently on the secondary side of the transformer.

In any case, it is obvious that the saw was using at least a trickle of current all the time that it was plugged in, even when it was not being operated. I doubt that the current used was very much, but in these days when we are trying to conserve as much energy as possible, I think it is deplorable that a manufacturer would make a device like that without at least labelling it with a notice that the cord should be unplugged when not in use.

Lou Stang

## Emergency Closings

The following radio stations will carry notification of BNL delayed openings and emergency closings:

Station	Area	AM	FM
WBAB	Babylon	1440	102.3
WGLI	Babylon	1290	-
WLIX	East Islip	540	-
WHLI	Hempstead	1100	98.3
WGSM	Huntington	740	-
WALK	Patchogue	1370	97.5
WBLI	Patchogue	-	106.1
WRIV	Riverhead	1390	-
WRCN	Riverhead	-	103.9
WLNG	Sag Harbor	1600	-
WWRJ	Southampton	-	95.3
WHN	New York	1050	-

## Hockey Note

Those holding tickets to upcoming Islanders hockey games should note the change in the starting time of the following games: Islanders/Detroit, Sat. 2/24, 1:15 p.m.; Islanders/Philly, Sat. 4/7, 1:15 p.m.

## ENGINEERS



People Bringing Purpose to Progress

National Engineers Week - February 18-24

## Safety First



Electrician Warren Baumbach (right) was testing a circuit in Bldg. 911 when there was a short and a flash-up. Because he was wearing safety glasses, his eyes were not damaged. Last week he received the Wise Owl Award from Al Mahlmann, Superintendent of the Electrical Division, Plant Engineering. —photo by Reben

## Volleyball

### Mixed League

#### Division A

On February 5, Oceanography swam over the Diamonds: 15-0, 15-7, 15-3. Nuts & Bolts shone over Nuclods: 15-13, 13-15, 15-5. No Names edged out the Popovers: 15-1, 15-9, 17-15. Family Affair & Lookin' Good: snowed out.

#### Standings

Oceanography	18- 0
No Names	14- 4
Family Affair	10- 5
Nuts & Bolts	10- 8
Lookin Good	8- 7
Diamonds	7-11
Nuclods	3-15
Popovers	2-16

#### Division B

Leftovers swept Medical: 15-4, 15-5, 15-17. LeMufs over Balls & Strikes: forfeit. Nads beat the Wisas 15-13, 13-15, 15-11.

#### Standings

Medical	7- 2
Balls & Strikes	6- 3
Leftovers	6- 3
Nads	4- 5
LeMufs	3- 6
Wisas	1- 8

## Bowling

### Pink League

Marge Stoekel is testing a new formula and it seems to be working: she topped last week's 489 with a 191 game and a 497 triple this week.

Barbara Cochrane's new ball gave her a 200 game, hopefully the first of many.

Good games were bowled by Ellie Kristiansen 187, Renie Rosati 177, Carol Beckner 168, Marie Grahn 165/163 and Pat Lebitski 161.

### Red League

The Anachems won 8-3 over the Sandbaggers and lead the Red by 9 points. R. Wilson had a 545-626 series. C. Bohnblusch (210) had a 553-628 series, R. Jones a 201. The only other team to get any points was the Designers who split 6-5 with the Sparks. C. Cantera had a 203.

All other teams were skunked by the Green League. The Old Timers lost 11 to the Blue Jays. R. Smol (213) had a 615 gross, W. Reams grossed 611. A great night for R. Marlow (228-210) 588-678 series,

## May Rally For Bikers

Not too many people think about bicycling this time of year, but if you want to get in on an inexpensive bus ride to GEAR, the gigantic Memorial Day Weekend get-together for cyclists, you must act now.

This year, the Great Eastern Rally will be held in Harrisonburg, Virginia, and an attendance of several thousand is expected. The daily and longer rides will be interspersed with evening activities. Excluding transportation, the Rally costs about \$67 for 4 days including dormitory housing at James Madison University and eight full meals in the school cafeteria.

The Suffolk Bicycle Riders Association is organizing a bus ride to GEAR and about a dozen non-members can be accommodated. Contact Gerry Morgan, Ext. 4841 for details.

## Nursery School

Openings are available in both the three and four-year old classes at the Upton Nursery School. For further information, call Marie Murtagh at 821-9587.

but the Freon Loaders were shut out 0-11 by the Old Timers II.

The 76'ers also wound up with zero against the Cosmos. R. Larsen (213) had a 568-604 series and M. McKenna grossed 605. This Isa Team was skunked 0-11 by the Pinball Wizards. R. Barberich had a 205 and grossed 605.

### Purple & White League

The Portsiders Plus 1 moved into first place and The Aquanauts took over second. We had three 600 series this week: Ed Meier rolled a 194/236/216-646 series, Caryl Mac Dougall 223/187/203-613 series, and Bob Jones 210/196/201-607 series. Other good games were bowled by Jim Griffin 207, Ed Sperry 199, Al Pinelli 198/196, Betty Jellett 198, MaryGrace Meier 187, Fran Brown 173, and Lillian Cahill 170.

### Gold League

High games for the evening were bowled by Lyndora Boyd 183 and Marsha Kipperman 181/161. Congrats to Bea Pyatt for converting the 3-7-10 split and to Betty Roche for the 4-7-10.

## COOL IT!

65° by Light; 55° by Night.

## Diners Note

The Center Club will be closed Sunday, February 18, the day preceding Washington's Birthday. However, it will be open on Monday evening, February 19 at 5 p.m.

The Cafeteria will be open from 9:00 a.m. until 2:00 p.m. on Saturday, Sunday and Monday, February 17, 18 and 19.

The Vended Food Service in Building 912 is in operation continuously.

## Cafeteria Menu

Week Ending February 23, 1979

<b>Monday, February 19</b>	
Snack Bar Service	9:00 a.m. to 2:30 p.m.
<b>Tuesday, February 20</b>	
Corn chowder	(cup) .30 (bowl) .40
Beef chop suey on rice	1.30
Scrambled eggs, sausages and fr. fr.	1.15
Hot Deli - Turkey	(on bread) 1.30 (on roll) 1.40
<b>Wednesday, February 21</b>	
Cream of potato soup	(cup) .30 (bowl) .40
Braised meatballs à la mode w/buttered noodles	1.30
Broiled filet w/fr fr.	1.35
Hot Deli - Roast beef	(on bread) 1.30 (on roll) 1.40
<b>Thursday, February 22</b>	
Chicken vegetable soup	(cup) .30 (bowl) .40
Cheese ravioli and 1 veg.	1.10
Sauerbraten and potato pancake	1.45
Hot Deli - Grilled Reuben	1.30
<b>Friday, February 23</b>	
Fish chowder	(cup) .40 (bowl) .50
Spaghetti w/clam sauce	1.15
Breaded pork chop and 1 veg.	1.50
Hot Deli - Smoked baked ham	(on bread) 1.30 (on roll) 1.40

## Phys Rev Lists Job

Assistant to the Editor, The Physical Review - to assist the editors (primarily Physical Review A, General Physics) in processing manuscripts for publication. Physics background at the B.S. to M.S. level or equivalent required. Address inquiries to the Managing Editor, The Physical Review, Brookhaven National Laboratory, Upton, New York 11973.

## 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.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific 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, as indicated below. Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Personnel Placement Supervisor, Ext. 2882.

**OPEN RECRUITMENT:** Opportunity for present Laboratory employees and outside applicants.

**923. COMPUTER OPERATOR** - Requires AAS in data processing or successful completion of computer operations training program or equivalent experience in computer operations. Will be working with IBM 360/30 and Hewlett Packard equipment. Must be willing to work nights. Administrative Systems and Data Processing Division.

**924. SYSTEMS/DP ANALYST (two positions)** - Requires a bachelor's degree or equivalent capabilities and experience in COBOL. Responsibilities will include design and implementation of on-line business applications. Experience with structured design and data base concepts highly desirable. Good written and oral communications skills are required. Administrative Systems and Data Processing Division.

925. PROGRAMMER - Requires BS in computer science or equivalent capabilities. Knowledge of FORTRAN and experience with graphic applications in computer output microfilm equipment helpful. Must be willing to work day, nights, or rotating shifts. Photography and Graphic Arts Division.

926. PATROL OFFICER TRAINEE - AAS in police science/criminal justice or equivalent capabilities. Familiarity with the operation of a security department. Excellent written and oral communications skills required. Must be willing to work shifts. Safety and Environmental Protection Division.

927. OFFICE SERVICES ASSISTANT - Requires excellent typing skills, good general office skills. Must be able to respond to constantly changing priorities. Six month position. Department of Energy and Environment.

### Autos & Auto Supplies

75 CHEVY LONG BODY VAN - ps/pb, a/t, V8, carpeting, sun roof, lug rack, AM/FM, CB, radial tires, excel cond. Don, Ext. 3533.

TIRES - (3) E70-14, (2) E78-14, (1) 7.35-14, (2) D78-14, 7.50-14 w/rim, good for spares. \$3-10. Rich, Ext. 4172.

69 REBEL SST - 6 cyl, ps, excel cond. \$800. Ext. 3096 after 6.

75 BUICK ELECTRA - white w/blue corduroy int, excel cond. \$4000 or best offer. Mike, 727-8929 after 6.

69 FORD 390 ENG - good running cond. \$150. Ext. 4539.

SNOW TIRES - new Michelin 165R15 snows. 2/\$90. Ext. 4727.

RIMS - Chevy 14". 2/\$9. Leo, Ext. 4688.

69 PONTIAC - Bonneville 2 dr, 87,000 mi, snows on extra rims, a/c. \$400. Ron, HA3-7714.

68 COUGAR 302 - 4 spd, mags, gauges, air shocks, traction bars, more, must sell, needs minor work. \$500. Chris, Ext. 4612, 281-7379.

69 COUGAR - good cond. Asking \$625. Sharon, Ext. 3793 or 878-2591 after 6.

69 PONTIAC LEMANS - 350 eng, 2 dr hdt, bckts, a/t, good. \$400. Rhodus, 281-3988.

76 JEEP - CJ7, a/t, quadra-trac, lo range, many extras. 289-3460 eves.

73 CHEVY NOVA SS - 350 ci, 4 bbl, 4 spd, AM/FM tape deck, 70,000 orig mi, very good inside & out. Best offer. Ext. 4289, 283-0165.

67 MUSTANG - not running, best offer. 281-0268 after 6.

69 OLDS 5 LUG RIMS - \$15/both. Kathi, Ext. 2913.

75 DATSUN B210 - 4 spd, 4 dr, excel cond. Asking \$2300. Ext. 3766, 286-0123.

71 PLYMOUTH FURY III - 2 dr hdt, V8, a/t, 360 w/racing head & 4 bbl carb, accident damage. \$400 or best offer. Susan, 698-4966 after 6.

4 MUSTANG WHEEL COVERS - \$5. 744-8680.

76 BUICK LE SABRE - 30,000 mi, ps/pb, a/c, landau roof, mint cond. \$3400. Brehm, 744-8567 after 6.

71 PEUGEOT 304 - S/W, front w/d, excel gas mileage. Asking \$400. Ext. 2914, 286-3742.

78 TRIUMPH SPITFIRE - brown, 11,500 mi, AM/FM cassette, Jensen co-ax speakers, still under warranty, leaving area, must sell. \$4800. Walter, Ext. 2907, 744-3339 after 6.

70 BMW A - a/t, very good all around cond. 68,000 mi. \$1000. C. Lasky, 665-7776.

70 DODGE SWINGER - 6 cyl, a/t, 60,000 mi, excel cond. \$1200. Ext. 3699.

68 FORD RANCH WAGON - 6 cyl, good, clean, \$495; 7 1/2' cutting edge for snow plow, w/nuts & bolts, \$40. 727-1617.

76 RED VOLARE CUSTOM - a/c, ps/pdb, overdrive, elec rear window defroster, AM/FM stereo cassette radio. \$2700. Ext. 3504, 878-1013.

71 FURY III - good cond, new brakes, water pump, alternator, batt, 7 tires on rims, incl snows, recent inspection. \$600. Steve, 473-4982.

74 COMET - 2 dr, 6 cyl, ps, a/t, new tires, low mileage, excel cond, economical. \$2000. 283-6338 after 4.

67 OLDS VISTA CRUISER - 9 psgr, ps/pb, a/t, white. \$380. Ext. 2518, 744-8894.

TIRES - (1) HR78-14 steel radial, \$10; (1) GR78-14 snow, \$15; (1) in-dash AM radio, \$15. Chris, Ext.3919, 929-4310.

70 FORD LTD STATION WAGON - ps/pb, a/c, 351 ci, roof rack, adj air shocks. Ext. 3066.

70 BUICK SKYLARK - good trans, needs some body work, best offer. Ext. 4452, 543-0079.

67 CHEVY BELAIR STATION WAGON - std shift, clean, orig owner. 475-6293.

70 PONTIAC TEMPEST - a/c, ps, low miles, new tires, exhaust, batt, front left fender smashed. \$150. Ext. 2386 or 924-3072 after 6.

64 BUICK SKYLARK - V6, std trans, tan, new muff, rebuilt carb, runs. \$150. Mack, Ext. 2959, 744-5977.

69 DODGE WAGON - V8, good eng, rebuilt trans, new brakes & other. George, Ext. 3010/2674.

78 TOYOTA COROLLA - 5 spd, radials, radio. \$3200. Ext. 2337.

71 SKYLARK - excel cond in & out, a/t, r/h, good tires, brakes & exhaust, recent tune-up. Asking \$1250. Terry, 281-0360.

TIRES - (4) General P155/80D13, w/w, used 9000 mi. \$40. 929-8637 after 4:30 pm.

72 CADILLAC - AM/FM stereo tape, 67,000 orig mi, new tires. \$2200. W. Powell, 732-1913.

### Boats & Marine Supplies

14' BLUEJAY SAILBOAT #1073 - trailer, 2 sets sails, spinnaker & pole, extras. \$500. P. Moskowitz, Ext. 2017 or 744-7708.

15' WOODSON TRI-HULL - fiberglass w/40 hp outboard, good cond. 732-9324.

### Miscellaneous

CHANDELIER - 5 lights (candelabra size base), brass frame, clear glass chimneys, Williamsburg styling. \$40. 589-3269.

ARCHERY SET - child's, \$75; Gillette Super Curl styler 3-1, new, \$10. Sue, Ext. 4207.

BICYCLE FRAME - Raleigh 10 spd, chain incl. \$10. John, Ext. 4540.

SOLID STATE TUNER - Dynaco FM-5, \$100; Dynakit PAS-2 preamp, stereo 70 amp, both/\$50. E. Willen, 744-6423.

STOVE PIPE - Thor, 2-30" sections, top cap, ceiling support, roof flashing. \$100. Ray, Ext. 4479.

COMPUTER - TRS-80 Radio Shack 16k level II CPU, 32k interface. 288-6242.

SKI BOOTS - Montini size 7 1/2, practically new. \$25. Joan, Ext. 2340.

FURNITURE - 3 pc Spanish liv rm set, couch, love seat & chair, fair cond. \$150. 281-5296.

ARTISTS' STRETCHING FRAMES - sizes 30x40 to 20x16, (11) Grumbacher, \$2.50-3.00; (11) homemade, \$75-1.50. Connie, Ext. 2263.

65 CUB CADET - 10 hp, plow, mower, lights, runs well. \$600. 298-5238.

KILN - Skutt, stainless, model 231-18, auto-shutoff, addl rings can be added, extras, new. \$600. Antoinette, 821-0832.

SURPLUS ELECTRONIC EQUIP - too many items to list. Jack, Ext. 4255, 289-6708.

DIN RM SET - Fr Prov, 2 curios, hutch, server, table w/6 chairs, excel cond. 758-9114.

CONTEMPORARY COUCH - new, velour, rust color mosaic print, was \$550, yours for \$390; hassock, blk, like new, \$12. Karen, 281-8016.

ROUND RUG - 8'x8', gray & blk, \$35; cocktail table, 54x22 & end table, 32x18, walnut, both \$35. Ext. 3084.

STEREO TAPE RECORDER - Concord model 727, reel-to-reel. \$150. Jim, Ext. 4476.

1 DYNACO PAT-4 STEREO PREAMP - 2 Dynaco stereo 70 amps, 1 Garrard Synchr Lab 75 turntable w/Pickering cartridge. \$150. Don, Ext. 4650.

SNAPPER LAWN MOWER - needs repair, make offer; 4 slice Black Angus toaster, almost new, \$15. Ann, 286-2280.

3 ROUND TABLES - Fr Prov, excel cond, 2 end, 1 table lamp, brass pedestals, white marble tops. Pat, Ext. 7931.

BSR STEREO - auto changer, 2 spkrs, excel cond. \$25. Ext. 2386 or 924-3072 after 6.

GE SHAMPOO-POLISHER - like new, all brushes, etc. \$22. Ext. 4058, 286-0436.

AB DICK OFFSET PRESS - model 360-11x17, shoot delivery, excel cond, reasonably priced. R. Smith, 727-4079, 727-9759.

19" B/W TV - good cond, \$40; stand, \$10. Joe, Ext. 4477, 475-1303.

FIREPLACE SCREEN - blk, draw-type, 52" w x 31" h, good cond, \$10; plant stand, 5 trays, new, \$12. Pat, Ext. 4517.

GE SEARCHER - 4 channel crystal-less scanner, AM/FM portable AC-DC. \$50. Ken, 281-6070.

BED - white formica, twin size Basset, 4 yrs old, w/box spring & matt, \$50; buffet, Danish mod, 5' long, 36" wide, walnut, good cond, \$175. Ext. 4532, 472-1934 after 5.

METROPOLITAN OPERA TICKETS - 2 good Dress Circle tickets on Fri, March 2 for "Ariadne auf Naxos." \$36/two. S. Ozaki, Ext. 3915.

COLOR TV - 2 boy's bikes, 1 sled. Ext. 3096.

EXERCISE BIKE - w/mileage guage, excel cond, \$35; 1921 Weber concert grand piano, \$2000 or best offer. 289-3415.

MAGNAVOX COLOR TV - FM/AM stereo, TV needs work, Colonial-Mediterranean. \$125. Spellman, 744-1944.

REO MOWER - \$25; bathrm sink & cabinet, \$15; travel sprinkler, \$10; baby scale, \$10; ice chest, \$7; toilet bowl & tank, \$15; bath scale, \$5; contour chair, needs uphols, \$10. Palais, Ext. 2913, 698-0576 after 6.

LENS - for Olympus 85-210mm Sun Zoom, \$50; enlarger, needs base, \$30. Charlie, Ext. 7641.

8 TRACK TAPE CASE - 4 1/2"x2 1/2" w/plexiglass doors, holds 250 tapes. \$35. 727-5956.

PEANUT VENDING MACHINE - 10¢ & 25¢ dispensers w/heating element & stand. \$95. 727-5956.

SOFA BED - Simmons 76", blue & white; lamps; drapes for liv rm, den, call for size, description. Mary, Ext. 4622, 928-5185.

SKI GLOVES - lg size, new. \$5. Bob, Ext. 4682.

19" COLOR CONSOLE TV - needs work, \$25; 17" b/w TV, works, \$20. 289-3415.

PACE SIDETALK 1000B - plus Turner, plus 3 power mike super scanner antenna, 3 element beam. \$300 firm. Ext. 3082.

TIE CLIP - gold 18kt, opportunity. George, Ext. 2674/3010.

TURNTABLE - Pioneer PL-12 w/base & dust cover. \$35. Ext. 3698, 325-0363.

ICE SKATES - excel cond, girl's white size 13, \$8; boy's blk figure, sizes 6-6 1/2, \$8; boy's hockey size 2, \$8, asstd \$3/pr, girl's 2-2 1/2, boy's dbl runner size 13. 929-4522.

BEDS - (2) fold-aways, \$10 ea or 2/\$17; (1) full size w/metal frame & box spring, good shape, \$20. 281-0360.

ICE SKATES - various sm sizes, boy's & girl's. \$5/pr. Ron, Ext. 2467, 924-8644.

8-TRACK RECORDING DECK - Pioneer Centrex RH-65, Dolby, fast forward, \$120, like new; 8-track car stereo, Pioneer Tp-727, under dash, fast forward, repeat buttons, \$60, like new. Walter, Ext. 4731.

POST CARDS - old picture & occasion, w/stamps, best offer. Chuck, Ext. 3254.

COLONIAL SOFA - print, nutmeg, only 3 mos old. \$400. 666-5367.

SOFA - 3 pc sectional, gold, excel cond. \$75. Fred, Ext. 4096 or 234-8229 after 6 pm.

### 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 Sale

BROOKHAVEN HAMLET - 3 bedrm ranch, att gar, fin bsmt w/bar & 2 fp, screened porch, new appl, beautifully landscaped near Bay. 212-472-6713 or 212-831-6157 after 6.

CORAM - beautiful 6 rm Tudor cape in Tanglewood Hills area, 2-car gar, expandable attic, w/w, fenced, appl. \$36,900. Ext. 2249, 732-6421.

SHIRLEY - 3 bedrm ranch, den w/tp, eik, D/R, w/w, fin bsmt w/bath & pvt ent, 4 appl, att gar, moving - must sell or rent w/option to buy, will hold mort. \$31,000. 281-8016.

ROCKY POINT - 2 bedrms, 2-floor house on 1/2 acre, 1 mi from beach, low taxes, garage. \$34,000, principals only. Ext. 2865, 744-4781 after 6.

E. PATCHOGUE - must sell, 3 1/2 yr custom built oversized 9 rm wide ranch, prime area, 4/5 bedrms, 2 1/2 baths, huge eik, D/R, 2 dens, 2 garages, appl, carpeting, beautifully landscaped. 289-0443.

NORTH FORK - LI Sound, secluded, 3 bedrms, 3 baths, 2 fp, rustic ranch in heavily wooded area, lg pine kit, L/R, D/R & fam rm, beautifully landscaped w/16x32 pool. 727-7741 after 6.

AQUEBOGUE - 3 bedrms, 1 bath, L/R, full bsmt, 1-car gar, landscaped, auto irr sys, 7 1/2% assumable mort. \$49,000. 722-3692.

CENTER MORICHES - 2 bedrm house, 2 fp, gar, fenced-in yard, take over existing VA mort. \$33,000. 878-0686.

SHIRLEY - waterfront prop, bulkheaded, 51'x214', low taxes, 5 rms, 2 bedrms, eik, bath, L/R, Florida rm, full heated bsmt, city water, oil heat, w/furn & appl. \$49,990. Ext. 4253, 928-4926.

MASTIC BEACH - sale/rent, \$35,000 or rent \$375/mo, 3 bedrm ranch, 2 baths, L/R, D/R, eik, full bsmt, playrm, carpeted, patio. 281-3133.

SHOREHAM - 4 bedrm colonial, white cedar shakes, 2000 sq ft liv space w/2-car gar, fin bsmt, w/w, s/s. \$56,000. 744-2821.

CALVERTON - 3 bedrm ranch, oil fired heat & water, s/s, fin bsmt w/bath & kit, 1 acre prop. \$34,000. 727-9058.

ROCKY PT - The Tides, 70' ranch on 1/2 acre, 3 bedrms, 2 full baths, L/R, D/R, den w/tp, eik, oak floors, full bsmt, gar, patio, ex schools, shopping, pr beach. Otto, Ext. 4605, 744-6482.

CALVERTON - sale/rent, 100'x196' wooded, 5 rm ranch, compl furn Span style, full D/R, full bsmt, h/w baseboard oil heat, 12x20 deck to 16x32 in-ground pool, circular driveway, carpet, pro landscaped, 5 appl, settle estate. Hank, Ext. 3280, 727-7515.

PATCHOGUE - near shopping, 4 bedrm cape, in-ground pool, handsplit cedar shingles, 16x24 peck cypress L/R w/tp, 2-car gar, all appl, immaculate, immed occupancy. Asking \$52,000. AT6-1285.

For Rent

YAPHANK - 2 bedrm house on 1/4 acre, lg kit/din area, 5 mi to Lab, unfurn. \$265/mo plus util. Inquire for sale. 924-4719.

VT CHALET - beautifully furn, X-C skiing trails, near Bromley, Magic & Stratton Mtns. 757-5599 after 4.

SOUND BEACH - 2-3 bedrm house, 1 1/2 baths, all util incl. \$400/mo. Mary, Ext. 2926 or 281-0268 after 5:30.

POCONO'S - winter vacation, secluded chalet, sleeps 6, ski Tanglewood, reasonable, avail wks/wkends. 289-2159.

MASTIC - 6 rm house, bsmt, 3 bedrms, unfurn, avail immediately, insulated. \$350 + util, security. Ext. 3937, 286-8195.

MILLER PLACE - 4 bedrm furn house, Feb-Aug. Ext. 4521.

MASTIC PARK - cottage, 2 bedrms, immaculate. \$200 + util, security. 281-7844.

MILLER PLACE - 3 rm apt, priv ent, semi-furn, avail immediately. \$250/mo incl util. 732-9324.

### Wanted

ANYONE WANTING USED SPORTS TROPHIES - free, preferably for charitable causes. 286-0376.

COLOR TV - ugly, working & cheap. Chris, Ext. 4612, 281-7379.

BABYSITTER - for 2 school children, own transp a must, Blue Point area. Ed, Ext. 4122, 363-2130.

LIONEL & AM FLYER TRAINS - top money pd. Jerry, 281-5667 after 3.

EMPTY PLASTIC EGGS - From Leggs panty hose. E. Pluta, Ext. 2957.

SKI BOOTS - ladies' size 7. Roy, Ext. 4600.

BABYSITTER/LIGHT HOUSEKEEPING - at my house for an 18 mo & 8 yr, knowledge of Spanish desirable. 751-2095 eves.

MOTORS MANUAL - 71, 72 or 73 Buick. Walter, Ext. 2957.

HOMES - for 2 spayed female cats, 2 yrs old, white w/patches, & all white altered male. Joann, 744-2821.

1 OR 2 BEDRM APT - furn or unfurn, near BNL. 345-2521.

HOUSEMATE - for inexpensive & convenient apt in N. Shirley. Ext. 2614.

WINDMILL SAILBOAT - or similar, very good cond, compl unit, to be shipped abroad. George, Ext. 3010/2674.

BABYSITTING AT MY HOME - 727-5912.

ELEC TABLE SAW - Ext. 3083.

### Car Pools

SHOREHAM - would like to form 2-man car pool in vicinity of N. Country Rd & Miller Ave. Pete, Ext. 3297, 821-9547.

SELDEN - would like to join or form a car pool from near Boyle & Hawkins Path. Chuck, Ext. 4305, 698-0710.

### Services

HARDWOOD FIREWOOD LOGS - full cord \$90 delivered within 5 mi of Shirley, outside area sm addl charge. Lou, 281-7273.

EXPERT TUTORING - certified teacher, reading, math to grade 12, French, German, English, in my home. \$10/hr. 941-4328.

FIREWOOD - seasoned oak, 4'x8'x18", \$50 delivered; 4'x16'x18", \$90. 924-4284 after 5:30.

CHILD CARE - in my home, all ages. Ext. 3076.

ALUM SIDING & ROOFING - fully licensed & bonded, reasonable & dependable. Al & Steve, 585-4329.

TUTORING - experienced certified special educator, programs designed to meet specific needs, all subjects. M. Friedman, 689-9463.

TAXES - prepared by tax consultant, your home or mine, reasonable. John, 732-2472.

FIREWOOD - seasoned cord, delivered. \$90. 281-8016.

### Classified Ad Policy

Deadline is 12 noon Monday for publication Friday of the same week.

- The Brookhaven Bulletin's classified section may be used only by active and retired laboratory employees.
- All items for sale or rent must be the advertiser's property.
- Ads for material acquired for resale in association with a full or part-time business cannot be accepted.
- Firearms offered for sale or trade may not be brought on site.

- Ads not carried because of space restrictions will be held for publication in the next issue.
- Ads are run only once and must be resubmitted if they are to be repeated.
- 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, 40 Brookhaven Avenue.

- For Sale: Autos & Auto Supplies     For Sale: Miscellaneous     Lost & Found Services     Wanted
- For Sale: Boots & Marine Supplies     Car Pools

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) .....