BROOKHAVEN BULLETIN
Vol. 37 - No. 5 February 4, 1983
BROOKHAVEN NATIONAL LABORATORY

$10,000 Saved Is $1,000 Earned

If you have a first-rate idea that could improve an aspect of Laboratory operations, and that idea is judged to be valid, you could earn yourself an award of up to $10,000.

A new program which will provide employees with a formal mechanism for submitting productivity improvement ideas, will go into effect on February 14. It is called the Employee Suggestion System.

All regular employees are eligible to submit suggestions which are of either tangible or intangible benefit to the Lab.

Tangible ideas are those which are readily recognizable as having a direct cost savings to BNL. For instance, contractors picked up scrap paper and cards at various on-site locations which had storage space for only a limited amount of material. An employee suggestion that the collection be done internally and materials stored in a large central location for contractor pickup, resulted in an increase of saleable scrap and a first year saving to the Lab of $1,000. Cash awards for tangible ideas, such as this one, will be equal to 10% of the first year's estimated net savings to a maximum of $10,000.

Intangible ideas can best be described as those with benefits that cannot be directly translated into dollars and cents. For instance, an employee suggests that exterior lighting be installed in an area surrounding a poorly lit guard house in order to improve the patrol officer's view of his or her observable area. This idea's benefit cannot be measured in precise dollar savings. However, it does result in an improvement of security procedures and, therefore, would be eligible as an intangible.

The cash award in this case would be determined on the degree of benefit, extent of application, creativity and effectiveness of solution.

Ideas concerning improvements for benefit plans, salary or wages, routine maintenance and repairs, and bargaining matters, are not eligible for consideration.

The scope and responsibility of an employee's job will be primary factors in determining whether a suggestion qualifies for an award. Employees will not receive cash awards for suggestions which are deemed to be part of their regular jobs, and for which they are already getting paid. For example, a technician who comes up with an idea to upgrade a method of testing, would be eligible for an award. But an engineer who came up with the same idea, would, in all likelihood, not be eligible since it would be considered within the scope of that job.

All awards are paid after the ideas are implemented and all cash awards are taxable.

Employee incentive systems began to develop around the turn of the century. Since that time many major companies and government agencies have installed formal systems. At Brookhaven the idea arose out of the 1981 Cost Cutting Committee's objectives and a followup study by the Scientific Program Administrators' Group (SPAG). Responsibility for developing and implementing the program was given to Personnel. Personnel Manager Robert D'Angio designated Cory Ince to head up the Suggestion Office and, for four months, she has been working with Associate Director Vincent O'Leary and the SPAG committee to develop a system. Ince sees the program as significant both for cutting costs at the Lab and for employee relations.

Mort Rosen

Members of the Suggestion Committee check copy on the handbook for the Employee Suggestion System which will be released next week. Seated from left are Len Chimienti (Accelerator), Cory Ince (Personnel, and head of the Suggestion Office), Arnold Peskin (Applied Math). Standing from left are Bruce Medaris (Plant Engineering), Bob Casey (S&EP), Don Robbins (Budget) and Glenn Price (Office of Scientific Personnel).

She will be assisted by a committee composed of Don Robbins (Budget), Bruce Medaris (Plant Engineering), Len Chimienti (Accelerator), Bob Casey (S&EP), Arnold Peskin (Applied Math), and Glenn Price (OSP).

As to procedure, it is recommended that the employee submit his or her idea in writing, on a form available from a department or division's central administration office, or from the receptionist in Personnel. Suggesters are asked to give completed forms to their immediate supervisors, who, in turn, will forward them to the Suggestion Office in Personnel. Here a suggestion is recorded and checked for eligibility. The Suggestion Office sends it on to the suggestion coordinator of the department or division that would be responsible for implementation if the idea were adopted. The coordinator determines who the appropriate evaluators would be and refers the suggestion to them. If the green light is given, the suggestion is then reviewed by the Suggestion Committee who will rule on elibility and amount of the award.

An employee who submits an idea which is declared ineligible, or is not implemented, will receive a letter from the Suggestion Office explaining why.

Further details of the new system will be included in a handbook which will be distributed to all employees next week.

W Comes Before Z

On January 26, Professor Carlo Rubbia of Harvard described a major new discovery to a meeting of the American Physical Society in New York. The following day he repeated his findings at a special seminar at BNL — a report on the long-awaited observation of the W^+ and W^- particles, the electrically charged intermediate vector bosons which carry the weak force.

This force is responsible for fundamental processes like nuclear beta decay and neutrino interactions. It is one manifestation of the electroweak interaction, one of three basic forces in the universe. The other two are gravity and the so-called strong force, which binds atomic nuclei together.

The existence of the W particle was predicted years ago, and numerous unsuccessful searches for it were carried out. With the recent theoretical unification of the electromagnetic and weak interactions, confidence in the existence of the W (and its sister particle, the uncharged Z^0) grew, and calculations of its mass became more precise. The W mass was predicted to be 82±2.4 GeV, about eight times heavier than the heaviest previously known particle, the upsilon.

To reach this high mass, a new proton-antiproton collider was created at CERN, using the existing SPS accelerator. With 270 GeV protons colliding against 270 GeV antiprotons, the total available energy was 540 GeV. A

(Continued on page 2)

Mort Rosen

Carlo Rubbia, led a team of 135 scientists from 12 institutions to the discovery of the W boson. Here, he describes the discovery at a BNL Seminar.

PUMA Ready For Action

There's a PUMA in the Applied Math Department (AMD). But although it's quick and strong and sleek, like its feline namesake, there's really no cause for concern. This PUMA is a computer.

The PUMA in AMD is a Processing Unit with Microprogrammed Arithmetic and is the result of a collaborative effort between BNL and New York University.

Niels Schumburg, PUMA project manager for AMD, explained that PUMA got its start in 1974, as a research project at NYU. Professor Ralph Grishman and his graduate students built a prototype they called PUMA I, which emulates only the central processing unit (CPU) of a CDC 6600. To emulate every 6600 component would have been prohibitively expensive. So, about four years ago, they approached BNL.

NYU had seen the project as a means of replacing the CDC 6600 computer, which is already about 15 years old and which consumes about 200 square feet of space, with a much smaller, but equally capable unit, featuring the newest technologies. Schumburg said of his group's efforts, "What we did in the last four years was develop the hardware that interfaces to the outside world and central memory. We took NYU's finished design and merged it with ours." At BNL, those who worked with Schumburg to contribute to the design of the system were Ludwig Burgar, Don Litcher, Brian Oerter and Ralph Trondle. Their NYU collaborators were Ron Bianchini and Rich Kenner.

The final PUMA II configuration consists of ten stand-alone computers (each dedicated to input/output), 12 input/output channels, a CPU and an interface to central memory. All of the hardware and software in PUMA II takes up less than 12 square feet. "It's a lot smaller than the CDC," said Schumburg. "Where the CDC used discrete components, we are using large scale integrated (LSI) circuits, which means we can put more logic in less space than they could 15 years ago."

With 131,000 words of memory, PUMA II is, in many ways, equivalent to the CDC 6600. But, Schumburg said, "It has new enhancements that the 6600 doesn't have. If there were a need, we could quadruple its memory very inexpensively."

All of the hardware in the PUMA II system is controlled by microcode that resides in the computer. "In this case," explained Schumburg, "we are microprogramming to emulate the 6600. Theoretically, we could emulate any 60-bit machine, just by changing the microcode. This gives us a lot of flexibility since we can change the design of the system by changing the microcode, as opposed to changing hardware."

These are a few of the features of PUMA II that recently brought it to the attention of a commercial company, which, said Schumburg, "is seriously interested in manufacturing PUMA II because it is a 64-bit computer that looks like a mini." While minicomputers are very hot items in

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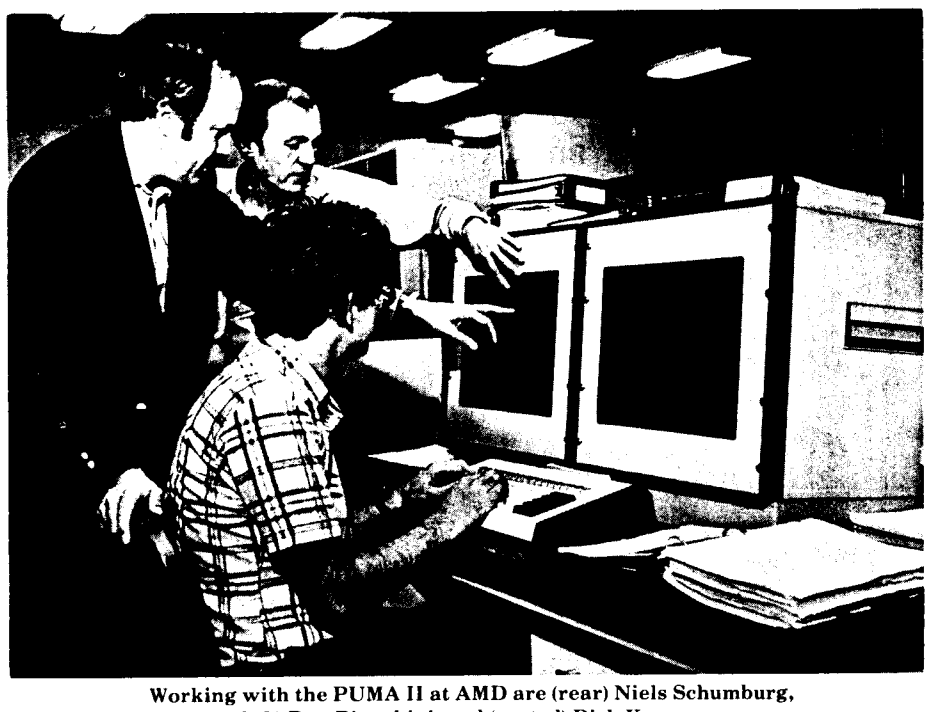


Alex Reben

Working with the PUMA II at AMD are (rear) Niels Schumburg, (left) Ron Bianchini, and (seated) Rich Kenner.

PUMA (Cont'd)

today's market, Schumburg said that "the state-of-the art is a 32-bit mini. PUMA II is a leapfrog ahead of what industry can produce right now."

In addition to its computing capabilities, PUMA II is portable and air-cooled. The company in question would like to manufacture PUMAs to be used in the field by the oil industry, anywhere there's exploration, to take and analyze data on the spot. If the present negotiations are fruitful, Schumburg explained that they would be equally beneficial to BNL in that "we will have another company that can support our PUMA in the future, with things like maintenance and spare printed circuit boards."

For now, however, there is only one PUMA II and, since the end of 1982, it has been tried at AMD on CPU-bound jobs for which execution time is not a critical factor. These jobs produce the same results as on the 6600.

The BNL/NYU collaboration is eager for user feedback about PUMA II. Anyone interested in running their next 6600 job on this computer should contact Niels Schumburg, Ext. 4124.

—Anita Cohen

A Journalist's View

Gil Noble, television host and producer of "Like It Is," a weekly, black public affairs series, is a respected broadcasting journalist. Noble will draw on his experience when he presents his views about blacks in the field of journalism, in a lecture at Berkner Hall on Wednesday, February 9, 8 p.m. There is no admission charge for the lecture which is being presented by the Afro-American Culture Club as part of a month-long celebration of Black History Month.

Born and brought up in Harlem, Noble took night classes at City College of New York while working days at the New York Public Library. He began his broadcast career in 1962, at WLIB Radio, New York. In 1967, he came to WABC-TV as a correspondent and co-host of "Like It Is."

The documentaries on "Like It Is" are often biographical. Malcolm X was the subject of "El-Hajj Malik El-Shabazz," which won Emmy awards for both Noble and "Like It Is." For his production of "Adam Clayton Powell, Jr.: An Autobiographical Documentary," Noble won another Emmy. The New York Academy of Television Arts and Sciences recognized Noble's work in 1978 by awarding him the Special Governor's Citation of Merit for "his series of visual biographies of black leaders." And his tribute to Malcolm X earned him the 1975 El-Hajj Malik El-Shabazz Award for Service and Dedication. In all, Noble has amassed more than 60 community awards as producer and host of "Like It Is."

Before Gil Noble's lecture, the audience is invited to visit Room C, to view a photography exhibit by Walker Turner, Jr., which will be open that evening from 7:30—9 p.m. as well as weekdays, from noon to 1:30 p.m., through February 11.

A Gospel Extravaganza — a spectacular roundup of five gospel groups will take place on the stage at Berkner Hall, tomorrow at 7 p.m. Tickets, at $5 each, can still be purchased from April Donegain, Ext. 2903; Mary Durham, Ext. 3427; Sandra Green, Ext. 4933; Michele Henderson, Ext. 4303, Frances Ligon, Ext.3316; or Mac Thomas, Ext. 2959.

Gil Noble

AMD — At Your Service

One important function of the Applied Math Department is to support Lab scientists in the computational aspects of their research. The backbone of this support is the computers and computing services available at the Central Scientific Computing Facility. In addition, other services, which are available Lab-wide, are summarized in the chart below:

Type of Service	Description	Initial Contact
Software	Will provide programming assistance to departments.	Harold Berry Ext. 4252
Hardware	• Digital Engineering — Will provide services of engineers and technicians for such projects as interface development and installation of equipment.	Ted Daniels Ext. 4163
	• Maintenance — Will repair and maintain certain makes and models of equipment.	Mike Losquadro Ext. 7594
Education	Regularly offers courses on topics of interest in the computing field. Open to general Lab population.	Ron Wittlock Ext. 4112
Consulting	On an informal basis, will advise on mathematics, statistics, programming, and equipment procurement and usage.	Ronald Peierls Ext. 4104, or Arnold Peskin Ext. 4161, for referral

Inside Info

Biochemist **Marshall Elzinga** heads the Biology Department's research into muscle protein structure and function. In a BNL Lecture last June (see Bulletin, 5/28/82), Elzinga explained that the two crucial proteins associated with muscle contraction are actin and myosin, which are contained in most cells. Recently, Elzinga's own research has focused primarily on myosin, but he called on his previous experience with actin to assist 17-year old **Alexandra Kroeger** in the design of the science project which, last week, made her one of the 40 national winners in the annual Westinghouse Science Talent Search. Kroeger's project should yield information about how actin molecules are organized within the cell. Kroeger, a student at Shoreham-Wading River H.S., worked at BNL for a few months as a student intern and is the daughter of Peter Kroeger, DNE.

WIS Meeting

The next meeting of Women in Science is scheduled for Tuesday, February 15 at noon, Room A, Berkner Hall. Barbara Hoffman-Gabel will speak on "Many Old People Need Help," a personal report about nursing homes and service centers for old people in West Germany. Hoffman-Gabel studied psychology and education at the Universities of Berlin and Munich, and worked in the field of adult education in Munich, Hanover and Bremen. She is accompanying her husband during his sabbatical in BNL's Medical Department.

Everyone is invited to this meeting. Please bring your own lunch.

Lecture Reminder

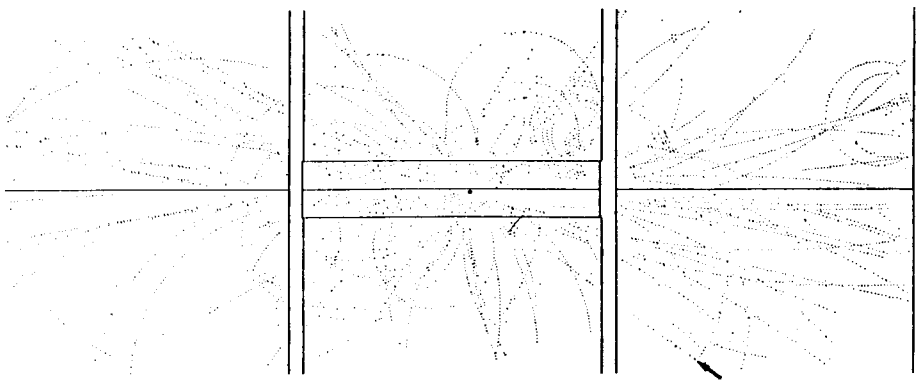
Dr. Joseph Allen, NASA Mission Specialist, will speak at Berkner Hall on February 7, at 3:30 p.m. His subject will be "NASA Space Shuttle for Fun and Profit?"

W Boson (Cont'd)

billion such collisions were used to produce a final sample of five events which appear to be examples of $W^{\pm}$ decaying to an electron (or positron) and a neutrino. The same five events were found in two ways — by searching for isolated electrons emitted from the collision point with high energy transverse to the beams, and by searching for high missing transverse energy.

The latter approach took advantage of the huge and heavily instrumented UA1 detector, which tracks and identifies all charged particles coming from the collision point except those which go within 0.2 degrees of the beams. By measuring the transverse energies of these observed particles (often 50 or more), the experimenters could deduce the transverse energy of any missing particle. In practice, only a neutrino could escape detection; hence this procedure amounted to a search for neutrinos. In each of the five events, the electron and the missing neutrino came out on opposite sides of the beam line and with approximately equal energy, as would be expected from a two-body decay of a slowly moving W. Correcting for this motion, Rubbia estimates the W mass to be 81±5 GeV, close to the expected value.

Another CERN collider experiment, UA2, has also seen indications of W's. As yet, neither group has observed the Z^0, but that search is certainly high on the list of priorities. In fact, it was expected that Z^0, which decays to e^+e^-, would be easier to find than the W with its missing neutrino. The clean signatures of the events seen by Rubbia *et al* are especially encouraging to many who had expected a more difficult and uncertain process of identifying W's.



One of the W→eν events found at CERN. The high energy electron track is indicated with an arrow. (The neutrino, of course, does not leave a track.) The other 64 particles produced in the $\bar{p}p$ collision are unrelated to the W.

The importance of this discovery is considerable, not only to physics in general, but in particular to Brookhaven which has been very active in this field. BNL theorists have made some of the key calculations of the expected mass and production cross sections of W's, and the planned Colliding Beam Accelerator (CBA) is expected to be a W "factory," producing many thousands of W→eν events every day. The exceptionally high data rates offered by the CBA will allow stringent tests of the standard model of quarks, leptons and intermediate bosons like the W, and exploration into possible new kinds of particles with masses up to 300 GeV. These include new quarks such as the long sought "top" quark, possible heavier types of W's and Z's, and new particles predicted by non-standard theories like technicolor and supersymmetry. Perhaps most important are the unexpected discoveries that so often appear when a new energy realm is entered.

— Neil Baggett

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Change In Plans

Two changes have been announced in plans for the 9th BERA Members' Art Exhibit which will run from February 14—25 in Berkner Hall. First, those people submitting works for the display should deliver them to Room B, Berkner Hall, on February 11 (not February 14 as previously stated), between 8:30 a.m. and 12:30 p.m. Second, the exhibit viewing hours have been extended and are now 11:30 a.m.—1:30 p.m.

Arrivals & Departures

Arrivals

Brenda H. Laster ..... Medical
Michael W. Matthew ..... Chemistry
Anthony Schiavone ..... Central Shops
Chieu D. Tran ..... Energy & Env.

Departures

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

Carl J. Costantino .... Nuclear Energy
Raymond Laneville ..... Central Shops
Luis Lederman ..... Nuclear Energy
Stuart Z. Levine ..... Nuclear Energy
Charles A. Miller ..... Nuclear Energy
Pandit G. Patil ..... Energy & Env.
Kurt Rabe ..... Plant Eng.

Cooking Exchange

"Breads and Spreads" will be the theme of the next meeting of the Cooking Exchange on Wednesday, February 9, at 12:30 p.m. in the Recreation Building.

A variety of breads will be featured, from sour rye to a beer batter bread. Accompaniments, to be demonstrated and sampled, will include eggplant caviar and a peanut butter and tofu spread.

Meetings of the Cooking Exchange are held on the second and fourth Wednesdays of each month and are open to employees and their immediate families. There is a charge of $1 per person at each meeting and babysitting is provided at 50¢ per child.

For more information, call Mary Daum (744-1898), or Adrienne Usher (289-7658).

Tax Tip

One of the changes in New York State income tax returns for 1982 is a Gift for Wildlife. Under this provision, a taxpayer can make a contribution to help the Department of Environmental Conservation conserve and protect the state's wildlife. Gifts must be made in whole dollar amounts and will either be deducted from a taxpayer's 1982 refund or added to his or her tax payment. However, this gift is deductible as a charitable contribution on the 1983 tax return. To give a Gift for Wildlife, just follow instructions for line 18 on New York State long form IT-201 and for line 12 on short form IT—200.

Censor: a man who knows more than he thinks you ought to know.

Commuter: a traveling man who pays short visits to his home and office.

Cost of living: the difference between your net income and your gross habits.

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to New York City on Wednesday, February 16. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare for adults is $3.50; children under five years ride free.

Reserve a ticket by sending your fare through the U.S. mail to Hospitality Committee, P.O. Box 322, Upton, New York 11973. Please do not send cash. Checks or money orders, payable to BNL, must be received by Thursday, February 10. Put the date of the trip, your BNL life number and your phone number on the back of your check or money order. Your tickets will be given to you at the station on the day of the trip. Refunds will be made only if cancellations are received by the Monday morning preceding the trip.

Cafeteria Menu

Week Ending February 11, 1983

Monday, February 7		
Spinach egg drop soup	(cup)	.65
	(bowl)	.75
Chicken livers & 1 veg.		1.75
Beef stroganoff on egg noodles		1.95
Hot Deli — Roast turkey breast	(bread)	1.85
	(roll)	1.95
Tuesday, February 8		
Lentil soup	(cup)	.65
	(bowl)	.75
Veal scallopini & 1 veg.		1.90
Swedish meatballs on egg noodles		1.85
Hot Deli — Sandwich steak w/peppers & onions	(bread)	1.95
	(roll)	2.05
Wednesday, February 9		
French onion soup w/croutons	(cup)	.65
	(bowl)	.75
Salisbury steak & 1 veg.		1.85
Southern fried chicken & 1 veg.		1.90
Hot Deli — Sausage & pepper hero		1.95
Thursday, February 10		
Turkey noodle soup	(cup)	.65
	(bowl)	.75
Sweet and sour pork on white rice		1.95
Pot roast of beef & 1 veg.		2.00
Hot Deli — Monte Cristo		1.90
Friday, February 11		
Manhattan clam chowder	(cup)	.65
	(bowl)	.75
Shrimp fries & cole slaw		2.10
Beef hash & 1 veg.		1.85
Hot Deli — Clam boat		1.95

Diners Note

The cafeteria will be closed on Saturday, February 5. On that day, snack bar service will be available from 9 a.m. to 2 p.m. at the Brookhaven Center.

Bowling

White League

J. Griffin had games of 235/201/607 scratch, D. Adams 202, M. Scheidet 187/185, P. Manzella 182/198, N. Erickson 189, J. Ferrante 200, J. Petro 209, B. Sells 212, G. Hassell 205, K. Asselta 223. Clearwater is in first followed by the Dips and the Diamonds.

Red/Green League

High games were bowled by R. Larsen 204/213/203 for a 620 scratch series, H. Arnesen 224/606 scratch 681 gross series, K. Asselta 224, R. Sick 217, E. Sperry 211, J. Morris 209, H. Marshall 200.

Pink League

E. Kristiansen rolled games of 183/190, J. Thiede 173/190, S. Long 162, M. Larsen 162, M-G Meier 164/174, H. Keeley 180/180, R. Rosati 172/169.

Purple League

High games for two weeks were bowled by D. Hall 201, P. Stone 202, E. Meier 235, B. Jellett 201, B. Benson 200, B. Jellett 205.

Scotch Doubles

A Scotch Doubles Tournament is scheduled for Sunday, March 13 at 2 p.m. at the Port Jeff Bowl. Entry forms are available at the BERA Sales Office in Berkner Hall.

The New Zurich String Quartet

A Valentine For Music Lovers

The New Zurich String Quartet will present a special concert on February 14, at 8:30 p.m. in Berkner Hall. The four members will be joined by pianist Lory Wallfisch, professor of music at Smith College, in part of the program.

The quartet was founded in 1969 and has appeared regularly throughout Europe. The ensemble has been heard at various festivals including the International Festival in Lucerne, the International June Festival in Zurich and the Menuhin Festival in Gstaad. Its repertoire encompasses works of all periods and styles.

At Brookhaven, the artists will play the Quartet in G major, Op. 76, No. 1 by Franz Joseph Haydn; the Piano Quartet in D minor, Op. 30 by George Enesco in which pianist Lory Wallfisch will join; and the Quartet in C minor Op. 51, No. 1 of Johannes Brahms.

Tickets will be available at the door. General admission is $5; $3 for BERA Concert Series block ticket holders, students, those over 65 and under 18.

Lory Wallfisch

Motorcycle Club

All who plan to join the group trip to the motorcycle show at Madison Square Garden tomorrow, should be at the Patchogue railroad station before 8 a.m. to allow for a head count and purchase of the group ticket block. Latecomers must pay full fare. If you have any questions, call Dick Hildenbrand at Ext. 3273.

The next club meeting will be on Monday, February 14 at 5:15 p.m. at the Recreation Building. Please attend.

Volleyball

Standings as of 1/31/83

A Division	
Dinkers	6-0
Mixed Ups	4-2
Teddybares	4-2
Nuts and Bolts	2-4
EPOs	1-5
Nuclear Wastrels	1-5
B Division	
Semi Tough	8-1
Phoubars	6-0
Up Fagrabs	6-3
TNT	6-3
Puff and Stuff	4-2
Nuke Yorkers	3-3
Screwballs	1-5
Chungas Revenge	1-5
Quirks	1-8
KMA	0-6
Open League	

Corrected final standings for end of the second quarter:

Phoenix	20-0
Raiders	15-5
Brewmasters	8-12
Random Errors	8-12
FRE8D	7-13
Half Lifes	2-18

Theater Group

The Theater Group will meet at 8 p.m. on Friday, February 11 in Berkner auditorium. Anyone who is interested in getting involved with BNL Theater productions is invited to attend.

'83 Vegetable List

The "1983 Recommended List of Vegetable Varieties for Home Garden Use" is now available from the Cooperative Extension Association of Suffolk County, Riverhead (727-7850). The list includes vegetables that are well-adapted to New York State conditions. Varieties listed are dependable and of relatively high quality, with a fairly long harvest period and resistance to diseases and insects. More than 20 new varieties have been added to this year's list of 37 different types of vegetables. Varieties are listed in order of maturity — from early to late.

Mountain Club

There will be a meeting of the Mountain Club at 7 p.m. next Tuesday, February 8, at the Recreation Hall in the apartment area. Slides of previous outings (canoeing, rock climbing, hiking) will be shown and refreshments will be served. Also, plans for a canoe trip, February 19 to 26, to the Everglades will be discussed. Anyone interested in joining the club should attend. For further information call Don David, Ext. 4821 or 286-2267.

Classified Advertisements

Placement Notices

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

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

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

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

The vacancies listed below have been exempted by the Director's Office from the current freeze on open requisitions.

OPEN RECRUITMENT: Opportunities for present Laboratory employees and outside applicants.

1823. EXPERIMENTAL MACHINIST - Requires experience in job print interpretation, layout, and machine set-up. Candidates must demonstrate ability and imagination in all phases of machine work. Will function as all-around machinist for non-production work in research and development shop. Project assignments range from raw materials work in research to final assembly. Central Shops Division.

1824. TECHNICAL POSITION - Requires AAS in mechanical technology or equivalent and several years experience in the fabrication, installation, operation, maintenance and testing of mechanical equipment, with special emphasis on cryogenic and vacuum techniques. Occasional shift work. Power Transmission Project. Accelerator Department.

Autos & Auto Supplies

VW PARTS - Bug muffler, compl., $28; Rabbit muffler, $36; tow bar, $37.50; Bug front shocks, $8.75/ea., Rabbit bumper, $49.50, Bug master cylinder, $37, all brand new. Augie, Ext. 2419 or 325-0594 eves.

75 PLYMOUTH FURY - 2 dr., small V8, winterized, very good cond., $1,800. Barbara, 399-0232.

82 FAIRMONT - 9,000 mi., 4 cyl., 4 spd., 4 dr., a/c, p/s, p/b, rustproof & more, mint cond., cost over $8,000, asking $6,695, negotiable. 281-8274.

68 SCOUT - 4x4, 66K orig. mi., all terrain tires, locking hubs, $950. Bill, Ext. 2050 or 281-0557.

RADIAL TIRE - 14", needs plug, off Buick Regal, $5. Ext. 3274.

80 HONDA HAWK - sport model, CB400T, excel. cond., low mi., extras, $995. 286-8814 after 5:30 p.m.

70 FORD MAVERICK - 6 cyl., very dependable, $700. Ext. 2311 or 369-2414.

73 VOLVO - 164, 4 dr. sedan, leather int., a/c, auto., am/fm, $1,650. 286-0422.

70 VW BUG - semi-auto, rebuilt eng., new brakes, $625. 543-4531.

77 CAMPER - Coachman, 16' tent, trailer, excel. cond., extras, $1,500. John, Ext. 5171.

76 FORD GRANADA - good cond., p/s, p/b, 6 cyl., auto., little rust, 62,000 mi., $1,595. 727-5532.

67 CHEVY CAPRICE - auto., good cond., $400. Gloria, Ext. 3303 or 924-6507 after 6 p.m.

68 BUICK SPECIAL WAGON - 350, V8, auto., it runs, $250. Lloyd, Ext. 3381.

74 SUPER BEETLE - good cond., some new parts, $1,000. Susan, 878-8459.

80 HONDA HAWK - crashed, needs elec. work, engine and frame intact, asking $600. Gary, 473-2473.

CAR AMPLIFIER/EQUALIZER - Pioneer AD-50, 50 watts total power, excel. cond., $90 or best offer. 744-8063 days.

79 HONDA MOTORCYCLE - CM400T, 2,000 mi., garaged, must sell, $1,000. Ext. 7125.

81 SUZUKI - RM125, excel. cond., like new, many extras, $875. Jim Jr., 929-4136 eves.

68 AMC REBEL - 6 cyl., excel. running cond., new tires and brakes, many new parts, must sell, $500. Ext. 4707.

71 VW - excel. running cond., rebuilt engine, $800. Ext. 4743.

66 CHEVY II - Super Sport, high mileage, runs well, good transportation, good rubber, brakes, $600. Ext. 3100.

71 CHRYSLER NEWPORT - body & engine good cond., auto., a/c, p/s, p/b, $450. 732-3105 eves.

80 CHEVY MONZA - V6, a/c, p/s, p/b, auto., new tires, am/fm, clean. Vinny, 281-7230.

TIRES - & rims, (4) 1200 Flot-Tracs; (4) 15x8 brushed aluminum wheels; (4) 15x10 white spokes; all 5 lug. Vinny, 281-7230.

67 PONTIAC TEMPEST - 350, V8, new brakes, $400. 727-0499 after 6 p.m.

79 SUBURU - 4 wheel drive wagon, $1,800. 281-1323.

81 HONDA MOTORCYCLE - GL1100 Goldwing, metallic drk. blue, crash bars, luggage rack, garaged, excel. cond., 3,000 mi., full face Bell helmet, $3,000. 744-6892 eves.

76 FIAT - 131S, 5 spd., 2 dr., 26 mpg., a/c, am/fm, good body, asking $1,400. Ext. 2521 or 928-8379.

69 CHEVELLE - convertible, new top & paint, good cond., asking $1,695. Ext. 3319 or 928-8010.

76 CUTLASS SUPREME - orig. owner, ps/pb/ac, fm/cassette stereo, blue w/white inter., vinyl roof, $2,100. 929-6765 after 6 p.m.

77 CHEVY SUBURBAN - K-10, 4x4 Silverato, ps/pb/ac, am/fm stereo, much more, $5,200. Paul, 727-4859.

SLOTTED CHROMES - (2) Plymouth, 14" & hubs; (1) F70-14 white lettered tire, excel., $30. 744-3141.

78 BOBCAT STATION WAGON - 4 cyl., auto., ps/pb, 25,000 orig. miles, mint cond., $2,650. 475-1469 after 5 p.m.

79 HONDA ACCORD - 4 dr., 5 spd., ps/pb/ac, sunroof, 43,000 mi., mint, $5,700. Ext. 2910 or 698-6259 after 5 p.m.

76 VW RABBIT - very good cond., well maintained, 4 spd., 30+ mpg., must sell, $2,050. Chip, Ext. 2256 or 928-5836.

71 TOYOTA COROLLA - tow away for parts, $50. Don, Ext. 2767.

81 BUICK CENTURY - 4 dr., V6, ac/at/ps/pb, very clean, mint. Tom, 589-0993 after 6 p.m.

74 GREMLIN - 6 cyl., auto., excel. mechanical cond., no rust, $1,000. Bill, Ext. 3579 or 298-5138 after 6 & weekends.

68 BUICK SPECIAL WAGON - 350, V8, auto., it runs, $250. Lloyd, Ext. 3381.

76 HONDA MOTORCYCLE - 550cc, 4 cyl., fairing, trunk, custom seat, excel. cond. except muffler. Ext. 3319 or 369-3068.

SNOW PLOW - Meyers, 6', new blade, fits Jeep or Bronco comp. Vinny, 281-7230.

74 PINTO - Runabout, excel. cond., a/c, 4 spd. trans., must be seen. Don, Ext. 5329 or 878-2215 after 6 p.m.

Boats & Marine Supplies

17' THUNDERBIRD - cathedral hull, 90 HP Mercury, Trailex aluminum trailer, asking $2,000. Borg, Ext. 3568 or 286-0428.

MUSHROOM ANCHOR - 100 lb.; 40' chain; bouy; pick-up bouy, $70; folding Ketch anchor for 30' boat, $35. Art, 588-3055.

21' T-CRAFT - 1972, 307 Chevy Corvette I/O engine, excel. cond., full canvas, trailer, Ext. 3319 or 369-3068.

HITCH - class II for Cutlass, Malibu, Century cars & wagons, $75 will install. Ext. 4121.

Miscellaneous

SKIIS - 185cc, Rossignol Strato 204, Marker/Nevada bindings, Caber boots, size 9, good shape, $100. Tony, 288-3535.

MINK COAT - size 12-14; 8x10 Oriental rug; French Victorian antique bed, full size. 472-0509.

STEREO SYSTEM - featuring a 30 watt Yamaha R-300 receiver, Yamaha speakers, Technics turntable, Mitsubishi cassette desk, entire system, $850. Brian, Ext. 2311.

STEREO/TV CABINET - Mediterranean design, 8' long, solid oak, $150. 363-2070 eves.

LOVE SEAT/COUCH - brown velour, excel. cond., $100. Ext. 7745.

RUBBER RIDING BOOTS - girl's size 4W, $5. Ext. 7009.

WALL OVEN - with infra-red broiler, Caloric Ultramatic, propane, stainless steel finish, very good cond., $75 or best offer; kitchen cabinets and counters, all formica, various sizes, from a 12'x18' kitchen, good cond., all for $250. Ext. 2492.

HUMIDIFIER - cold water, new, $10; 8mm projector, camera, editor, floodlights, filters, $25. 698-3822 eves.

13" SANYO B&W TV - 9 mos. old, asking $50; 19" color TV, w/remote control, 9 mos. old, asking $430. 981-9584 eves.

SKI JACKET - boy's size 10, good cond., $10. Susan, Ext. 4267.

BB COUNTERTOP - new, $30; triple dresser w/mirror, walnut, $60; aluminum cable, 3-wire #6, $15. 286-4650.

COLLECTOR DISHES - from the 60's, Royal Copenhagen and B&G, very reasonable, Ext. 2888 or 286-0422.

MET TICKETS - 3/8/83, LaBoheme, 8:00 p.m., at trio rate, 2 avail. Betty, Ext. 7120 or 7126.

CHAIN - 14 kt. gold, herringbone, extra heavy, 18" length, bought new for $450, selling for $270. Ext. 4444.

PIRATE CHEST - tropical hardwood, dome-top, metal fittings, $65. Ext. 7141 or 288-3216.

SNOW BOOTS - boy's size 7, $7. 928-6930.

STONEWARE - 3 piece service for 6, beige/brown, $25; shoes, 9-west, 8M, tan, never worn, orig. $40, asking $15. Cheryl, Ext. 4207.

DRESSER - five drawers, with matching night stands, and two lamps, $100. Rick, Ext. 4100.

23" MAGNAVOX TV - in cabinet, needs new picture tube, $125. Ext. 7009.

HOCKEY TICKETS - (4), Islander vs. Hartford, Sat., Feb. 12. Russ, Ext. 2350.

MACRAME HANGING PLANT TABLES - 6' and longer, $80-$125. Cheryll, Ext. 4267 or 289-1585 eves.

KEROSENE HEATERS - Radiant King, discount prices, factory-sealed cartons, guaranteed. Jim, 924-7665 eves.

SOFA BED - ideal for den or playroom, $25. Roy, Ext. 2384 or 878-0074.

ATARI CARTRIDGE - Trick Shot (straight pool), $10 or best offer. 744-8063 days.

CONFERENCE TABLE - & 4 chairs, $225; TV console w/radio hi/fi, $150. Rich, Ext. 7932.

COMPUTER - ZX-81, used once, asking $75; Westbend humidifier, Swan VHF swr/pwr meter; Micronta Digital VOM. Don, Ext. 4551 or 281-3093.

BELT MASSAGER - good cond., $45; clock thermostat, 2 wire, 24 volt, used 1 week, $40. Ext. 4679.

TABLES - (3) Lane, coffee, step & square, fruitwood, good cond., $150. Jerry, 475-5591 after 6 p.m.

WEDDING GOWN - never used, sz. 9, $150. Tommie, 698-2537 after 4 p.m.

DENIM JACKET - w/picture of Jim Morrison painted on back; electric guitar w/whamee bar, $20. Rose, 744-5069.

SEWING MACHINE - Singer, $75; step stool, $20; bookcase headboard, $25; quartz heater, $30; new toaster oven, $45; 2 table lamps, $25/ea.; electric knife, $20. 744-6874.

CHILD'S DESK - w/attached swivel seat, excel. cond. 821-1042.

OIL BURNER - Beckett, less than 1 yr. old, $75. 585-8809 eves.

ROCKING CHAIR - colonial, dark maple finish, 6 mos. old, like new, paid $175 sell for $120. Bob M., Ext. 2514.

OAK COFFEE TABLE - $25; china cabinet, ball foot, $495, 3 piece bedroom set, $125; student desk, $5; single bed frame, $3; pine storage cabinet, $30. 924-4685 or 751-8240.

COMPUTER - TRS-80, color, 4K RAM, datacorder, joysticks, 2 program packs, manuals, cables, new, $300. 589-8394 eves.

DESCRAMBLER - for cable TV, new, $169. 654-1731.

HANGING LAMPS - & candelabra, wrought iron, best offer. Lois, Ext. 4904 or 929-4753.

BLANK CASSETTE TAPES - BASF, C-90, Pro II, CrO_2, $2.75/ea. Ext. 2521 or 928-8379.

CUSTOM STEREO - solid wood console, excel. components, receiver, turntable, speakers, best offer. 878-2233 after 6 p.m.

ICE SKATES - boy's sz. 2; girl's sz. 1, $5/ea. Richie, Ext. 2175 or 734-7342.

ATARI COMPUTER - 400 w/basic module, $250. Ext. 3941 or 744-8632 after 6 p.m.

STEREO CONSOLE - $60; hi-riser, $40; cocktail table, $30; hutch, $15. 331-2270.

SOFA/BED - brand new cond., colonial print, queen sz., hardly used, paid $425, asking $300. 929-8748.

DINING ROOM TABLE - & chairs, solid pecan; weights & bench; sofa. 744-1845 after 6 p.m. and weekends.

G.E. FOOD PROCESSOR - $20; other kitchen utensils. 821-1039.

LADIES BIKE - Ross Gran Tour II, new lightweight 10 spd., $160. Ext. 3890 or 924-4250.

CHAIN SAW - Stilh, 15" bar, excel. cond., $100. Ext. 3499 or 981-7369.

SKI PANTS - men's 34-R, drk. blue, stretch wool & poly., never worn, $80. Ext. 4727.

BABY SWING - new, $20; other baby items; glassware; bathroom window curtains, never used. 924-0582.

FIREWOOD - full cords, 4'x4'x8', $115 delivered. 467-8976.

PAINT - (3) gallons Fuller O'Brien exterior flat pale yellow "Cafe" color, $30. Ext. 5180.

RANGE HOOD - new, excel. cond., avocado green, 36", $25. 744-9677.

PROJECTOR SYSTEM - Airquipt, remote control, (12) 100 slide reels, screen, $45. Jack, Ext. 4411/5231 or 929-8287.

KEROSENE HEATER - Corona DKB, 22,600 BTU, 55 gal. drum; 5 gal. can & elec. pump, $150; queen sz. mattress, box & frame, only 1-1/2 yrs. old, $175. 981-9584 eves.

Free

WROUGHT IRON HAND RAIL - approx. 4' rise, needs paint; assorted aluminum downspouts and elbows, approx. 50' total, no holders, you pick-up. Ext. 3274.

BLACK PUPPY - abandoned, well behaved, loveable. 363-2736 after 5:30 p.m.

TV - b/w, RCA console, needs work. Augie, Ext. 2419 or 325-0594 eves.

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

WADING RIVER - custom colonial, SWR school district, wooded, 4 bdrm., d/r, den, f/p, 2 car garage. Ext. 7727 or 929-4631.

For Rent

MILLER PLACE - north of 25A, near beach, avail. Feb. 15-Aug. 15, unfurn. or partly furn., prefer couple, or small family, no animals, $450/mo. Ext. 7532 or 282-3070.

PATCHOGUE - 4-1/2 rm., 1 bdrm. apt., includes heat, hot water, laundry, garbage pickup, cable TV, dock space avail., 1st floor, full end apt., $460/mo., avail. immediately. 286-8368.

BLUEPOINT - 2 bdrm. cottage, near bay, eik, l/r, full attic, basement, ideal couple, 1 child. $400/mo. Ext. 4639.

BERKSHIRES CHALET - 3 hrs. from NYC, 3 bdrms., 2 baths, fully equipped kitchen, elec. heat, deck w/spectacular view, near lake, hiking trails, near ski areas, cross country skiing on property, avail. weekends or weekly. 929-6946 after 6 p.m.

VERMONT - 3 bdrm. house, f/p, fully equipped, beautiful view, x-country & downhill skiing, reasonable vacation, family oriented, avail. weekly/weekends. 732-6499 after 6 p.m.

SOUND BEACH - spacious 1 bdrm. apt., full bath, sun porch, yard, walk to beach, $430/mo. incl. util. Rose, Ext. 7908 or 744-3160 after 6 p.m.

MANORVILLE - Pine Hills, 1 bdrm. chalet, extras incl., f/p, dishwasher, garage & prime location, 10 mins. to Lab, $420/mo. incl. heat, golf, tennis, pool. 654-3041.

Car Pools

UNIONDALE - have small car, join or form 3-man pool, 8:30-5. Vic, Ext. 2050.

BABYLON/WEST ISLIP - driver needed for 4-person on-time car pool. Ext. 2500.

RONKONKOMA - driver to join 3 person pool, LIE exits 59, 60 & 61. Victor, Ext. 2395.

HUNTINGTON/GREENLAWN - driver needed for existing car pool. Jim, Ext. 5057.

ROCKY POINT AREA - would like to start or join car pool. Chris, Ext. 3744.

Wanted

TRAINS - Lionel, any "O" gauge or "027" gauge cars, track and equip. Frank, Ext. 3120.

TRAINS - Lionel, American Flyer, access., any cond. brings good price. Carole, Ext. 3362 or 924-4097 eves.

POTTERY WHEEL - electric. Ed, Ext. 4768.

WATCH DOG - to adopt, good disp., preferably german shepherd or equal, house broken, about 1 yr. old, assured good home. Ext. 2492 or 475-8658 after 6 p.m.

BOY'S ICE SKATES - in very good cond., size 2. Ext. 2888.

PEOPLE - with writing skills, for free-lance work on public relations projects. 286-8664.

METAL WORKING ENGINE LATHE - gear-head or belt drive. Tom, Ext. 2613 or 281-4080.

RABBIT - red satin male or female. Peter, 924-8522 after 7 p.m.

MUSICIANS - forming chamber music group. Carol, Ext. 2907.

FUEL OIL - converted to natural gas heating, will buy your unused fuel oil. Don, Ext. 4167.

TIRE - E78x14 or equivalent, must be better than passing and not snow. Morris, Ext. 4192.

STORE - to rent or buy, with or without living quarters above or behind. Ext. 2903.

VAN - 1975-80, good cond., reasonable. Ext. 2903.

ATARI OWNERS - to share software, ideas, group purchase, etc. Marty, Ext. 3941.

MATURE PERSON - for child care and housekeeping in our home, 20 hrs./wk., E. Patchogue. 286-2155.

HOT WATER HEATER - used, electric, doesn't have to be in workng cond. Ernie, Ext. 3357.

HOME - for spayed female mixed breed, very friendly, good watch dog, loves children. Lois, Ext. 4904 or 929-4753.

PERSONS INTERESTED - in forming a German language discussion group. Ken, Ext. 7959.

INSTRUCTOR - for beginner sewing class. Ext. 3565 or 878-2233 after 5:30 p.m.

ROOMMATE - share comfortable 3 bdrm. condo in Ridge, 5 min. to Lab, w/w, washer/dryer, cable TV, $210/mo. + 1/2 util. 924-0309.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommended by the ***Bulletin****.*

PET BOARDING - grooming, indoor/outdoor runs, cat facilities, p/u & delivery avail. Tony, 288-3535.

BABYSITTING - my house in Shoreham, all ages welcome, playmates, refs. 821-0599.

GENERAL CONTRACTOR - carpenter, extensions, dormers, garage conversions, basements, decks, kitchens, licensed. Jim, 698-2501.

CARPETS INSTALLED - repaired, quick dependable service, free estimates. Jim, 821-0187 after 5 p.m.

PROFESSIONAL INCOME TAX SERVICE - by experienced preparer, IRS enrolled. Jack, Ext. 7942 or 864-2236.

TRUCK FOR HIRE - no job too small, Lab discount. 281-5445.

EXTERMINATING - licensed men, guaranteed in writing, over 15 years experience, free estimates, Lab discount. 281-5445.

WATERPROOFING - all work guaranteed in writing, over 15 years experience, free estimates, Lab discount. 281-5445.

ELECTROLYSIS - L.E.E.S.A. physician, trained, latest method, free consultation, evening appointments avail. 331-4768.

SHEETROCK & SPACKLING - free estimates. Kevin, 567-6651.

MOTORCYCLE PARTS - access., for all makes and models, expert repair. 325-9580 after 6 p.m.

LIMO SERVICE - luxury chauffered, for proms, weddings, airport, all occasions. Roy, Ext. 4664 or 744-8779.

CHILD CARE - fenced yard, lunches, snacks, playmates, continuous supervision and TLC, reasonable rates, refs. 399-5407.

PLUMBING AND HEATING - Lab discount. John, 654-8189.

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

MASONRY - spackling & taping, general contracting, reasonable rates. Walter, 878-8320.

INCOMES TAXES - prepared by expert tax accountant, low fees. Bob, 286-5829.

WORD PROCESSING INSTRUCTIONS - hands on practice, 10 easy lessons, free introductory lesson. Janie, 698-2710.

PAINTING - panelling, wallpaper, carpentry, references provided upon request, free estimate. John, 924-5012.

HOUSEKEEPER - seeking employment on north shore, reliable, thorough, own car. Ext. 3744 or 821-9781.

VW PARTS - full line of EOM at wholesale prices, complete machine shop service for VW. Augie, Ext. 2419 or 325-0594 eves.

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