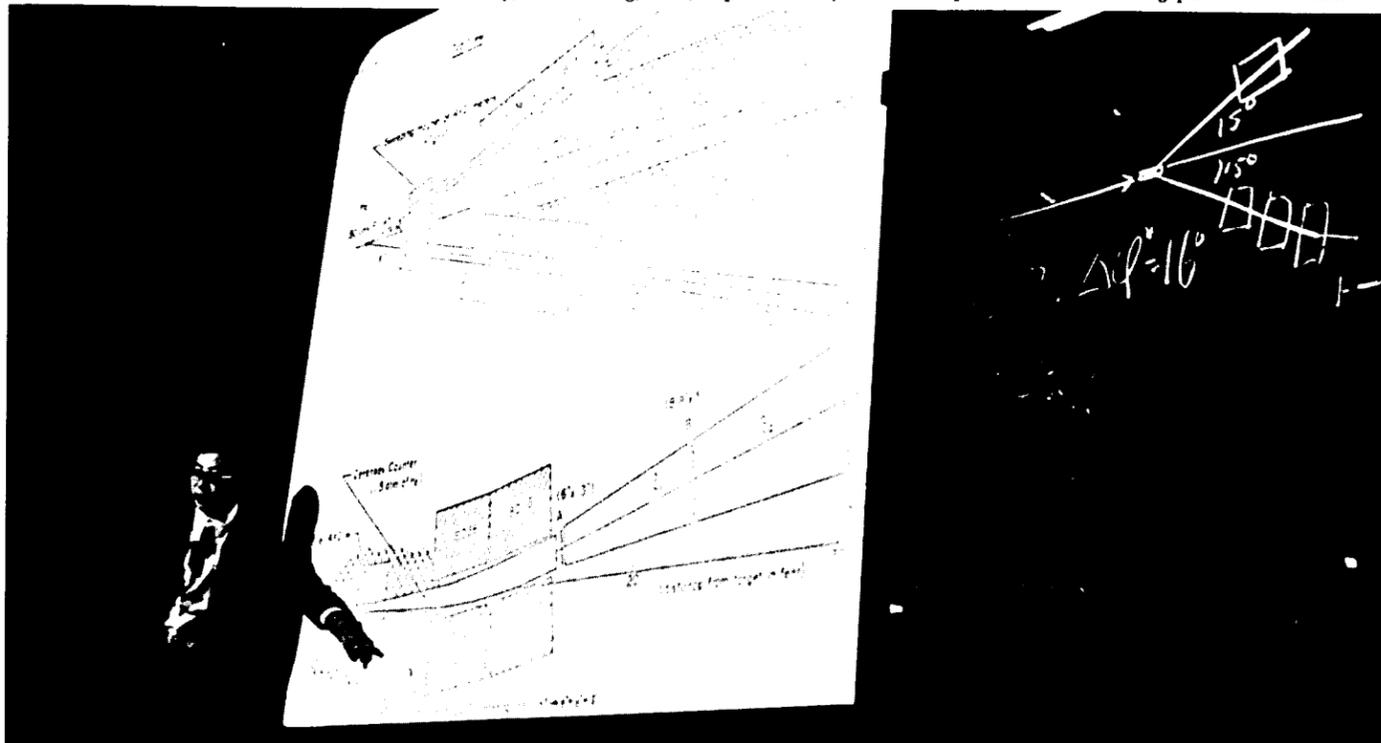


Before a capacity crowd in Berkner Hall on Monday, Samuel Ting, MIT, explains the layout of the experiment in which the J-particle was found.

# J



## BROOKHAVEN BULLETIN

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# Physics Discovery Of The Decade Made At The AGS

## The MIT/BNL Experiment

Horst Foelsche

The discovery of the J-particle promises to unlock a number of exciting mysteries which had arisen in the analysis of earlier experiments at the AGS, at Fermilab, and in the colliding beam facilities at the CEA and at Stanford (SLAC).

For some time now there have been indications of a high rate of direct production of single electrons and muons in high energy collisions of protons with matter. On the other side of the puzzle, recent experiments at the electron-positron colliding beam facilities at Cambridge (CEA) and at the SPEAR facility at the Stanford Linear Accelerator Center, had revealed anomalies in the rate of production of hadrons in the collisions of electrons with positrons. Two early experiments at the AGS four years ago had shown an excess in the direct production of muon pairs, i.e., muons made in association with their antiparticles of opposite charge. The experiments were too imprecise however to reveal whether or not the muon pairs came from the decay of a single parent particle.

### Simultaneous Detection

More recent experiments have determined a ratio between the production rates of electrons or muons and of pions, but these experiments involved the identification of single electrons or muons together with an unanalyzed collection of other particles. The recent decisive MIT/BNL experiment was the first where electrons and positrons produced in interactions of a proton beam in a stationary target were detected simultaneously, in coincident pairs, in a precision double arm spectrometer. In the spectrometer the energy of each of these two particles was determined with sufficient precision so that one was able to show unambiguously that both were originating from a single parent particle, the J-particle, which in turn decayed into the electron-positron pair.

The simultaneous confirmation of the existence of the new particle at the SPEAR facility provides a striking example of the complementary nature of the various experimental techniques used in high energy physics research. While the MIT/BNL team established the direct production of the J-particle in high energy proton collisions on a stationary target (Beryllium in this case) and its decay into electron-positron pairs, the SPEAR team established the existence of a sharp peak in the production rate of hadrons in electron-positron collisions at exactly the same effective mass, and provided more precise evidence for the particle's unexpectedly long lifetime.

The AGS at Brookhaven National Laboratory operates in an energy domain where

many new aspects of nuclear forces are being uncovered and are expected to continue to be uncovered in the future. The rich field of subnuclear spectroscopy which is under intensive investigation at the AGS, has been expanded into new areas by this recent discovery. A wide variety of "probes" for the exploration of elementary particle interactions are maintained by the Laboratory on the experimental floor of the accelerator.

### Primary-Secondary Beams

The primary proton beam accelerated in the AGS is not only used as a direct probe of nuclear structure, but it is intense enough so that it is used to create a diverse set of secondary beams. Beams of mesons, of pro-

tons, of muons, of antiprotons, of neutrino particles and even of short-lived hyperons, all beams of variable energy, can be generated by plunging the primary proton beam into primary targets where its available energy is converted into a large number of secondary reaction products.

These secondary particles emerging from the target are selected and collected into beam channels leading to the experimenter's own apparatus. There the interactions of the particles with matter are studied in very specific detail. The experimenters have a choice of beam spigots most suitable for their particular experiment. It is possible to distribute the intense primary proton beam onto four of five primary target stations

(Continued on page 2)

## A J-Particle Is Born

Jean Burke

Excitement erupted when an announcement suddenly appeared over the T.V. monitors in the AGS building at one a.m. on November 11. It simply said, "Experiment 598 has discovered a new particle-J at 3.1 GeV." It was clear to all that they were witnessing the announcement of the most important physics discovery of the decade.

A new elementary particle had been found. The discovery was totally unexpected and a surprise to everyone. Responsible for the astonishing find, was a group from MIT headed by Samuel Ting of MIT and Y.Y. Lee of BNL.

The new particle was christened "J" because of its strong angular momentum. The letter J is frequently used in mathematical equations as a symbol for angular momentum. Coincidentally, the letter J is almost identical to the Chinese character for Ting.

The significance of the discovery lies in the particle's two unexpected properties, which lead the group to believe that it is not a member of any known particle family.

Particle-J is extremely heavy, having a mass equivalent to three protons. For such a heavy particle it has an amazingly long lifespan. Before decaying into an electron-positron pair, the particle lives for a billionth of a billionth of a second ( $10^{-18}$  sec). Most elementary particles do not live longer than  $10^{-24}$  sec.

The particle was first seen by the MIT/BNL group last August and again in October. The discovery was kept secret until last week because the group wanted to verify their valuable find.

It was quite evident that the particle was genuine when the Stanford Linear Accelerator Center (SLAC), using a completely different technique, also found the particle. Since then the Frascati Laboratory in Italy has also reported seeing the particle.

In writing up their preliminary results, Frascati said, "Soon after the news that a particle of 3.1 GeV with a width consistent with zero had been observed at Brookhaven by the MIT Group, it was immediately decided to push ADONE (the Frascati accelerator) beyond its nominal limit of energy to look for this particle."

The experiment is one of the most complex to be set up on the AGS floor. Because of the radiation produced by protons bombarding the target, the equipment was imbedded in 10,000 tons of concrete and steel shielding. Close to 10,000 lbs. of soap (borax) were used to shield against neutrons. "When we went to the market and asked for 10,000 lbs. of soap, they thought we were crazy," recalls Ting. The experiment is essentially an outgrowth of a series of experiments which the group has been

(Continued on page 2)



Inside the trailer "where it all happened" are (standing left to right) Samuel Ting, Gary Krey, Y.Y. Lee, Peter Biggs, Paul Goldhagen, and Bruce Bailey. Seated in the foreground (left to right) are Ingrid Schulz, Joseph Leong and Sau Lan Wu. A graphic representation of the J-particle event is seen.

Photos by Humphrey



Samuel Ting (left) and Ronald Rau (right) introduce part of the BNL/MIT Group that discovered the J-particle, at a press conference held at the Lab on Monday.

**J-Particle**

(Continued)

doing at DESY in Hamburg, Germany for many years.

"It was nearly three years ago when Sam Ting walked into my office and said, 'I would like to propose a double armed spectrometer experiment to look at the production of lepton pairs,'" remembers Ronald Rau, Associate Director for High Energy Physics. Nearly two years later, in April 1974, the spectrometer was built and the experiment started its historic run.

Since then, the MIT/BNL Group has worked long hard hours to achieve their goal. Over the last few months the group members have been working 12-hour shifts, taking time out only for a quick bite to eat. A microwave oven in the trailer and a refrigerator nearby provided easy access to meals.

An interesting sidelight to the experiment is the international nature of the people involved. Of the 15 group members, eight represent different countries. Y.Y. Lee, the only BNL member, is from South Korea. The MIT Group included: Samuel Ting, born in the U.S. but raised in China; Ulrich Becker, from Germany; Min Chen, from Taiwan; Peter Biggs, from England; Joseph Burger, U.S.; Glen Everhardt, U.S.; Paul Goldhagen, U.S.; Joseph Leong, from



Y.Y. Lee

Hong Kong; Tom McCorrison, U.S.; Terry Rhoades, U.S.; and Sau Lan Wu, from Hong Kong, Jean Jacques Aubert, a visiting staff member to MIT from France and Martin Rhode, from DESY in Ger-



Laboratory Director George Vineyard (right) with Y.Y. Lee, Sau Lan Wu and Samuel Ting (left to right) in the MIT trailer where the J-particle was discovered.

many are also members of the group. Gary Krey and Ingrid Schulz were among the many technicians participating in the experiment.

Besides the group members, there were many AGS staff members who contributed their time to the success of the experiment. The entire crew of the AGS Experimental Area Operations, under the direction of Bill Walker, Lance Chimienti and Rod Di Girolamo, were very helpful. Horst Foelsche, Experimental Planning and Support Division Head, and Lyle Smith, AGS Division Head, contributed much of their time to the experiment. Tom Blair, was the liaison engineer from the experiment. The External Beam Group and the entire crew of the main AGS control room, exerted a lot of effort.

When the excitement from the discovery dies down, the MIT/BNL group will start taking a closer look at some of the properties of the J-particle. They are also planning to look for more heavy particles in the region of 3.5 to 5.5 GeV.

The discovery of the J-particle was officially announced by BNL during a press conference held at the Lab on Monday, November 18. Samuel Ting explained his group's discovery and then he and Ronald Rau answered questions from the press. The press was then taken on a tour of the experimental area.

Earlier in the day, Ting had given another presentation on the new particle before a capacity crowd in Berkner Hall.

What does this discovery mean to the Physics world? According to Rau, "It could be the first in a series of clues that tell us something about the fundamental forces of nature which hold the nucleus together, something we have been studying in physics for the last 20 years."

The findings of the MIT/BNL Group will be published in the December 2 issue of Physical Review Letters, a professional journal of physics.

**Experiment**

(Continued)

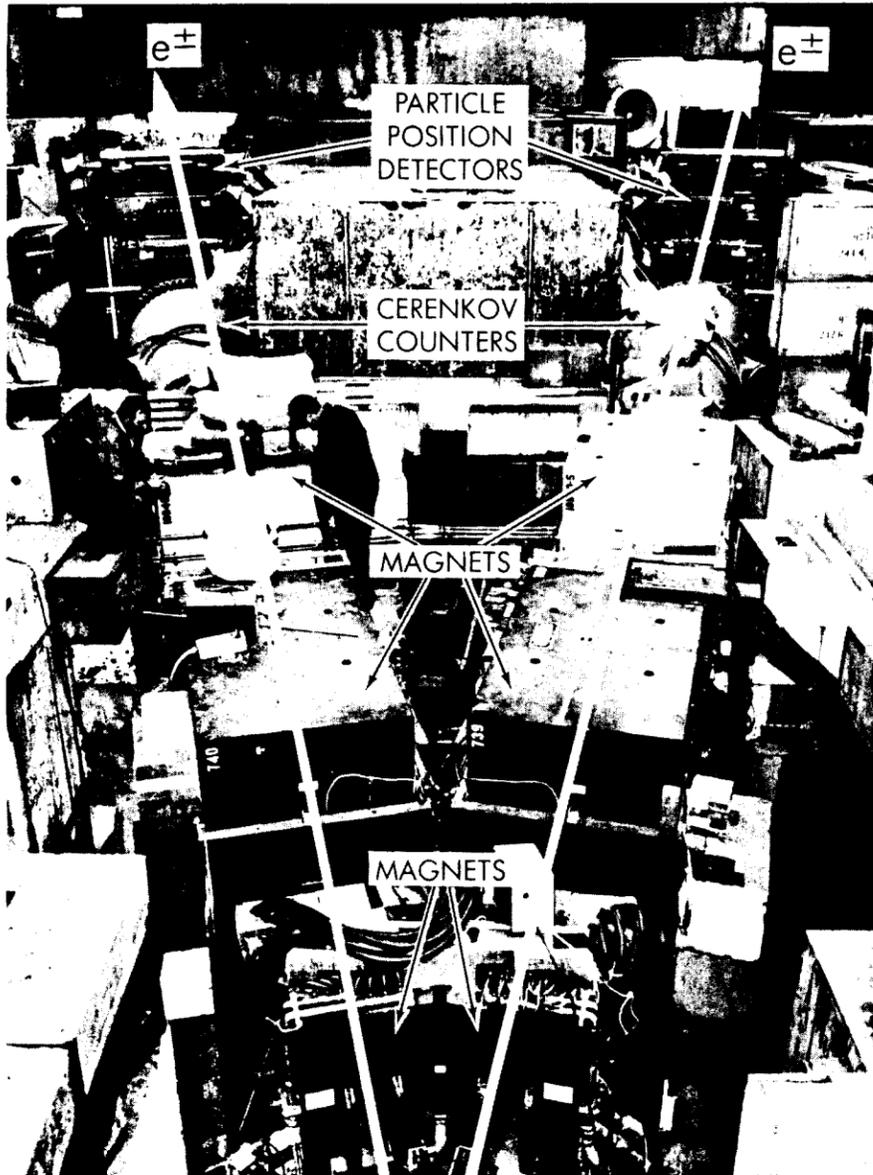
simultaneously, each station having several secondary beams with one or two experiments set up in each. Thus the accelerator can service a large number (at present up to 10) of experiments simultaneously.

**Complex Experiment**

The experiment which led to the discovery of the J-particle is one of the most complex to be set up on the AGS experimental floor. It has not only required a very large commitment from the MIT Laboratory for Nuclear Science, but the construction of the elaborate setup has required an extraordinary fraction of Brookhaven's experimental support resources.

The experimenters from MIT constructed a large amount of apparatus such as special magnets, large Cerenkov counters for the discrimination against signals from less interesting reaction products, special lead glass counters for the unambiguous identification of electrons and positrons, and wire chambers for the precise detection and reconstruction of particle trajectories in the spectrometer. The correct operation of all this assembled gear was monitored by an on-line computer.

A team of Brookhaven physicists, engineers, and technicians, on the other hand, designed, constructed, and operated a special primary beam branch transporting the protons from the accelerator to the target of the experiment. Especially close cooperation between the two teams at the conceptual stage was called for in the design of the proton transport beam line, and in the detailed layout of shielding to protect the apparatus from spurious stray radiation which could interfere with the detection of the desired signal. One of the Brookhaven physicists is continuing to collaborate with the experimenters from MIT in the analysis of the results on computers of the Laboratory's Central Computing Facility.



The MIT/BNL double armed spectrometer used at BNL to discover the J-particle. The superimposed sketch shows the paths of the electron and positron through each of the two 70-foot arms of the spectrometer. The three magnets and the Cerenkov counter, in each arm, allow the precise identification of the particles and their energy. The target, into which the 30-GeV protons from the AGS crash to produce the new J-particle along with myriads of other particles, is out of view at the bottom of the photograph. While operating, the equipment is embedded in nearly 10,000 tons of steel and concrete.



Standing on top of 10,000 tons of concrete and steel shielding, which embeds the double armed spectrometer, are (left to right) Joseph Leong, MIT; Peter Biggs, MIT; Y.Y. Lee, BNL; Sau Lan Wu, MIT; Paul Goldhagen, MIT; Samuel Ting, MIT; and Tom Blair, the BNL liaison engineer for the experiment.

## Application Deadline Soon For Craft Program

The application deadline for the Craft Apprenticeship Training Program is Friday, Dec. 6.

Since 1969, when the program started, six employees have graduated and three are currently receiving specialized training in the machinist and electrician trades.

Up to six additional employees will be selected for training in the machinist, carpenter, electrician, or refrigeration and air-conditioning trades. During the four-year training period, each apprentice will be given on-the-job training and will be required to complete a course of formal study related to the apprenticed trade.

Applications are being sought throughout the Laboratory from all employees regardless of race, sex, or religion. Successful candidates will not suffer any loss of pay because of the program, and in many cases will receive enhanced pay.

Full details of the program are available through the counseling services of the Personnel Office. Interested employees may call Ric Villacara, George Sabine or Virginia Wilson for further information. Applications are available at the Personnel Office at 58 Brookhaven Avenue.

## Belmondo and Moreau Star in Film Comedy

Two superstars of the French cinema, Jean-Paul Belmondo and Jeanne Moreau, team up in *Peau de Banane* (Banana Peel), the movie to be presented in Berkner Hall, on Tuesday, December 3, at 8:30 p.m. This film, made in 1965, was the first directed by Marcel Ophuls; those who are familiar with his recent documentary "The Sorrow and the Pity" may be pleasantly surprised by this high-style comedy melodrama.

The title comes from the name of a race-horse Michel (Belmondo) bets on - and loses- but it could also refer to the slipperiness of the plot. Early on in the story, Michel runs into his former wife Cathy (Moreau), who is out to swindle (to the tune of four million pre-inflation francs) the men who had bilked her father in a crooked financial project in South America. One bad turn deserves another, and soon there are twists, reverse twists, double-crosses, and quadruple-crosses. It all sounds very complicated, but Belmondo and Moreau can pull it off if anyone can. Here are some critical comments that appeared when the film was released:

"Beautifully sharp, authentic settings in Paris, on the coast of Brittany, and along the sparkling French Riviera . . . give an air of urbanity to the whole thing and fit in with Mr. Ophuls' slick, crisp style."

—Bosley Crowther, *New York Times*

"*Banana Peel* has a plot as tricky as its title. Viewers will never lose interest thanks to two shrewd performers, Jean-Paul Belmondo and Jeanne Moreau." —*TIME*.

*Peau de Banane* is in French with English subtitles. The showing is sponsored by the BNL French Group, who invite non-members to attend also. A donation of \$1.50 to help cover the film rental will be requested of non-members.

## Official & Special Events

Thursday, November 28

Thanksgiving - Holiday

Friday, November 29

Day after Thanksgiving - Holiday

Tuesday, December 3

Suffolk County Officials Meeting - Room A, Berkner Hall

Wednesday, December 4

Technology Utilization Conference - Berkner Hall

Thursday, December 5

Atomic Industrial Forum - Berkner Hall

**BROOKHAVEN BULLETIN**

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## Chinese Delegation Visits Lab



On Monday, Nov. 18, the Plant Photosynthesis Delegation from the People's Republic of China visited the BNL Biology Department. After being welcomed by Department Chairman Elliot Shaw, they were given a tour of the Photosynthesis Laboratory by Geoffrey Hind and of the Ecology Forest. They also heard lectures presented by various members of the Biology Department. They took time out after lunch to assemble for a picture. Standing left to right are: H.Z. Liu, BNL; Feng Yin-Fu, Deputy Head of the Chinese delegation; Geoffrey Hind, BNL; Chou Yueh-Chun, delegation member; Associate Director Victor Bond, BNL; John Olson, BNL; Yen Lung-Fei, delegation member; Shen Yun-kang, Head of the Chinese delegation; Li Liang-Pi, delegation member; and Y.Y. Chu, BNL. Seated left to right are Wei Chia-Mien, delegation member; Ru Fang Chen, BNL; Kuang Ting-Yun, delegation member; Helen Wang, BNL; and Chang Chi-Te.

Photo by Rosen

## Arrivals & Departures

### Arrivals

|                      |                 |
|----------------------|-----------------|
| Joseph Buscemi       | Plant Engrg.    |
| David R. Cozine      | Plant Engrg.    |
| Gerald Dennehy       | Applied Science |
| Hubbard Harris, Jr.  | Plant Engrg.    |
| Norman E. Holden     | Applied Science |
| Charles A. Kettner   | Biology         |
| Jan Kooistra         | Biology         |
| T. J. Reddick, Jr.   | Plant Engrg.    |
| Catherine A. Van Noy | Fiscal          |

### Departures

|                   |                 |
|-------------------|-----------------|
| M. Granger Morgan | Applied Science |
|-------------------|-----------------|

## Correction

The *Brookhaven Bulletin* recently announced that employees should make application at Personnel Services for dependent-student coverage under the Laboratory's medical insurance plan. This is not correct.

It is no longer necessary to make such application. All that is required is that employees demonstrate eligibility for their dependents (including full-time students over age 19) when they are submitting medical insurance claims on behalf of their dependents.

## CREF Unit Values

| 1974      |         |          |         |
|-----------|---------|----------|---------|
| January   | \$40.75 | February | \$40.83 |
| March     | 39.32   | April    | 37.58   |
| May       | 35.11   | June     | 34.29   |
| July      | 31.71   | August   | 29.09   |
| September | 25.39   | October  | \$30.27 |

## Letters To The Editor

Dear Sir:

I have seen numerous examples of hidden assumptions, artificial data manipulation, and pure numerology. "Final Results of BNL/SLAC Race," November 15, 1974 *Brookhaven Bulletin*, is my candidate for an award of demerit for obscure reporting of possibly valuable (scientific) information. SLAC, I presume, should receive the award for finding a way to make the data yield the "right" answer.

What is the age adjustment factor? What is the speed index? Why did BNL use eleven men and SLAC only six? (The top six from BNL obviously beat the top six from SLAC.) The three-inch table of "results" should have been deleted and the space used for at least a partial answer to these questions.

Gene L. Wells  
Assistant Editor  
Physical Review Letters

## The Secrets of Sleep

Is sleep a waste of time? Research into the functions of sleep suggests that in the modern world, where electricity has given us the option of eternal daylight, perhaps eight hours of sleep are more than many of us need.

On Sunday, Nov. 24, NOVA will explore "The Secrets of Sleep." The film challenges traditional notions about how much sleep we need; argues that all the pills taken for insomnia may do more harm than insomnia itself; and eavesdrops on a group session in which the hidden meanings of dreams are unravelled.

"The Secrets of Sleep" examines some of the theories of sleep, including the reasons for dreams. The film is a WGBH/BBC co-production.

The program can also be seen on Tuesday, Nov. 26 on Channel 21.

## Co-Ed Volleyball

Last Monday the Nuts & Bolts played 2 terrific games against The Best. I say only 2 games because they only played 2 games. They had to forfeit the first game because people like Bob Brown, Ken Ellis, his wife Louise, Mac, and Lindora were late; better known as stragglers. Not to mention the fact that Jackie Larrie and Lou Benbow couldn't make it at all.

I must say that The Best have a very good team. There were some very good volleys in both games which included people like: Emily, Louise, Ken Sutter, Joan and Juanita of The Nuts & Bolts. Not only that but there was also a cheering section - some of the children of the players were there to cheer them to victory.

The Nuts & Bolts' standing is 6 and 3 - if they keep up the good work and determination they could go far; and there are a few teams that wish that if they do go far they'd stay there.

—J. Benbow

## IBEW Meets November 25

Local 2230, IBEW will hold its regular monthly meeting on Monday, November 25, 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.

## Hospitality News

The next morning coffee will be held on Tuesday, December 3, from 10 a.m. to noon in Apartment 6A. Mrs. Cynthia Long will demonstrate interesting Christmas decorating techniques.

Come and bring the children.

## Poet's Theatre To Perform

Entrepreneur Bruce Martin has engaged The Poet's Theatre to provide the entertainment at the Theatre Group's meeting on December 3, at 8 p.m. at the Exhibit Hall. Directed by Charles Kellogg of Brookhaven, three plays with the collective title of "Techniques of Innocence" will be presented.

The three plays in the Poet's Repertory's current vehicle are: "I think it's called the sugar plum" by I. Horowitz. The cast is a tandem of Joy Greenwald and Bruce Martin. The twosome of Tom Michelsen and Joy Greenwald will act in a Jules Pfeiffer original as the second play.

Albert Deveroux's "Initiation" will be the final selection starring twinklers Martin and Michelsen. No songs but snappy patter will be elicited from the audience immediately following the show.

Come, fellow Theatre Group members and enjoy an entertaining meeting.

## BNL Postmaster's Letter

Dear Customer:

Each year the U.S. Postal Service has asked you to mail early to help us deliver your holiday mail on time. And, each year you have responded to our request with great success.

This year we need your help more than ever. Because of the interruption in United Parcel Service in the New York area, the number of packages we deliver has greatly increased. We have hired additional workers and opened more facilities to move the mail on its way.

To help us, we are asking that you mail your packages by November 30th and your cards and letters by December 5th. Be sure to include Zip Code in your address.

We look forward to serving you.

Steve Garrett  
Local Postmaster

## Bowling News

Grace Fales

### Green League

200's for the night: C. Bohnenblusch 202, A. Dick 225, R. Jones 203, F. Green 208, A. Kreisberg 204, A. Pinelli 207, J. Ferrero 208 and L. Jacobson 211/200/591.

### Red League

After 10 weeks of bowling the Lucky Strikes are still leading the league followed by the Old Timers and the Charlie Browns. Hi series of the night went to K. Asselta 689 Gross Series and R. Larsen's 224/209 618 Scratch Series, both Club Awards - congratulations. High games for the night were E. Fales 212, R. Nelson 220, D. Lingg 204, F. Short 200, K. Asselta 256, B. Buzzeo 209, J. Lee 208, N. Carter 228 and J. Scesny 203.

### Black and Blue League

The first third is over for eight teams. After ten weeks of competition, we have a tie for first place. In an exciting and well played match the "Good Guys" and the "Athol Regulars" ended the first third tied for first place with 47-23 records. After splitting the first two games, going into the third game the "Good Guys" had a 20 pin lead in total wood. In the third game Dot Pollock (avg. 118) rolled a 178 to give the "Athol Regulars" the game and total wood by two pins. A three game roll-off will be held at a later date to determine a first-third winner. High games for 11-13: Frank Costello 213/200, Jean Sells 199, Dot Pollock 178, Rosalie Piccione 177, Kit D'Ambrosio 175, Mary Austin 160. Pots were won by Kit D'Ambrosio 223 and Don Schug 217.

### Pink League

Congratulations to the Spares who held their first place position for the first third with the Swingers capturing second place. High game for the night was Marge Stoeckel with a 198 - beautiful! Exhibitions were given by Helen Keeley and Rene Rosati, converting the 4-7-9-10 and 4-7-9, respectively.

## No Bulletin Next Week

Due to the long Thanksgiving holiday, the *Brookhaven Bulletin* will not be published next week.

## Slo-Break Basketball

Dick Sutter

The BERA slo-break basketball league season started last Thursday with two hard-fought contests. In the first game the Persuaders, paced by their pair of small but superb guards Bob Rowley and Jim Jarrison, scored a decisive victory over the Condors. The game was even until midway in the third quarter, when the Condor offense faltered and the Persuaders' steady play opened an eight point lead enabling them to control the game the rest of the way.

The second game between the Spuds and the Roga (ask Lew Snead what this WFL sounding nom-de-plume signifies) was made of pure basketball excitement. The lead changed hands often and finally ended in a 54-53 victory for the Roga. The Spuds' attack was dominated by three men - Nordstrom, Samuelsen and McKeaver, who combined for 47 of their team's 53 points, while the Roga showed a balanced offense led by bit Ed Brown. Cheers also for a clutch one-hander by Jack Brennan in the closing moments.

## Service Awards - November

### Twenty-Five Years

Charles A. Boulton ..... Instrumentation  
Martha J. Hill ..... Medical

### Twenty Years

Peter A. Montemurro ..... Accelerator  
Daniel R. Oldham, Jr. .... Reactor  
Grace R. Seales ..... Applied Science

### Ten Years

Michael Carroll, II .... Health Physics & Safety  
Gilbert R. DeGregory ..... Accelerator  
John R. Doscinski ..... Staff Services  
Leo J. Fulhaber ..... Central Shops  
Franklin L. Leon ..... Health Physics & Safety  
Patricia F. Meehan ..... Physics  
Pierre A. Mercier ..... Plant Engineering  
James J. Roesler ..... Health Physics & Safety

## Payroll Savings Plan

Next week literature will be distributed to all employees giving information about the Payroll Savings Plan. Those who wish to enroll or to increase their allotment will be able to complete the application card and return it to the Payroll Supervisor in Building 134.

Payroll saving to purchase U.S. Savings Bonds is a sure way to build up a safe bank account for future use. Bonds are fully guaranteed for principal and interest and, if lost or destroyed, will be replaced free. There is no state or local tax on the interest earned by these bonds, and they can be cashed in at any time after the first two months. Unlike other bonds, Savings Bonds continue to accrue interest after their maturity date.

For painless saving, sign up for a small deduction each week or month and watch the bonds accumulate!

## Volleyball Leagues

The leagues have gotten off to a good start with six teams each. Two new teams in the Men's and one new team in the Mixed, and several fine new players in both. The standings after the second week of play are:

## Classified Advertisements

### Placement Notices

Each week the Personnel Office lists personnel placement requisitions, currently being processed. The purpose of these listings is, first, to give notice of all non-scientific staff positions being filled and, second, to give employees an opportunity to request consideration for themselves through the Personnel Office. In filling vacancies, the Laboratory's objective is to give first consideration to present employees, as follows: employees within the immediate group having the vacancy, employees within the department or division, employees within the Laboratory as a whole.

For further information regarding a placement notice, or to request consideration for an available position, contact Supervisor, Personnel Placement & Development, extension 2874 or 2882.

CARPENTER APPRENTICE (1) - Plant Engineering. Application deadline: December 6, 1974. Applications and additional information available at Personnel Office.

ELECTRICIAN APPRENTICE (1) - Plant Engineering. Application deadline: December 6, 1974. Applications and additional information available at Personnel Office.

REFRIG & AIR CONDITIONING APPRENTICE (2) - Plant Engineering. Application deadline: December 6, 1974. Applications and additional information available at Personnel Office.

MACHINIST APPRENTICE (2) - Central Shops. Application deadline: December 6, 1974. Applications and additional information available at Personnel Office.

47. CUSTODIAN - Plant Engineering.

48. PLUMBING SUPERVISOR - Plant Engineering Division.

### Autos & Auto Supplies

2-13" RIMS - Ext. 2926.

SEVERAL 14", 5-HOLE RIMS - Some are 6" wide. \$2 ea. Howie, Ext. 3531, PA7-4363.

65 FORD WAGON - \$175. Charlie, Ext. 4733.

67 CADILLAC COUPE DE VILLE - Tires & int very good, ext needs work. \$800. R. Nelson, Ext. 4417, 744-8949.

2 NEW TIRES - E78-14 mounted, used less than 300 mi. Ext. 3120, 475-4897 after 5.

73 OLDS TORONADO - All extras, only 17,000 mi. Ext. 3120, 286-0626.

70 GREMLIN - Good running cond. \$1000. 281-3977.

74 VEGA - Hatch Back, low mileage, runs well, used very little, must sell-moving. 588-4703 after 5.

69 CHEVY KINGSWOOD ESTATE WAGON - Air cond, ps/pb, elec rear window, V8. Asking \$850. 727-1329.

TIRE & WHEEL - 8.15x15 w/w. \$5. 289-1647.

2 SNOW TIRES - Mounted on rims, good cond, 7.00x13, fit Ford Fairlane. \$20/pr. Ed, Ext. 2460.

2-13" RIMS - 5 holes, \$7; 2-14" rims, 5 holes, \$8. O. Booker, Ext. 4719.

69 PLYMOUTH SPORTS SATELLITE - Air cond, power, like new. \$1200. 878-1424.

2 SNOW TIRES ON RIMS - H78-15 w/1 yr wear left, will fit most GM cars. \$25. 475-8079 after 6.

66 VW BEETLE - Fair cond, needs eng work. \$100. Frank, Ext. 2022, 281-3460.

14" CHEVY WHEEL - \$4. Ext. 2041.

70 PONTIAC EXECUTIVE - 2 dr hdtp, ps/pb, w/w. \$750. Ext. 2882, 584-5216 after 6.

73 VW SQUAREBACK - Bright orange w/sunroof, radial/mag wheels, many extras. \$2975 or best offer. 475-8728 eves.

64 OLDS DYNAMIC 88 - Runs well, good rubber. \$125. Ext. 3332, 929-8642 after 6.

TIRES - 4 new "Firestone 500" w/w steel belted radials, HR78-14. 2/\$90; 4/\$180. Jimmy, Ext. 2957.

69 FORD TORINO - Good cond, avail on or around Dec 10. \$1000 or best offer. I. Dormehl, Ext. 3205.

67 CADILLAC SEDAN DE VILLE - Full pwr, climate control, new tires, leather seats, best offer. 878-2829 between 3:30 & 6.

68 CHEVY NOVA - 6, ps, auto trans, 42,000 mi, excel cond. \$685. Ext. 4851.

69 FIAT 850 SPYDER - 32 mpg minimum, needs body work. 286-0880.

69 T-BIRD - 2 dr, vinyl top, ps, p/disk brakes, climate control, good cond, 56,000 mi. \$1495. JU4-6738 after 5:30.

71 VEGA - Hatch Back, 60,000 mi, 4 spd, 20+ mpg, radio, new brakes & exhaust, plus 2 snows on rims. \$1000. Ext. 3752, 744-9699.

### Boats & Marine Supplies

16' PEN YAN - Lapped sides, 40 hp Johnson, controls & trailer, very good. Howie, Ext. 3531, PA7-4363.

### Miscellaneous

WOOD STORM WINDOWS - 3-30 3/4"x6 1/2", 2-31"x55", 1-36"x67 1/2", 1-31"x75 1/2", 1 storm door 36 1/2"x85". Make offer. 289-1647.

KITCHEN CABINETS - 8' long w/sink & hardware & 36" gas stove. \$200. 667-0517.

RALEIGH GRAND PRIX - W/suntour GT derailer, 14-32 cluster, also rack & extra Simplex derailer & cluster. \$95. Charlie, 928-1121 after 4.

ANTIQUA BIRDEYE BUREAU - \$35; boy's slacks, \$3; jackets, size 12-20, \$4 & \$5. A. Munsterman, 744-5871.

1973-24' PULLMAN CARRIAGE TRAILER - Self contained, sleeps 5, many extras. \$5900. Marie, Ext. 3155/3143, 732-6137 eves.

2 TICKETS - To "Wheres Charley" Thurs 12/12 at Uptown Circle in Square Theater w/parking discount. Ext. 3855.

STAMPS - USA, England & Colonies, others. 281-9020.

FISHER FM/STEREO RECEIVER - BSR turntable, very good cond, reasonable. Ext. 2053.

BABY CARRIAGE - Good cond, \$10; alum storm door 36"x80", needs glass only, \$7; girl's 20" bike, needs tires, \$6. Frank, Ext. 3531.

OUTGROWN SKI BOOTS SALE - Excel cond, 1 pr Nordica ladies, size 6, \$20; 1 pr Kastinger size 5 1/2, \$20; 1 pr Reikle, size 4 1/2, \$10. 286-1046.

ENLARGER - Federal Model 250 w/condenser lens, 2 lg trays 16x31", safelight, Kodak timer, all excel cond. \$45. Ext. 4240, 286-0295.

GUITAR - Hoffner 12-string w/lined case, excel cond. \$175. 369-2633.

KITCHEN CABINETS - Upper & lower, birch, s/s sink w/counter, wall oven, counter top stove w/hood, elec, breakfast bar w/2 stools. Compl \$600. 981-1692 after 3.

MEN'S SHOES - 8 1/2-9 1/2, practically new, genuine leather, blk. Ext. 2926.

COLLECTOR'S ITEM - One of first RCA table TV sets made, still works, yours for the hauling; ice skates, size 4 1/2, new cond, \$5; skis, 5'3", cable bindings, \$2. 941-4328.

70 SNOWMOBILE - Ski-Doo Nordic, 24 hp, elec start, Ski-Boose, 1970 Sylva trailer. L. Emma, Ext. 3324, 744-2404.

BEAUTYREST SIMMONS MATTRESS - Dbl, 2 mos old. Pd \$150, sell \$75. 924-4962.

SHOWER STALL - H/w heater, mimeograph, bureau, chest, console TV. 924-4962.

TAPE RECORDER - Player system, AKAI, Model M-10, microphones, 25-7" reels w/tape. Howie, Ext. 3531, PA7-4363.

TORO SNO-PUP 14" SNOW-THROWER - Rebuilt carb, excel cond, best offer over \$50. W.S. Hillman, Ext. 3404, 472-1397.

SALTON BUN WARMER - Unused, orig pkg. \$10. W.S. Hillman, Ext. 3404, 472-1397.

STORM WINDOWS - Wooden frames, various sizes, good cond. Mrs. Kopp, EM3-6174.

CHILD'S PORT-A-CRIB - Oak Hill, cost \$40, sell \$10; safety gate, \$1. 286-2280.

20 GAL AQUARIUM TANK - All extras, pump, light filter, wrought iron stand. \$40. 475-6938.

FRIGIDAIRE - 13 cu ft, 2-door up/down w/100 lb freezer, excel cond, not an elec eater. Ext. 2016, 286-0716 eves.

MINI BIKE - 1973 Gemini, 80cc, 4 spd, excel cond. Rhodus, Ext. 3284, 924-3522.

BABY ITEMS - Conv stroll-o-chair high chair, stroller, carriage, bassinet, more, all excel cond. 289-0532 after 6.

BABY'S FOLDING DRESSING TABLE - \$4; heavy jumper seat, \$3; folding (birch wood) bed guard rail, \$2. 727-1329.

LUGGAGE RACK FOR SM CAR - Straps incl, 30" w. Paul, Ext. 4047.

CAGE - 4'h x 4'w x 8'l, 2"x2" wire mesh, 2x3 framing, stands 1' off ground. Asking \$35 (cost of materials). 924-3312.

BARBELL SET - 20 lb-5' bar, 2-5 lb dumbbell bars, 4-10 lb disks, 2-5 lb disks, 4-2 1/2 lb disks, 4-1 1/2 lb disks. \$10 firm. Jim, 924-3312.

12" STARRET HEIGHT GAUGE - \$25; 1/2 bag Sears concrete mixer, good cond, 1 hp motor (Tow bar & pneumatic tires), \$150. 732-3698 after 5.

WESTERN SADDLE - Suede seat, excel cond, \$100; horse blanket, \$20; asstd reins & bits. 878-1895 after 6.

EDISON CRIB - W/matt, dbl dropside, stabilizing bars, colonial maple, \$40; Bilrite coach carriage w/matt, \$80; Perego conv carriage. \$40. 732-7607.

ANTIQUA RADIO - \$7; old (78) phono records; TV console, beautiful cabinet, \$5. O. Booker, Ext. 4719.

BABY CRIBS - Std w/matt, \$20; portacrib, \$10; baby back pack, \$4. Ron, Ext. 4310.

6' COLONIAL HUTCH - Like new, 3 dr enclosed top w/light. \$280. 732-9387 after 5.

8' PICKUP CAMPER - 1966 Travel Queen w/icebox, gas stove & light, head, etc, \$650; need deer rifle/camping gear. Leo, Ext. 3272.

SINGER PORTABLE - W/wooden carrying case, very good. \$35. 585-8322 after 6.

SINGER ELEC SEWING MACHINE - W/"Queen Ann" cab, works. \$30. 585-8322 after 6.

1 WHITE AMER STD BATHRM SINK - \$15. HR3-2523 after 6.

MEN'S BIKE - 3 spd Raleigh, sealed beam headlight, good cond. \$55. 751-1588.

ROTOTILLER - 3 1/2 hp, excel cond. Marie, Ext. 3148.

LG BED - Dresser, vanity bench, nite table, beautiful set, reasonable; also extra dressers & beds, reasonable. Charley, 281-5385.

ORDER YOUR HOLLY HOBBIE DOLL NOW FOR CHRISTMAS - Sharon, 924-5482 after 6.

9" SOUTH BEND LATHE - 3 jaw chuck, face plate, collets & draw bar, turret tool post, quick change gear, threading dial, tool bits. \$400. 732-3698 after 5.

DIN RM BREAKFRONT - Server, table & 4 chairs, Drexel blonde mahog. R. Brehm, 744-8567.

STEREO STAND & RECORD HOLDER - \$8; 2 knic-knac shelves, \$3; ice skates, men's 11, women's 5, \$8 ea. 924-4442.

ANTIQUA COLLECTORS - 1889 Estey pump organ in good working cond & a fine piece of furniture. Ext. 4058, 878-0642.

### 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

SACHEM - 4 bedrm colonial, all appliances, extra insulation, great area for kids, taxes under \$1000. \$38,500. Barbara, Ext. 2902, 588-5537.

YAPHANK - Massive 7 rm ranch, 1/2 acre on quiet-safe cul-de-sac, swimming pool, 28x60 bsmt, 2-car garage, many extras. 924-3298.

MEDFORD - \$4000 over 8 1/2% mort, 2 bedrm Levitt house, expandable upstairs, full insulation, s/s, garage, 1/2 acre, low taxes. Ext. 3986, 289-5245.

HANDYMAN'S SPECIAL - 2 story house, mother/daughter, 2 bedrms & tile bath, din rm & kitchen on 2nd floor; 2 bedrms, tile bath, liv rm, din rm, kitchen, cedar closet, all lg rms, settle estate. 281-5385.

PATCHOGUE VILLAGE - 2 family house, 4 1/2 up, 4 1/2 down. Ext. 3143.

YAPHANK - 3 bedrm ranch, attached garage, low taxes, near Country Club. 924-3369.

### For Rent

2 BEDRM COTTAGE - 10 min from Lab on Artist Lake. \$200 + util. 924-6862.

1 BEDRM FURN APT - Beautiful, on beach in Rocky Pt. \$210 + util. K. Fuchel, Ext. 4116/4106.

TRAVEL TRAILER OWNERS - Vermont vacation season spot, avail util on 10 acres, 10 min to Okemo Mt & 7 other ski areas. 473-8186.

VERMONT VACATION - 3 bedrm mobile home w/ fireplace, 10 acres, 10 min to Okemo Mt, close to 7 other major ski areas. 473-8186.

MEDFORD - 2 bedrm house in residential area, full appliances, garage, extra storage area. \$275/mo. 289-5245 after 6.

NEW 2 BEDRM APT - 5 min from Lab, no children. \$250/mo, all util incl. 924-4250 after 6.

### Wanted

5' WHITE TUB - Right-handed. 924-4962.

HOME FOR MALE ST BERNARD - 22 mos old, AKC, papers incl, perf mask, excel w/children, well trained, needs larger quarters. 929-4949 after 6.

CAP - To fit on 8' Ford pickup. Mike, Ext. 4123.

4.00x8 TIRE OR WHEEL - For sm boat trailer. L. Decker, Ext. 4317.

INEXPENSIVE FOREIGN CAR - W/good gasoline mileage for 2nd car, must pass state inspection. Bernie, Ext. 4028.

14"-4 HOLE RIMS - To fit Ford product. Ext. 4452.

TELEPHONE ANSWERING DEVICE - Reliable. Sara, 744-4297.

USED TOYS & GAMES FOR YOUNG CHILDREN - Spirograph, Sorry, Erector, Battleship. Osgood, Ext. 3978, 286-2561.

GUITAR - For young music student, must be low priced. Gene, Ext. 4670, 744-3945.

CONVERTIBLE SOFA - Preferably modern & in good cond. J. Bussiere, Ext. 3501, 924-3303.

OLD FISHING TACKLE BOUGHT - Rods, reels, lures, etc., dig out that old tackle box, I'll take a look. Don, 286-1205.

16 GAUGE SHOTGUN - Marty, Ext. 3284.

CAST IRON STOVE - 4 or 6 burner, wood or coal burning. Richard, 585-6262.

### Carpools

BROOKHAVEN HAMLET - To form or join, 8:30-5:00. John, Ext. 4143, 286-1348.

RIDE WANTED FROM EASTPORT - 3 days/wk. Marie, Ext. 3148.

START OR JOIN CARPOOL - From Ft. Salonga area. J. Rothman, Ext. 3658.

### Services

E. Patchogue, Nov 23, 10-4, housewares & antique furn. Ext. 4562.

YARD SALE - Willing hands & loving hearts to help those that can't help themselves, Sat-Sun, Nov 23-24, 10-4, 115 Tuthill St, Pt Jeff, donations of usable items needed, benefit UNICEF. 473-1276, 929-8475.

### 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.
- Ads should be restricted to 20 words or less and typed or printed on the form provided, and must bear the employee's signature.

- For Sale: Auto & Auto Supplies  
 For Sale: Boats & Marine Supplies  
 For Sale: Miscellaneous

- Wanted  
 Carpools  
 Lost & Found  
 Services

Check  the heading applying to your ad. Print or type your ad in 20 words or less.

Ads concerning 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, Room 111, 40 Brookhaven Avenue.

Employee's Signature..... Life No..... Ext.....  
Send to: Brookhaven Bulletin, Building 460, 40 Brookhaven Avenue (Ext. 2345).