BROOKHAVEN BULLETIN
Volume 34 - Number 20 / May 16, 1980
BROOKHAVEN NATIONAL LABORATORY

Economics By Galbraith

Are the good years gone forever? From 1948 to the early 70's prices were stable, unemployment was low, and productivity was on the rise. As John Kenneth Galbraith put it, "A president seeing his economist in those days did not have a sense of revulsion."

Noted economist Galbraith spoke at Berkner Hall last week as part of the AUI Distinguished Lecture series. The title of his talk was "Economics and the Politics of Moderation." He addressed an audience so large that the overflow was accommodated in Room B, where TV monitors and an audio system had been set up. It seems that many people are interested in economics these days.

In the last decade, it has become increasingly clear that the good years have come to an end. In his talk,

Mort Rosen

John Kenneth Galbraith

Galbraith attributed this to three developments: 1) decline of the free market as big corporations, organized labor groups, and cartels such as OPEC gain more control of wages and prices; 2) increase in people's expectations as their consumption becomes less keyed to their class ("There is no longer any assumption that the education, or the clothing, or the automobile of one occupational group will be appreciably, perceptively different from another. . ."; and 3) changing work ethic ("As countries grow older, people work less hard. . .").

As Galbraith said, the consequences of these developments are readily apparent today: inflation, pressure for consumer goods, demand for public services, and no large productivity gains to offset higher wage claims.

He was critical of some of the actions taken by government to solve this country's economic troubles. Singling out one tactic pursued by a recent president, he joked, "Having discovered that small WIN buttons do not work very effectively against inflation, you design a larger WIN button."

The current monetary policy also came under his attack. "This is a great illusion of our time that this works," he said. Galbraith maintained that raising interest rates and restricting expenditures with money borrowed from banks results in a decline in capital investment, which in turn is damaging to productivity.

What would be better? Galbraith proposed some form of direct intervention on corporate prices and on wages, a long-standing philosophy of his. In doing this, he said, "one would not be attacking the market; one is attacking a problem that has been created by the failure of the market."

He also felt that there should be greater use of indirect taxation, particularly on luxury items, which would restrict the least necessary kind of expenditure. He pointed out, however, that in our economy, one can no longer single out certain items – automobiles, for example – as being luxury commodities. So taxes should be assessed on the upper end of all categories of consumption.

Aware of his audience, Galbraith commented that investment in organizations such as Brookhaven would offset some of the decline in productivity. "The advantage of the United States," he said, "is in the high technology, intellectually-based industries."

He added, however, that scientists and engineers should not think of themselves as being on the last frontier. "After things work in a passable way," he said, "people are mostly concerned with how they look." He concluded that the artist and the designer is "much nearer to God than the scientist and the engineer," a comment that drew chuckles and applause from the audience.

BNL Lecture:
Science In China

In 1978 the People's Republic of China began a serious effort to improve its agricultural system, its industry, and its science and technology. Its stated purpose was to match the pace of the Western world within a period of ten to twenty years. Such a purpose was a startling turnaround from the precepts which dominated China during the "Cultural Revolution," 1967-1976. During that troubled period science and technology were systematically demeaned, and internal "self reliance" was the big philosophy. To U.S. science observers the new outlook was made even more startling by the inclusion of High Energy Physics as one of the eight key areas which have the highest priority and thus the strongest support of the government of the People's Republic of China.

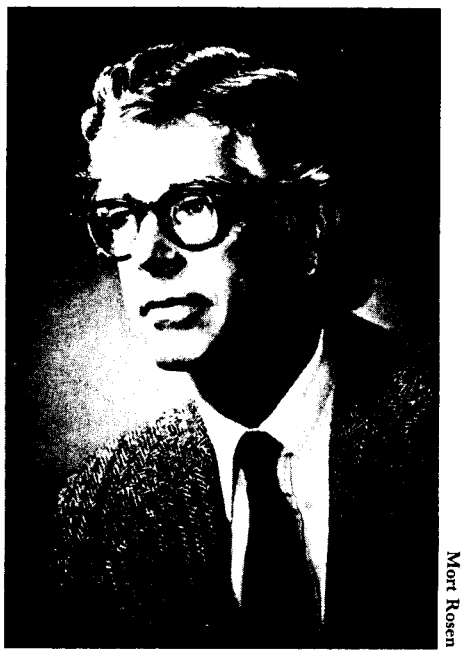
R. Ronald Rau, Associate Director of the Laboratory, has traveled extensively in China. He will speak on science in China at the next BNL lecture, Wednesday, May 21, at 8:00 p.m., in Berkner Hall.

Rau's lecture is entitled "Random Notes on Science and Technology in China – Past and Present." It is for anyone who is curious about China.

Brookhaven, together with Fermilab, SLAC, Lawrence Berkeley Lab, and Argonne, is aiding China in its plan to construct a 50-GeV proton accelerator. Rau says that BNL has a special role, since the AGS is the basic model for China's plans. Chinese scientists and engineers are visiting all of the laboratories in order to learn the appropriate and necessary technology needed for constructing a totally new high energy physics facility.

According to Rau, a visit to China is a fascinating adventure in history, in people, and in geography. Her modernization initiative may well be the most important experiment currently in progress anywhere. Only relatively recently have science historians of the West uncovered a wealth of information concerning science, technology, and invention in China over the past 3000 years.

R. Ronald Rau first came to Brookhaven in 1956 as a member of the Physics Department. He became Chairman of that department in 1966



Mort Rosen

R. Ronald Rau

and was appointed Associate Director of the Laboratory in 1970. He is also chairman of the Brookhaven High Energy Advisory Committee.

Rau holds a Ph.D. in Physics from the California Institute of Technology. His undergraduate degree is in Physics and Mathematics, from the University of Puget Sound.

He was an Assistant Professor at Princeton University from 1950 to 1956, where he was also engaged in research in cosmic rays and high energy particle physics. From 1954 to 1955, he spent a year in France as a Fulbright Research Professor of Physics at the Ecole Polytechnique. His research there was on "Strange Particles Produced by Cosmic Rays."

Rau received an Alumnus Cum Laude award in 1968 from the University of Puget Sound. He is also on the Board of Trustees of that institution.

He was a member of the Atomic Energy Commission's High Energy Physics Advisory Panel from 1970 to 1974, and he served on the Program Advisory Committee of the Los Alamos Meson Physics Facility from 1971 until 1974.

A buffet supper is served at 6:30 p.m. at the Brookhaven Center before the lecture. Many find it convenient and it is a pleasant way to meet members of other departments. Reservations for the buffet should be made in advance by calling Ext. 3541 before 5:00 p.m. on the day of the lecture.

Ship With Care

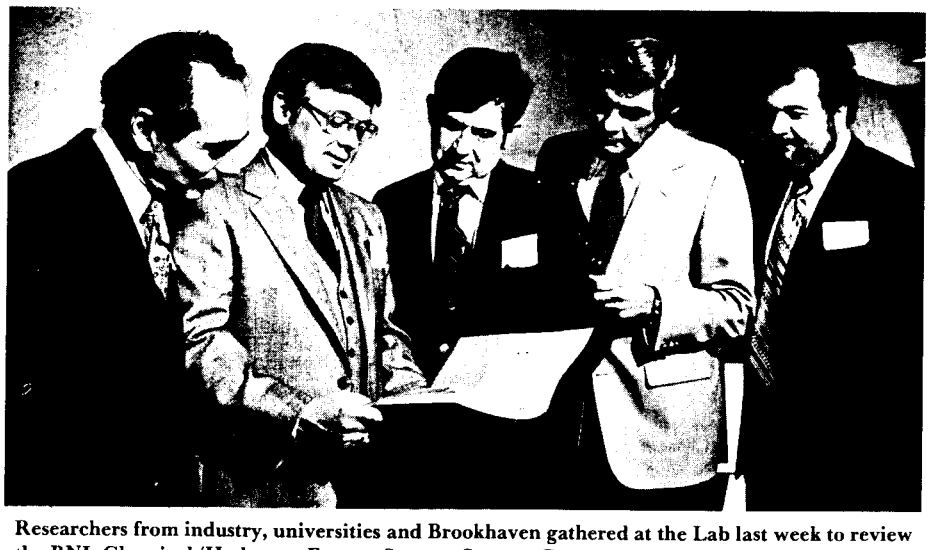
In January of 1975, Public Law 93-633 was passed which mandates that any company, or person, who packages or transports hazardous materials is obligated to comply with Department of Transportation (DOT) regulations, and can be held liable.

Hazardous materials are classified by DOT as poison, flammable liquid, compressed gas, magnetized material, oxidizer corrosive, flammable solid, explosive, radioactive, etiologic agent, and organic peroxide.

In order to assure proper labeling on packages, initial shippers are requested to exercise caution in filling out a shipping memo. It is also suggested that any additional information pertinent to the hazard of the material be included on the form. In this connection, care should be taken in the labeling of any item that contains magnetized material, particularly when it is to be shipped by air. It is understood that unlabeled "magnetized" packages have been known to interfere with aircraft instrumentation, thus posing a threat to the safety of the aircraft.

A Hazardous Materials Shipping Coordinator from S&EP reviews all shipping memos and recommends packaging and labels for hazardous materials. The Shipping Section of Supply & Materiel is responsible for labeling packages, placarding trucks and assuring that packing requirements are met. Initial shippers in doubt as to how their packages should be labeled, should contact the departmental S&EP representative, or Safety Coordinator.

Hydrogen Conference



Researchers from industry, universities and Brookhaven gathered at the Lab last week to review the BNL Chemical/Hydrogen Energy Storage Systems Program. BNL's Program Manager, Al Mezzina, along with DOE Division of Energy Storage, Office of Advanced Conservation Technology, conducted a review of technology projects, including Solid Polymer Electrolyzers and Chemical Heat Pumps. Hydrogen related research is being pursued by BNL and DOE to provide a safe, clean, environmentally acceptable and abundant fuel source to serve residential, commercial and industrial energy demands. Among the conference participants were (left to right) Frank Salzano, BNL; Cliff Frederickson, BNL; Robert Reeves, DOE; Al Mezzina, BNL; and Fred Gornick, University of Maryland.

—photo by Rosen

Grads Say Practical Ed. Works Best

They began their training in 1976 not quite sure if the sacrifices and demands of returning to school would be worthwhile, but upon their graduation from the Craft Apprenticeship Training Program, Joseph Buscemi, Joel Magee, and Cynthia Morgan all agree that it is.

The Craft Apprenticeship Training Program began in 1969 as a pilot program by Personnel to provide training for electrician and refrigeration and air conditioning trades. Since then the program has been expanded to include the machinist and carpentry trades.

Both Buscemi and Magee, who went into air conditioning and refrigeration technology, served in the armed forces and were accepted to the program through persistence and second effort. While Morgan, now an electrician, is also the first woman graduate.

The completion of their apprentice training entailed 18 credits of course work at SUNY Farmingdale and between 60 to 70, four-hour correspondence lessons given by the International Correspondence School, as well as on-the-job training.

"Without a doubt I think I learned more on the job," said Buscemi. Text books are set for ideal conditions and often you don't find those conditions in the field."

Magee agreed that the classroom is good for learning the basics, and added that his training will be going on until he retires. "You're always learning something new," he said. After he completes his apprentice courses, Magee wants to go on and get a B.S. in Professional Studies from Stony Brook. "My only regret is that I didn't do it 20 years ago," said Magee. "Right now, I'm having a race with my son to see who graduates first."

For Morgan, who received a B.S. in Science 18 years ago and taught eighth grade at one point, the hardest part of becoming an electrician was developing lost study habits. After working for more than a year as a secretary in the Fast Reactor Safety Division, she entered the program during March of 1976. Assigned to high voltage work on ISABELLE over at AGS, one of the few disadvantages she's encountered is her lack of strength.

"I often get many questions from women about what it's like being in the program, said Morgan, "and I say that it's hard work, but the feeling of accomplishment makes up for it."

All three of the graduates agree that putting classroom knowledge to practical use is the most important aspect of their training.

"It's a great opportunity to better yourself, and has to be taken seriously," said Buscemi, "but it's worth every bit of the four years of sacrifice."

—Jerry Mikorenda

Mort Rosen

Apprentice graduates (left to right) Joel Magee, Cindy Morgan, and Joe Buscemi, all feel their BNL on-the-job-training was the most important part of their four year apprenticeships.

Spiderwort Planting

Jerry Mikorenda

On Mother's Day a small group gathered outside BNL's west gate for a symbolic planting of a spiderwort or *Tradescantia*. The event, sponsored by the SHAD Alliance, was dubbed "bringing Spiderwort home" and was attended by about 40 people who were entertained by folk music and speeches on the public access land on William Floyd Parkway. The ceremony ended with children being led to the "conserve energy" sign and participating in the planting. According to Lloyd Schairer, who has worked with the plant for more than 20 years in the Biology Department, Sunday's planting doesn't have any scientific or experimental value in monitoring low levels of radiation.

Arrivals & Departures

Arrivals

Eric Bernholz.....Photo. & Graphic Arts
James . Faughnan.....Accelerator
Joseph M. Shpiz.....Accelerator
Denise G. Warren.....Photo. & Graphic Arts
Fred A. Wunder.....Photo. & Graphic Arts

Departures

Anna-Marie Cnops-Finocchiaro.....Physics
Thomas M. De Nobile.....Biology
Alessandro Fumagalli.....Chemistry

Noah Way

And the Lord said unto Noah: "Where is the ark which I have commanded thee to build?

And Noah said unto the Lord: "Verily, I have had three carpenters off ill. The gopher-wood supplier hath let me down – yea, even though the gopher-wood hath been on order for nigh upon 12 months. What can I do, O Lord?"

And God said unto Noah: "I want that ark finished after seven days and seven nights."

And Noah said: "It will be so." And it was not so. And the Lord said unto Noah: "What seemeth to be the trouble this time?"

And Noah said unto the Lord: "Mine subcontractor hath gone bankrupt. The pitch which Thou commandest me to put on the outside and on the inside of the ark hath not arrived. The plumber hath gone on strike. Shem, my son who helpeth me on the ark side of the business, hath formed a pop group with his brothers Ham and Japheth. Lord, I am undone."

And the Lord grew angry and said: "And what about the animals, the male and the female of every sort that I ordered to come unto thee to keep their seed alive upon the face of earth?"

And Noah said: "They have been delivered unto the wrong address but should arriveth on Friday."

And the Lord said: "How about the unicorns, and the fowls of the air by sevens?"

And Noah wrung his hands and wept, saying: "Lord, unicorns are a discontinued line; thou canst not get them for love nor money. And fowls of the air are sold only in half-dozens. Lord, Lord, Thou knowest how it is."

And the Lord in His wisdom said: "Noah, my son, I knowest. Why else dost thou think I have caused a flood to descend upon the earth?"

—Bill Hefner

—Reprinted with permission from Wooden-Boat magazine.

Reports Available

The following reports are now available to the Laboratory Staff and to Affiliates of the DOE, AUI, and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. Staff members should call Ext. 3484.

BNL 50934 **$4.50**
A Locational Analysis for the Petrochemical Industry. W. Isard and L. Parcels

BNL 50935 **$5.25**
Regional Pattern of Iron and Steel Production, 1985 and 2000. W. Isard and L.C. Parc

BNL 50936 **$8.00**
A Statistical Analysis of Regional Capital and Operating Costs for Electric Power Generation. L.R. Sanchez, et al

BNL 50973 **$6.50**
Annual Highlights of Programs in Energy Sciences. Department of Energy and Environment

NUREG/CR-0933
BNL-NUREG-51025
An Improvement in the Calculation of Turbulent Friction in Smooth Concentric Annuli. O.C. Jones, Jr. and J.C.M. Leung

BNL 51048 **$7.25**
Cementing of Geothermal Wells. Progress Report No. 12, January – March 1979. L.E. Kukacka, et al

BNL 51052 **$6.50**
Flash Hydropyrolysis of Coal. Quarterly Report No. 8, January 1 – March 31, 1979. M. Steinberg and P. Fallon

NUREG/CR-1006
NUREG-51054
Preliminary Design Study of a Large Scale Graphite Oxidation Loop. L.G. Epel, et al

BNL 51061 **$4.50**
A TRNSYS-Compatible Model of Ground-Coupled Storage. J.W. Andrews

BNL 51067 **$9.00**
Survey of Available Technology for the Improvement of Gas-Fired Residential Heating Equipment. Final Report. A.A. Putnam, et al

BNL 51069 **$7.25**
Biological Consequences of Environmental Changes Related to Coastal Upwelling: A Simulation Study. S.O. Howe

Service Awards

The following employees will receive service awards during the month of May.

Twenty-Five Years

Edwin T. Bailey.....Physics
Albert Geiger.....Central Shops
Dorothy G. Metz.....Staff Services

Twenty Years

Anthony R. DiPierro.....Plant Engrg.
Alfred P. Lewis.....Contr. & Proc.
John J. Loper.....Energy & Env.
Jose Soler.....Plant Engrg.
Arthur G. Worthington, Jr.....Plant Engrg.

Ten Years

Herbert J. Langenbach.....Physics
Alberta V. Parker.....Staff Services
Joan D. Perullo.....Staff Services
Laura A. Zaharatos.....Nuclear Energy

Blossoming Bulbs

Do not be in a hurry to remove the foliage from your flowering bulbs as soon as the flowers fade away. Wait until the leaves of daffodils, tulips, hyacinths and other flowering bulbs turn yellow and then brown, before removing them. They may look a bit untidy for a few weeks but these leaves are required to supply the essential foods necessary for next year's flowers.

On the other hand, flowers should be removed as soon as they fade to avoid seed formation. Seed development drains food from the plant that should be stored by the bulb for next year's growth.

Remember to leave the leaves on the plant until it dies, but remove the flowers as soon as they fade in color.

Cello-Piano Duo In Concert

On Friday, May 23, at 8:30 p.m. in Berkner Hall, BERA will sponsor a recital of cello and piano music by two young artists, Rebecca Rust and Jeffrey Marcus. The program will consist of Sonatas by Samuel Barber, Beethoven and Chopin.

Although this will be Miss Rust's first appearance at the Lab, Mr. Marcus has given solo recitals which were warmly received by enthusiastic audiences.

The Rust-Marcus duo was formed in 1970 when they met at the State University of New York at Stony Brook. Since then, they have performed many times in concert halls and on the radio in Europe, where they have been complimented in the press for their expert and sensitive muscianship.

After completing her studies with Bernard Greenhouse at Stony Brook, Rebecca Rust studied with Rostropovitch and continued studies in Germany, where she now lives with her German husband who is solo bassoonist of the Munich Philharmonic Orchestra. She plays an exceptinally fine 17th century Italian cello.

Jeffrey Marcus is a graduate of the Julliard School and SUNY at Stony Brook. He has toured extensively in Iceland and eastern Europe under the sponship of the U.S. State Department.

Admission is $2 for adults and $1 for persons under 18.

In Appreciation

We wish to express our appreciation to our son Tom's many friends and co-workers for their kind words and flowers during our recent bereavement.

—Jan and Anna Lesniak

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Published weekly
for the employees of
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Women In Science

The Women in Science Association will have a dinner meeting on Wednesday, May 28 at 5:00 p.m. in Room A of Berkner Hall. A hot buffet including wine will be served for $6.75. Payment for the dinner must be sent to Eena-Mai Franz, Bldg. 555A, no later than May 23.

Our guest speaker, Robert D'Angio, will talk on: "Personnel Policies and Programs." All members and nonmembers are invited to attend.

Yard Sale

The Brookhaven OXFAM Committee, dedicated to the goal of raising $5,000 to aid Cambodian refugees, is organizing a garage sale in Setauket on May 31 and June 1. Those people who can donate items to be sold at the sale, should call one of the following: Chip Balzer, Ext. 2256, or Bud Protter, Ext. 4423.

Selected Reading

J. Am. Med. Assoc. 243 (16), April 25, 1980
Cecil Coggins and the war in the shadows. E.G. Laforet. 1653-5

New Engl. J. Med. 302 (17), April 24, 1980
Hazards of a microwave oven. A. Perlman. 970-1

Runner's Corner

There is still a chance to register for the BNL Roadrunner's Spring Races, Sunday May 18 at Berkner Hall. Registration for the 5 km event ends at 9:00 a.m. with the race starting at 9:30. Registration for the 15 km race closes at 9:45 a.m. with a starting time of 10:15. Entry information can be obtained from bulletin boards in the gym locker rooms.

The annual Weeple Day Race (4.7 miles) will be run on Sunday, May 25, in Belle Terre Village, starting at 9 a.m. Registration on race day at Belle Terre Community Center, Cliff Rd., from 8-9 a.m., fee $1.00. All ages; male and female; also team races. For information call 473-2594.

Car Rental Memo

Avis currently rents cars to BNL employees at a flat rate, *or* a discounted time and mileage rate. Effective June 1, 1980, the flat rates will cease to be available. However, the discount on normal time and mileage rates will be 32%, and is available to BNL employees for either official or personal use.

An employee need only show his BNL Identification Card and know the "AID No. 298900" to obtain the discounted rates.

Softball

On the weekend of May 10 and 11, a softball team representing NSLS and BNL traveled to Jones Beach for a Class C Tournament.

Sparked by Jim Garrison and Leroy James, among others, they made a strong showing against teams from Nassau County. Finishing second, their only losses were to the eventual champions, the Heroes from Bethpage.

Congratulations to all members including Ken Asselta, Chuck Carlsen, Randy Church, Roy D'Alsace, John Flannigan, Jim Garrison, Leroy James, Dennis Klein, Ed Meier, Sr., Ed Meier, Jr., Rick Murgatroyd, Larry Musso, Wayne Rambo and Skip Thomas. A special thanks goes to Jim Kennedy who came down and really helped out offensively.

Lecture Reminder

Psychologist Beverly Birns from SUNY at Stony Brook will speak on "Women in Science, Why so Few? - A Psychological Perspective" on Monday, May 19. Part of the Women in Science Lecture Series, the lecture is at 3:30 p.m. in Berkner Hall.

A buffet will be served at 5:30 p.m. at the Brookhaven Center. Call the Cafeteria, Ext. 3541, for reservations.

Bicycling

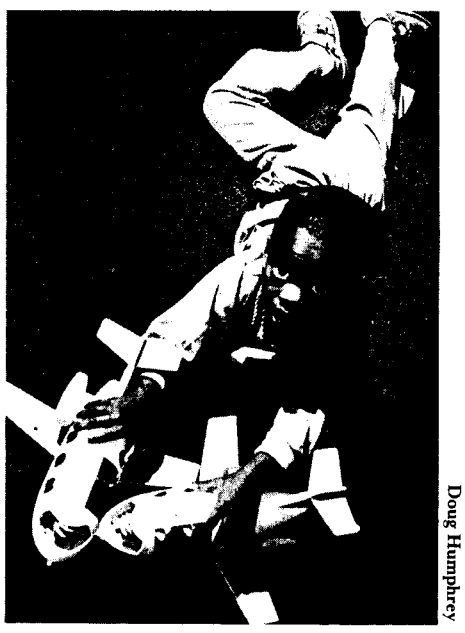
Coming up June 8 is the annual BNL Spring Race. As in last year's race, there will be two events, a single-lap, time trial around the lab exterior on public roads and a two-lap bunch start. A lap is about 16 miles. The two lap event will start at the North Gate on Wm. Floyd Parkway at 9:00 a.m. and the time trials at 9:10, with registration beginning at 8:15. The registration fee is $1.50 which pays for the soda and medallions. The time trial is open to all ages, but the bunch start event is for experienced riders. Protective headgear is required for all entrants in both events.

It is not too early to start planning for GEAR, the Great Eastern Rally, being held this year over the July 4th 3 day weekend with lodging at the State University at Geneseo, N.Y.

For information on any of the above, contact Gerry Morgan, Bldg. 815, ext. 4841.

For High-Flying Kids

The Upton Nursery School is ready to take-off again. It is a coperative, non-profit school open to the children of Lab employees and visitors. Classes for three and four year old children are held mornings in the Recreation Building. Information about the school and enrollment for this coming year is available at the cafeteria, bank, and recreation hall. Carpools are also available from the north shore and south shore. For more information contact enrollment officer Kassie Ruth at 744-2444, Elaine Lowenstein at 286-2788, or Judy Wanderer at 744-1112.



Doug Humphrey

Mt. Club Calendar

Memorial Day Weekend – Hiking/camping at Mount Washington. For more information call Don David, Ext. 3942.

June 10 – Meeting to plan future activities at 7:30 p.m. in North Room of Center.

June 20 to 22 – Annual canoeing trip on Delaware River.

Contact Anita Swoboda at Ext. 2968 for more information.

Cafeteria Menu

Week Ending May 23, 1980

Monday, May 19		
Potato leak soup	(cup)	.45
	(bowl)	.55
Roast turkey & stuffing w/cranberry sauce & 1 veg.		1.50
Western omelet & 1 veg.		1.35
Hot Deli – Roast beef	(bread)	1.45
	(on roll)	1.55
Tuesday, May 20		
Split pea soup	(cup)	.40
	(bowl)	.50
Chinese pepper steak		1.45
Poached filet & 1 veg.		1.45
Hot Deli – Pastrami	(bread)	1.45
	(roll)	1.55
Wednesday, May 21		
Cream of spinach soup	(cup)	.45
	(bowl)	.55
Stuffed pepper w/spaghetti		1.45
Pork butt steak w/mushroom sauce & noodles		1.50
Hot Deli – Special 8 foot hero		.70 per inch
Thursday, May 22		
Beef barley soup	(cup)	.40
	(bowl)	.50
Meat cakes & buttered noodles		1.40
Scalloped ham & potatoes		1:35
Hot Deli – Edith's chile	(bread)	1.40
	(roll)	1.50
Friday, May 23		
Fish chowder	(cup)	.45
	(bowl)	.55
Barbequed spare ribs & 1 veg.		1.50
Breaded flounder filet & fries		1.45
Hot Deli – Turkey breast stroller		1.50

Bowling

Pink League

The "PINSPLITTERS" are the Pink League Champions. Congratulations to Ellie Adams, Maria Apelskog, Renie Rosati, Marge Stoeckel, Captain, and Joyce Nichols who helped them out on playoff night.

Highlights: Marie Grahn's 181, Marge Stoeckel's 168/483 series, Joyce Nicholsen's 156, Sharon Creveling's 155 and Helen Keeley's pickup of the 6-7-10 split (twice).

See you all next year.

Red League

The 76'ers won the Red League Playoff 8-3. J. Petro beat the Sandbaggers with a 266 game, 635-710 series. For the losers, R. Meier 203, had a 643 gross series and E. Meier a 213 game.

Gold League

High games for the evening were: Chris Bortscheller 179, and 173, Marie Susa 163, Kay Hunt 160, Claudia Tyler 158, and Marsha Kipperman with a 159, 167, 175/503 series.

Attention Bowlers

The Bowling Board has learned that alleys will be available at the Wildwood Lanes in Riverhead for next season. If you are interested in bowling there, please contact Dick Larsen, Ext. 3464; Betty Jellett, Ext. 3639, or Helen Keeley, Ext. 4649.

Applications for next season will be available at the Awards Party. They will also be sent to League Secretaries and Team Captains. Priority for last year's teams ends *June 30, 1980.*

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.

The determination of the best-qualified candidate for available positions will be based upon education, experience and other job-related criteria. Such factors will be evaluated and measured against the demonstrable requirements of the available vacancy, as well as the Laboratory's Affirmative Action objectives.

The Laboratory is committed to a policy of Equal Opportunity in its selection and placement of personnel. Its objective is equality of opportunity in employment, training, and promotion without regard to race, color, religion, national origin, sex, age or handicap.

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.

LABORATORY RECRUITMENT: Opportunity, for present Laboratory employees.

1337. MESSENGER - Staff Services Division.

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

1338. SECRETARIAL (temporary – 6 months) - Requires excellent secretarial, communication and language skills. Will primarily be responsible for processing typewritten reports using AM-Text word processing equipment. Will also be expected to carry out routine functions i.e. completing travel arrangements, preparing a variety of BNL forms, filing, and answering phones. Safety & Environmental Protection Division.

1339. SECRETARIAL (temporary – 2 months) - Requires excellent secretarial skills, especially typing ability, familiarity with word processing systems (Daconics or Micom) is desirable. Will join central office staff and assist with the processing of scientific/technical reports. Department of Nuclear Energy.

1340. GEOCHEMISTRY ASSOCIATE - Requires BS/MS in chemical oceanography or marine sciences or equivalent experience with laboratory and field procedures used to examine geochemical phenomena. Will work with low level waste management group studying geochemical processes controlling the behavior of trace elements in sediment water systems as applied to migration of radionuclides at shallow land burial sites. Department of Nuclear Energy.

1341. CHEMISTRY ASSOCIATE - Requires BS or equivalent in chemistry/biology with some experience in radiochemical analysis. Knowledge of instrumental methods of analysis and radiation counting equipment is desirable. Will join waste management group and work with low level radioactive materials. Department of Nuclear Energy.

1342. PHYSICS ASSOCIATE - Requires BS/MS in physics or equivalent knowledge of nuclear structure physics. Experience in review and analysis of literature on nuclear transformations is highly desirable. Will work with National Nuclear Data Center staff providing general assistance as well as scanning literature for reference to nuclear structure data. Department of Nuclear Energy.

1343. DEVELOPMENT ENGINEER - Requires BS/MS or equivalent in mechanical engineering with several years experience in experimental testing of thermal systems, with emphasis on HVAC. Will work under the direction of senior researcher, designing and carrying out R & D experiments on use of solar energy in the heating and cooling of buildings. Department of Energy & Environment.

Autos & Auto Supplies

71 CHEVY MALIBU - sm V8, reg gas, 65,000 orig mi, runs well, needs cosmetic work. Ext. 4309.

73 DODGE WGN - 82K mi, very good. $550 or best offer. 473-8716.

RANGER CAP - for pickup, insulated, int light, jalousies, slider, boat rack. Asking $350. Kurt, Ext. 4698, after 5:30, 744-2097.

73 PONTIAC FIREBIRD - ps/pb, a/t, dk green, good cond. $2100. 928-8522.

74 DODGE DART - sport model, a/c, a/t, ps/pb, 315-V8, good cond. $1100. Bob, Ext. 3370.

68 CHEVY II NOVA - 6 cyl, a/t, $200; GMC 4-spd truck trans, $50; 69 VW Squareback parts, best offer; heavyduty roof rack, fits GMC Carryall, custom made, best offer. 928-5031.

MOTORCYCLE - 78 Honda Cafe Racer, 100% chrome 2 modified engs, $6000 invested. Best offer over $4500. 928-0158 after 6.

67 DODGE DART - new batt, a/t. $250. Kale, Ext. 4224.

73 DODGE MAXI-VAN - good running cond, some rust. $1600. 475-3415 after 6.

Classified Advertisements

Autos & Auto Supplies (Cont'd)

CAMPER CAP - Ranger steped, insulated, paneled, 8', excel. $275. Erno, Ext. 2012.

72 MUSTANG - 60,000 mi, V8, a/t, ps/pb, a/c, good cond. $1200. Ext. 4636.

72 TOYOTA LANDCRUISER - mech perf but rusty body. $1800. Cyrus, Ext. 2012.

71 CHRYSLER NEW YORKER - radials, a/c, ps/pb, p/w, green/green vinyl roof, excel cond. $1450. Jim, Ext. 4040, 289-0876.

76 GRENADA - excel cond, std trans, 24-28 mpg, economical. $2550. Lou, Ext. 4615.

75 PONTIAC FIREBIRD - 350 eng, 2 bbl carb, r/h, ps/pb, a/c, AM/FM-8trk, brown/brown, excel cond. Robert, 475-2058.

73 CHEVY BLAZER - std drive, good mech cond, rust, much repaired. $950. 751-0833 after 6.

HONDA MOPED - excel cond. $375. Sue, 924-8215.

75 HONDA - 750cc, blue, excel cond, extra chrome, custom seat & truck. Best offer or $1495. 399-4761.

73 HONDA - 70 byc auto, 1300 mi, like new. $350. 234-7225.

60 MERCEDES DIESEL - running cond, 4 spd, new clutch. $400. Dick, 283-4360.

TIRES - (5) GR78-15 Goodyear steel belted radials. Ext. 3392, 475-8330.

15" RIMS - 3/$10. Ext. 2616.

72 INTL SCOUT II - 4x4, excel cond, 60,000 mi, 5 snows, 5 reg tires. $2500. Bill, Ext. 4173, 929-3029.

76 BUICK SPECIAL - V6, ps/pb, AM/FM. Madeline, Ext. 3487.

70 CORVETTE - 350/300, T-top, a/t, a/c, ps/pb, p/w, AM/FM, low mi, new tires/brakes/exhaust, like new. 744-2404.

TIRES - (2) H78-15 glass belted, 5000 mi. $25. Al, Ext. 7588.

67 CHEVY BISCAYNE - 6 cyl, new batt/muff/eng pipe, reb carb, new snows, high mi, runs well. $250. Ext. 2321.

70 DATSUN CONV - mint. Mary 744-3909 weekends.

71 CHEVY SUBURBAN - 4 w/d, std, locking hubs, good cond, ps/pb, h.d. hitch. $1200. 698-9055 after 6.

79 FORD VAN - E150, many extras, excel cond. $6250. Eddie, 581-9707, 924-7677.

78 HARLEY DAVIDSON - 250cc, dual purpose. $800. Nick, 399-2244.

VINYL CAR TOP - for MG Midget, slight tear. $40. Henry, Ext. 2534.

69 TROTWOOD TRAILER - 17', self-cond, excel cond, sleeps 6, canopy, TV ant, sp tire. $1800. Tony, 929-6314.

76 CHEVY CONCOURS - 4 dr, 6 cyl, a/c, p/s, r/d, AM/FM-8trk, 38K, excel, leaving country, must sell. Ext. 4410, 924-0581.

HONDA 360CL - windshield, crash bar, rack, new tire, 50 mpg, excel $795. Levine, Ext. 7102, 878-1124.

TIRE - w/rim for Fiat, 165SR13 radial, good tread. $15. 289-6038.

TIRES - (2) F78-15 w/w, $5 ea; (2) D78-14 w/w, $5 ea. 363-6597.

69 CHEVELLE - 6 cyl, 3 spd, 4 dr, good cond. $600. JoAnn, Ext. 4189, 588-8492 after 6.

TIRES - (2) Dunlop w/chrome slotted wheels, F70-14, rsd white letters, like new. $160. Bob, 289-0413.

79 GMC JIMMY - a/t, sm 306, 4 w/d, blue. 654-8204.

55 STUDEBAKER - runs, needs some body work, must sell. Best offer over $500. 732-3073 after 5.

79 TRANSAM - 6.6 4 spd, loaded. $8850. 724-1340 after 6.

74 LESABRE LUXUS CONV - a/t, full pwr, AM/FM, a/c, rear defrost, mags. Best offer. Ext. 4113, 289-0753.

77 CAMARO - ps/pb, p/w, a/c, AM/FM stereo, 305-V8, excel cond. Pat, Ext. 4173.

76 GRENADA - excel cond, std trans, 24-28 mpg, economical. $2550. Lou, Ext. 4615.

8' TRUCK CAMPER - 76 Honey slide-on, self-cont, jacks & extras, like new. 744-8332 after 6.

73 TORINO - 4 dr, a/c, AM radio, ps/pb, good cond, vinyl top, tires good, high mi. $650. Tom, Ext. 2863.

AM/FM STEREO - Audiovox, for 74-76 Buick, 2 yrs old w/mount. $50. Bill, Ext. 2906.

HAND PUMP - for fuel drum, $30; new 350 Chevy head, compl, $25. Ext. 3082, 12-12:30; 286-1886.

Boats & Marine Supplies

CLAM BOAT - 16' Garvey, fiberglass bottom, 1975-40 hp elec start Mercury w/full controls. $1050. Ext. 4309.

BOAT TRAILER - tandem wheels, 18-20' boat, needs some work. $250. Bob, Ext. 4672, 929-4753.

19' RENKIN CRUISER - 1978, all canvas, I/O, galv trailer, low hrs. $4800. 286-0626.

SUPER SUNFISH SAIL - mast, boom, very good cond. $150. Ext. 2012.

CLAMBOAT - 24'x8', glassed hull & deck, oar r.r., self-bail cockpit, 1975-70 hp Evinrude, excel cond. 586-8431.

OUTBOARD MOTOR OIL - unopened, 5 gal drum Merc 50:1 Quick Silver. $35. Ext. 3848.

8' HYDROPLANE - fast, no motor, excel. $150 or best offer. Rolf, Ext. 4939.

7' FIBERGLASS DINGHY - excel cond, w/oars. $125. P. Fallon, Ext. 3043, 878-2266.

15' STARCRAFT RUNABOUT - 33 hp Evinrude elec start, trailer, extras. $450. Andy, Ext. 3514, 286-8814 after 6.

17' HERMANN CATBOAT - Witholz design, fiberglass, Perkin inboard eng, s/s radio, other extras, excel cond. $6700. Ext. 4069, 261-7825.

20' PLYWOOD CRUISER - 1954, 40 hp Evinrude 1965, navy top, cushions. $300. Dave, 475-7891 after 5.

WOOD IS GOOD - 20' camper/cruiser w/80 hp Johnson, equipped to sleep 4+. $1000. 286-0880.

SM BOAT BOARDING LADDER - $10. R. Wieser, Ext. 3080.

115 HP EVINRUDE - excel cond, low hrs. $700. Bob, Ext. 3309.

15' WOODEN RUNABOUT - new decking, outside just repainted, eng controls & steering, good cond. $175. 281-0360.

17' ALUM CANOE - Grumman grand. $200. Gene, Ext. 3519, 541-2657.

16' LONE STAR - fiberglass runabout, h.d. tilt trailer, both good cond. $800. Jim, Ext. 4502.

Yard Sales

SHOREHAM - Harvard & Valentine off North Country, May 17, community yard sale – many families. Marty, 744-8632.

BELLPORT - 86 Bieselin Rd, Sat May 17, 10-4, rain date Sun May 18.

PORT JEFF STA - 8 Hickory St (off Canal), May 17-18, 10-5, tools, housewares, clothing, etc.

STONY BROOK - 63 Cedar St, May 17-18.

CENTER MORICHES - Ocean Ave, free coffee & donuts before 9 a.m. Carol, Ext. 4173.

Miscellaneous

MEDIT BEDRM - dbl bed, triple dresser w/mirror, armoir, 2 nite stands. $425. 878-4984.

DESK - executive steel case, wood top, tan & chrome bottom, locking 6 drawers, like new. $150. 286-0077.

AIR COND - Emerson Quiet Kool, fresh air feature, 3 degrees of cooling, 18,000 BTU, 220v, 13 amps. Make us an offer we can't refuse. Tom, Ext. 7115, 744-5801.

LESLIE ORGAN SPKR - Model 120 for all organs, w/cables & controls. $100. Dick, Ext. 3273.

REFRIG - 6 mos old, frost free, avocado, 16 cu ft. JU8-1713.

BARBEQUE GRILL - gas operated, incl tank, $35; Andersen gliding window, 26"x62¾", $60. 473-4471.

PATIO DOOR - w/screen. $25. Sue. 286-0407.

SKIS - 170cm Rossignol "Grand Prix" w/Tyrolia 150 bindings, $100; Nordica ski boots, size 11½, $20. Dave, 286-3235.

MARTIN GUITAR - 00-18C model, excel cond, w/case, must sell, good for beginner. $300 firm. 821-0137.

STEREO RCVR - AM/FM 4-channel multi-function, 3 yrs old, like new. $125. Richie, Ext. 4254, 734-7342 after 6.

2 DEEP FRYERS - restaurant equip, $100 both; toaster, $10; leaf mulcher, 5 hp, $225; 60" colony round table, 2 leaves, $25. Diane, 878-4984.

36" SNOW THROWER - attachment for Gravely. 363-7032.

COLOR TV - Magnavox 24" console. $250. A. Park, Ext. 2023, 234-0311.

VACUUM - sm, almost new. $20. 744-9498 after 7.

BIKE - 20" boy's, working nicely. $10. Ext. 3845.

ENGLISH IVY RUNNERS - 20/30' for ground cover, easy instruction, will consider any swap. Ext. 4035.

GOLF CLUBS - used set, irons 3-PW, woods 1,3,5, faultless, Lee Trevino model. $60. Frank, Ext. 4122.

ANIMAL SHELTER - suitable for rabbits or chickens, 4'x4'x8'. $35. 581-7656.

GE AIR COND - 8500 BTU, $100; 50' tower, 10' sections, heavy galv, $150. 286-3377 after 6.

TV - b/w wood console, $15; umbrella type clothes line, $5. Bill, Ext. 2906, 929-6189.

RECLINER CHAIR - $10. 727-5912.

PUPPIES - AKC reg Doberman, blk, good disposition & line, have parents at home. 727-7185.

SLIDE PROJECTOR - for 35mm slides, manual advance, $20; Bauer T-4 movie projector, 8mm film, $50. Charlie, Ext. 4227.

OIL BURNER - Metal Master, good cond. $35. Ext. 4636.

KEMP SHREDDER - 4 hp, like brand new. $200. Stan, Ext. 3284, 286-1062.

GOLF CLUBS - Pro Line Wilson, staff irons 2-PW L4NX irons 3-9 SW B. Vogt, Ext. 4241.

STEREO SYSTEM - Sony deluxe, excel cond, $180; Singer zig zag sewing machine w/buttonholer, $35. Ext. 2386, 924-3072.

MUSIC BOOKS - new assortment, brand new, 50% off published price. R. Hildenbrand, Ext. 3273.

GIRL'S SLACKS - polyester, 6 prs, size 14, elastic waist, spring colors, never worn. $1.25/pr. 878-2239.

COLLECTORS ITEMS - wooden orange crates, bottled gas tanks, hand push mowers, rotisserie motors, grindstone. 744-3069.

TENNIS RACQUETS - used Jack Kramer 4⅝, $21; 4⅝ Bancroft, $10; 4½ Spalding alum, $18; all strung. Alice, Ext. 3293, 878-0717.

WOOD SCREENS - (2) 28"x43", (3) 36"x43", $5 ea. Bill, Ext. 3355, 472-4684 after 6.

SEARS TRACTOR-MOWER - 8 hp, 36", good cond. $300. Sonny, 727-4925.

WIRE LOBSTER TRAPS - $18 ea; swimming pool, 4'x24', filter, new cover, $375. 587-3952 after 6.

MACKISSICK SHREDDER CHIPPER - 5 hp Briggs eng, excel cond. $300. 286-3377 after 6.

SNARE DRUM - w/carrying case & floor stand. Ext. 4058, 878-0462.

25" COLOR TV - console, needs tubes. $45. A. Romano, Ext. 4024.

END TABLES - 2 glass & chrome, excel. $35 takes both. Maria, 924-3756.

MINK COAT - full length, brand new, won in contest. $1800. Ext. 4661 or 363-6572.

CANNONBALL BED - & chest; Spanish style desk & chair; Victorian side chair; maple din set, 48" round formica (wood) table. Ext. 4853, 751-4958 after 6.

DIN RM SET - solid maple w/hutch, mint; heavy Bennington pine 42" round table w/1 leaf. 727-0505.

WATER PUMP - ½ shallow well, excel cond. $50. Stan, Ext. 3284, 286-1062.

HAMMOND ORGAN - 9500 series, auto rhythm, upper & lower keyboard, built-in cassette, excel cond. $900. 286-0077.

LAWN MOWERS - good cond, must be seen. Call Joe, 475-8440 evenings.

LIVING RM SET - 80" contemp counch, end tables, 2 lamps, chair, stereo – Scott turntable, Sherwood components. Complete or separate pieces. Call 475-4082.

STOVE - airtight Gibraltar #3, almost new, w/glass front. Cost $500, now $350, cash & carry. 588-0805.

CAMERA - movie, hand held Yashica, 8mm film, super-40K, about 8 yrs old. $45. Charlie, Ext. 4227.

MATTRESS & BOXSPRING - full, super firm, quilted, 1 yr old, excel, $85; frame, $5; hutch, $35; dining table w/4 chairs, $30. Ext. 2386 or 924-3072.

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

BELLPORT VILLAGE - 3 bedrm high ranch, L/R, fam rm, lg eik, deck, 1½ baths. $42,000. 286-8166 after 5 & weekends.

MT. SINAI - 3 bedrm ranch, cathedral ceiling L/R w/fp, w/w, 5 appl, 2 baths, gar, willing to rent also, $425/mo if renter is willing to show house to buyers. $35,000. Bill, Ext. 3369.

MASTIC BEACH - 3 bedrm ranch, corner lot, roofed patio, pleasant loc near water. Low 30's. 281-7531.

MIDDLE ISLAND - 4 yr old custom-built barn-shaped colonial, cedar siding, on 1½ acres (½ acre spring fed pond, giant blk walnut trees), 3 bedrms, full bsmt, 2 mi from Lab, acre-zoned area, energy-saving home. $69,000. 924-7480 after 5.

WADING RIVER - N of 25A, property for sale, exclusive area, lovely wooded building plot, slightly under 2 acres. Owner asking $20,000. 928-0158, no brokers.

CENTER MORICHES - L-ranch, 3 yrs, 7 rms, fp & wood stove, bsmt, w/w, a/c, D/W, ref, dbl oven, newly decor, fenced yard, pool, landscaped, s/s, near beach & marina, 8½% mtg. $48,000. 878-4984.

CENTRAL ISLIP NORTH - 1 acre, hi-ranch, 8 rms, 1½ baths, 24x28 sunken patio, possible M/D, many extras. Yani, Ext. 2514, 265-0536.

SHOREHAM VILLAGE - charming older home, furn, 5-6 bedrms, L/R w/fp, D/R, eik, fin bsmt, 2-car gar, patio, porch, ¾ acre, walk to tennis & beach. $70,000. 744-9720.

BELLPORT VILLAGE - Dutch colonial, 4 bedrms, 1½ baths, city water, gas heat, patio, garden, fruit trees, playhouse, on 1 beautiful acre, walk to shops, golf, tennis, beach, ferry. 286-2320.

LAKE GROVE VILLAGE - 2 fam 3 bedrm ranch, LR/DR, eik, oak flooring w/w, 5 appl, deck, treed, landscaped, tool shed, gas heat, low taxes. $38,500. Ext. 3800, 467-1763.

MANORVILLE - 3 bedrm ranch, 1 acre, 32' country kit, cathedral ceiling, 1½ baths, appl, bsmt, gar, assumable mtg at negotiable rate. $45,000. Pete, Ext. 3868/4574, 878-1225.

SOUTH SHIRLEY - 3 bedrms (possible 4th), 1 full + 2 half baths, L/R, D/R, eik, den w/fp & woodburning stove, bsmt, 2-car gar, many extras, 7 mi from BNL. $37,000. 281-0804 eves.

E. PATCHOGUE SO. - unique home, 2 lg bedrms, lg closets, storage, den, L/R, din area, kit, 1½ baths, fp, att gar, new alum siding & roof, fenced yard, garden area, corner ¼ acre. $39,000. Ext. 3082, 286-1886.

BELLPORT - 3 bedrms, 2 baths, L/R, D/R, kit, 2 fp, lg den on lower level, gar, located on prvt road near bay. 286-2251.

For Rent

SHIRLEY - 3½ rm apt, all util incl, 6 mo lease. $250. Rick, Ext. 4113, 399-6307.

HAMPTON BAYS - summer rental, 5/23-9/3, 2 bedrm apt, 2 mi from ocean, ½ mi to Bay. 728-2104, 9-11 p.m.

SHOREHAM - 3 bedrm house, compl furn, near beach, for rent July-Aug. Ext. 7747, 744-3481.

PORT JEFF STA - 3 bedrm house, avail June 1. $350/mo + util. 928-5374.

MIDDLE ISLAND - 6 mi from Lab, condom townhouse, 3 bedrms, 2 baths, 5 appl, use of club house, swimming pool, tennis court. Franny, Ext. 4337, 744-3235 eves.

BELLPORT - 8 rm house, 4 bedrms, 2 baths, att 2-car gar, fully furn, 1yr beginning Sept 1, 1980. $400/mo. Ext. 4368, 286-1489 eves & weekends.

BELLPORT - 1 bedrm, 2nd floor, unfurn apt, private ent, garage, utilities incl. Lease $295/mo. 286-8850.

Wanted

ANYONE INTERESTED - in going on 1-day shopping spree to Reading, Pa, June 21. For info call Marie, Ext. 3673.

OLD VOLKS - 1965-1968, for parts, any cond. Larry, 751-2149.

3 OR MORE BEDRM HOUSE - w/bsmt, S. Huntington/Melville area. Bill, Ext. 7688.

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

VARIOUS PARTS - for 76 Audi, batt, pump, etc; also parts for 62 Chevy, 2 dr. 585-5870.

EXERCISE BICYCLE - good cond. Joe, 4255, 289-1831.

OLD SWIMMING POOL LINERS - for ecology project, will pick up liners. E. Jochen, Ext. 3357.

HOMES - for 3 cats, 2 males blk, b/w; female tiger, neutered. 475-5834.

2 SPKRS - for AM/FM tuner, reasonable, wanted by student. Geo, Ext. 4612.

TRENCH - 400' long, 24" deep, for elec service. John, Ext. 2070, 728-1201.

PHOTOGRAPHER - to do wedding Sept 27, I will provide film, free dinner for 2. Rolf, Ext. 4939.

OAK DRESSER - good cond, at a reasonable price. Ext. 3689, 286-8490 nights.

POLAROID CAMERA - b/w, will buy. 744-9746 eves, Ext. 3570.

READER - for visually handicapped computer programmer. Will be paid. Prefer those with some computer knowledge. Ext. 7995.

RADIAL ARM OR TABLE SAW - good cond. Ken, Ext. 3574, 472-3329.

SET OF WEIGHTS - for beginner weight trainer. Greg, 698-9739 after 6.

UNFURN APT OR HOUSE - 1 or 2 bedrms, near BNL. Ext. 2841.

2-3 BEDRM HOUSE - within 15 mi of BNL. Pradip, Ext. 2671.

TRUNK - in good cond. Julie, Ext. 3070.

BICYCLE - men's 26" std bike. Ext. 4846, 363-6940 after 5.

MOTORCYCLES - bent or broken, any age or cond. Kevin, 281-8031.

HOUSE - Pt Jefferson, Setauket, Stony Brook, quiet area, 3-4 bedrms, D/R, eik, bsmt, $50,000-$65,000, lg down payment. Jim, Ext. 3501, 928-6491 eves.

EXPERT HOUSESITTING - free, Lab vicinity, after June 1. Jack, Ext. 2059.

GOLF BALLS - used, unmarked, name brand. George, Ext. 4612.

Car Pools

ELMONT AREA - or along Southern State, join or form car pool. Al, Ext. 2072.

STONY BROOK/STRATHMORE - driver wanted for existing car pool, 8:30-5:00. Morris, Ext. 7146.

STONY BROOK/STRATHMORE - want to join or form car pool. Jon, Ext. 4682.

HAUPPAUGE - 8:30-5:00, looking to form 2-member car pool or paying rider. Gene, Ext. 2416.

SELDEN - 8:30-5:00, would like to join car pool as a paying rider. Ext. 3827, 732-3875 eves.

LIE EXIT 39 - Glen Cove Rd, car pool wanted. M. Schnader, Ext. 2068.

LAKE GROVE AREA - want to join or form car pool. Walter, Ext. 3800.

STONY BROOK - 3 summer students need daily rides from campus. Can pay $30/wk. Ext. 3766.

Lost & Found

LOST - engagement ring, vicinity of baseball fields #1 & #2, 5/7/80 afternoon, much sentimental value. Reward. Linda, Ext. 3168.

LOST - softball glove, model #HUTCH, Field 3. Call Ext. 3198.

Services

AUTO REFINISHING - all areas of work performed, discount rates for sm car refinishing. Ext. 2546, 744-4047.

VAN POOL - from Miller Place to BNL. Don, Ext. 3284.

ASPHALT PAVING & SEALING - Bob, 475-4382.

BABYSITTING - nights only, experienced, reliable, live in Wading River, love children. Gina, 929-4753 after 3.

CARPETS INSTALLED - & repaired, quick, dependable service, free estimates. Jim, 821-0187.

TIRES - new & used, repairs. F. Usack, Ext. 4798 lunchtime.

FRESH CLAMS - $1.50/doz. Ken, Ext. 3354, 654-2831.

TUTORING - all sciences by experienced biochemist, get ready for June Regents & finals. Babette, Ext. 3419.

EXPERT HOUSE SITTING - after June 1, Lab vicinity, any duration, free. Jack, Ext. 2059.

TYPING - scientific reports & general typing, reasonable rates, 24 hr service. 289-3994.

BABYSITTING - M-F in my home, 4 min to Lab, Ridge area. Marie, 744-4047.

Ads left out of this issue due to lack of space need not be re-submitted to appear in next week's issue. Please note that ads may not be more than 15 words long and must be received in the Bulletin office by 4:30 p.m. Friday, for inclusion in the following week's Bulletin.

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

BROOKHAVEN BULLETIN
Volume 34 - Number 20 / May 16, 1980
BROOKHAVEN NATIONAL LABORATORY

The AGS - A Look Back

By Martin Plotkin

In the beginning there was the "COSMOTRON." But, alas, its energy was too low. Then the Doyens of Physics, sitting on high in their lofty aeries and ivory towers proclaimed that there should be put on this earth a new device, of HIGH ENERGY. Thus, they beseeched the GODS in Washington and, in somewhat more than six days, the AGS came to pass. Unfortunately, life and nature are not always cooperative and a lot more work, planning, frustration and disappointment was necessary before the AGS became an operating machine.

The paper describing the alternating gradient principle, by Courant, Livingston and Snyder, was an outgrowth of work done to improve the Cosmotron performance. Although it promised very high energy performance at modest cost, it also raised some fundamental questions about the stability of the beam when passing through a part of the accelerating cycle called "phase transition." Other possible questions had been raised about the ability of such a machine to work properly.

To answer some of these questions a "hurry-up" machine, the electron analogue, was built. This was a unique device, employing electric fields instead of the conventional magnetic fields always used to bend and focus the beams in a circular accelerator. It included an rf system with phase feedback, pickup electrodes and all the other hardware required for a conventional accelerator.

The analogue required extremely high precision mechanical alignment, high vacuum in a large volume and some unusual procedures to demagnetize the electric field lens components. After demagnetization in one building the lenses were hand carried for installation to the "test shack" where the analogue was being constructed. To prevent remagnetization by the earth's field, the person doing the carrying kept spinning around while walking, probably resulting in questions about the sanity of the Accelerator Department.

The "test shack" was a temporary building used during Cosmotron construction. It was broiling in the summer, frigid in the winter and was not too soundly built, but it withstood many hurricanes. The analogue supports rested directly on the floor, which was not very substantial. This led to many problems and at one point a whole month was spent, after the machine stopped working, until it was determined that the test shack floor had settled a few thousandths of an inch due to the vibration from earth moving machines nearby.

But the machine worked! And it worked well. It enabled us to proceed with the AGS design and construction knowing some of the fundamental concepts were sound. To show the importance of our results we can compare the AGS to the 7 GeV machine which was under construction in Moscow, at about the same time. The Russians were worried about phase transition and designed their machine to avoid it. The result was a massive magnet not well suited to physics research.

Right after the analogue went through phase transition successfully, Dr. Veksler, the Russian co-inventor of the synchrotron principle, visited BNL and the test shack with an embassy official and an interpreter. In this Stalin era there was much closer control of Soviet scientists and the embassy official resembled the James Bond version of a Soviet secret agent. Ken Green explained to Veksler about our success in going through phase transition. This was translated into Russian and Veksler was quite excited. He asked the same question. again in Russian. He then asked it in German and Green answered in German. Veksler, who spoke English too, finally asked the question directly in English just to make sure he understood this crucial point.

The final resting place of the analogue is not known. It was shipped to Oak Ridge National Laboratory and, recently, unsuccessful attempts were made to locate any portion of it for the Smithsonian Institution exhibit on accelerators.

The Cosmotron had a unique name, and, for a while, there were names suggested for the AGS. Early in the design, when a final energy had not been selected, the name AGNES was proposed. This was an acronym for Alternating Gradient, Nebulous Energy, Synchrotron. Cooler heads prevailed, however, and AGS it remains to this day.

It is hard to describe the sense of accomplishment which you feel when a large complex structure, such as an accelerator, becomes a working device. It starts out as a lot of bits and pieces, simple mechanical brackets to large electronic devices. These gradually merge to form an entity which, in retrospect, is awesome. I had a feeling of unreality when looking back at the Cosmotron after several years at the AGS. Did we really build that complex monster? Did it really work? In a similar way the AGS is unbelievable. The beautiful picture which emerges upon completion of a jigsaw puzzle is comprised of many odd-shaped, vari-colored pieces, each without a separate identity.

A new phase is now beginning. The AGS is to be merged with the next generation accelerator, ISABELLE. The complexity of the ISA dwarfs that of the Cosmotron or the AGS, in size and intricacy as well as in energy. But, there will be a successful marriage of the two machines and the physics progeny of the union will continue to keep BNL in the forefront of high energy physics research.

Ernest Courant

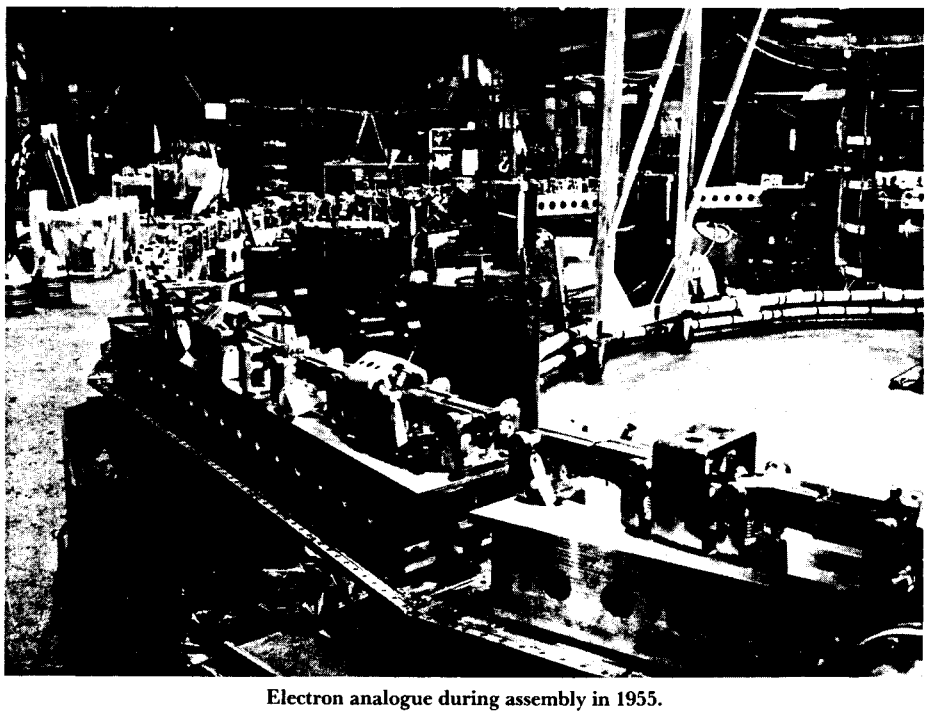
AGS 20

—logo by Per Dahl

The high energy physics community will celebrate the 20th anniversary of the Alternating Gradient Synchrotron (AGS) at Brookhaven on May 22. The day's program will include an afternoon of talks on the history of, and some of the achievements at the AGS. Speakers will include Nobel Laureate Sam Ting, Val Fitch of Princeton, Kjell Johnsen of CERN, and Melvin Schwartz of Stanford, plus BNL physicists John Blewett, Ernest Courant and Nicholas Samios. The discoveries made at the AGS - CP violation, two types of neutrinos, the J/psi and other new particlees and resonances - have contributed greatly to the advancement of high energy physics. There is much cause for celebration.

Leland Haworth, former Lab Director, with model of AGS magnet at dedication ceremonies in 1961.

In the control room on the first day of operation of the electron analogue are from left, Julie Spiro, N.C. Christofilos, Marty Plotkin, Hartland Snyder, Ken Green and Gene Raka.



Electron analogue during assembly in 1955.

Samuel Ting and the MIT/BNL group which discovered the J/psi particle in November 1974. In the foreground is a graphic representation of the event.

John Blewett

(From left), Rudy Damm, Julie Spiro and Ken Batchelor at 200 MeV Linac, on first day of operation in November 1970.

AGS Milestones

Summer 1952
Concept of strong focusing principle.

December 1955
Beam in electron analogue accelerated to 5 MeV.

January 1956
Digging started for circular trench to house magnet tunnel.

May 17. 1960
50 MeV proton beam injected into synchrotron and successfully completed one turn.

May 26, 1960
Beam injected into synchrotron and successfully spiraled around ring approximately 100 times without r-f acceleration.

July 22, 1960
First attempts of appreciable acceleration resulted in occasional pulses to phase transition at a few BeV.

July 29, 1960
Beam consistently passed through phase transition and was accelerated to above 30 BeV.

June 1963
80″ Chamber in operation.

February 1964
Omega-minus particle discovered.

January 1966
AEC includes $45.8 million in budget for AGS conversion.

March 1968
Slow external beam in operation.

November 1969
Seven foot Chamber in operation.

November 1970
Start-up of the 200 MeV Linac.

October 1973
8° superconducting magnet starts operation in the new fast external beam.

November 1974
Discovery of J/ψ particle by experiment 598 (MIT/BNL).

December 1974
Start of first physics experiment with the Multiparticle Spectrometer.

October 1977
Start of HEUB superconduting magnets operations for physics experiments.

October 1978
ISABELLE ground breaking.

April 1979
Start of AGS slow extracted external beam switchyard construction.

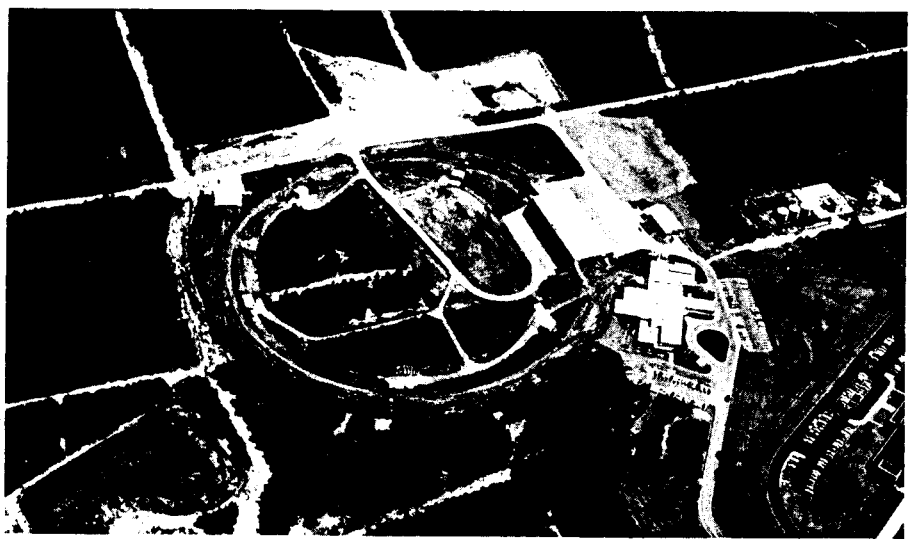
January 1980
Cessation of seven foot Bubble Chamber operations.

February 1980
Start of AGS slow extracted external beam operations with new switchyard.

Renata Chasman

Ralph Kassner

Day one - operation of the AGS Conversion 200 MeV Linac.



1960 - Aerial view of the AGS

1980 - Artist's concept of the ISABELLE site