

1978 In Review

The scientific departments and divisions of the Laboratory were asked to give a brief summary of the highlights of their work during the past year. In the following mini-report it was not possible to include an account of the vital support of the other technical and administrative groups of the Laboratory. But without their dedication, the diversity and quality of Brookhaven's research would be impossible.

ISABELLE

It was a very busy year for the ISABELLE staff, beginning in January when ISABELLE received Presidential approval. President Carter's budget for Fiscal Year 1979 contained a request for full authorization of the \$275 million project and \$23 million in funds for the first year of construction.

On January 13, Lab Director George Vineyard announced the official formation of the ISABELLE Project and named James Sanford as its head. The project was then organized into five divisions: Machine, Experimental areas, Detector, Facilities, and Administrative.

The Department of Energy's Chicago Operations Office established the ISABELLE Project Office at BNL and named Vern Witherill as DOE Project Manager.

Planning and design work continued, and the next few months saw the completion and issuing of the ISABELLE Management Plan, Conventional Facilities Design Final Report Title I (Amman & Whitney), and Final Environmental Impact Statement for ISABELLE.

An ISABELLE Summer Workshop was held at the Lab from July 17 through July 28. Over 80 visiting scientists attended the interactive session, which proved to be a successful forum for the exchange of information between prospective users and members of the Project.

Meanwhile, the design of all machine components continued at an increased pace, and detailed design of the conventional facilities was authorized. Testing of industry produced superconducting magnets was given high priority and this program achieved a significant milestone when the MK-XIV magnet exceeded 50 kG.

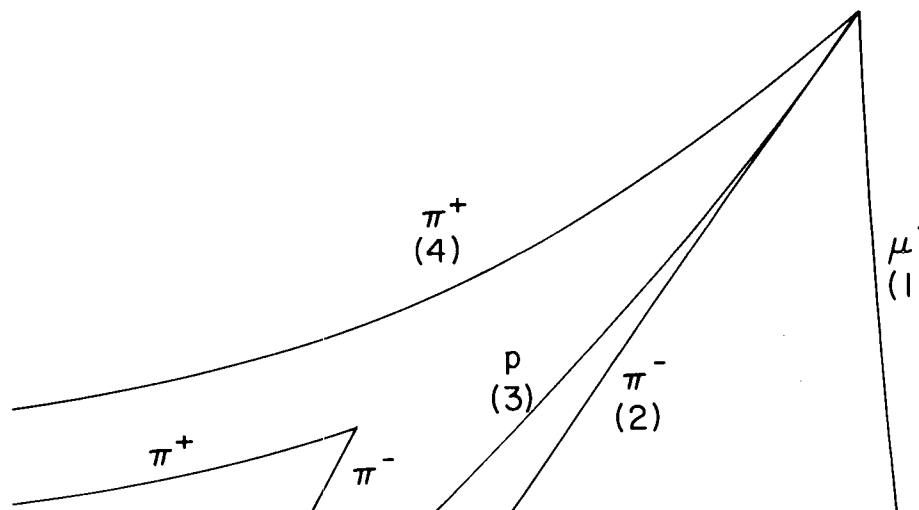
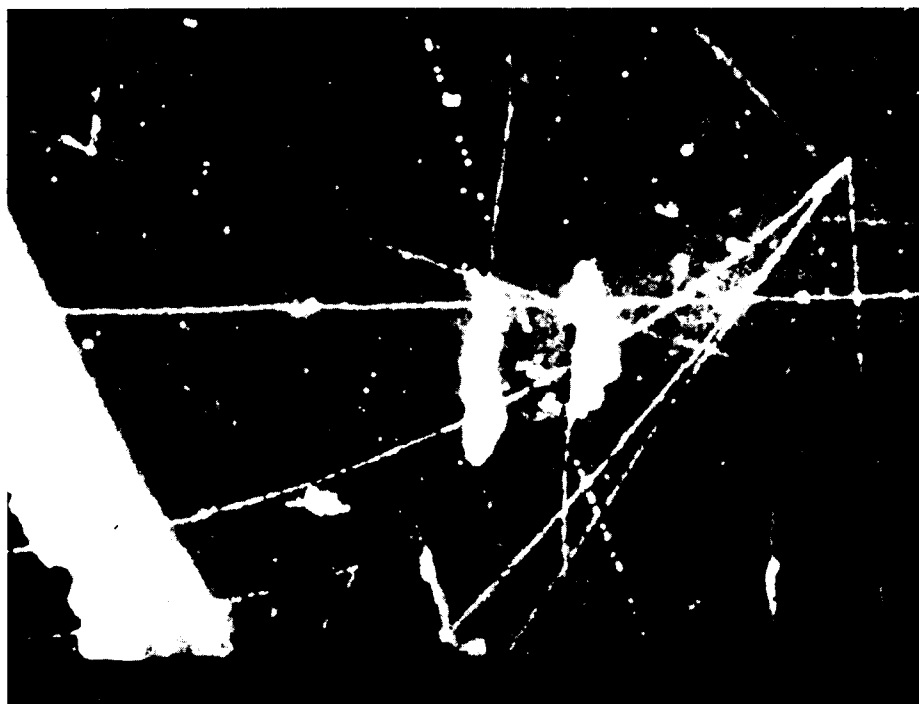
On October 27, a groundbreaking cere-

mony was held at the ISABELLE site to mark the initiation of construction. Principal speakers at the occasion were Lab Director George Vineyard; Congressmen Jerome Ambro and John Wydler; Under Secretary of Energy Dale Myers; AUI President Gerald Tape; Michael Zeller, representing HEDG; William Wallenmeyer, Director of DOE's Division of High Energy Physics; and ISABELLE Project Head James Sanford.

Fiscal Year 1979 began on a positive note, when the Project was notified that the \$23 million in ISABELLE construction funds had been authorized and appropriated.

Physics High Energy

A second example of the production of a charmed baryon has been identified in an experiment utilizing the BNL 7-foot bubble chamber. One half million pictures were required in order to obtain these two events. The new event is interpreted as an interaction between a neutrino of energy 3.9 GeV (unseen in the bubble chamber) and a neutron which is a constituent of the deuterium target in the bubble chamber. The resultant products of the collision are a μ^- meson and the $\Lambda_c^+(2260)$ charmed baryon which is not directly observed but is seen to decay into a proton, positive pion, negative pion and a neutral kaon. The neutral kaon is observed to decay some distance from the event into a positive and a negative pion. Observation of this event has important consequences toward confirming current theories which predict the existence of new types of quarks, which are now regarded to be the principal constituents of hadronic matter.



A view of the charm event as seen from one of the three bubble chamber cameras.

Nuclear Physics

When high-energy heavy ions fuse with a target nucleus, large amounts of energy and angular momentum are deposited in the compound system. In the rare earth region, this compound system eliminates considerable energy but relatively little angular momentum by neutron evaporation. The excited residual nucleus must eliminate most of the large input angular momentum by γ -ray emission. It is through study of such γ -ray emission that one can learn how nuclear matter responds to large centrifugal stresses and to the Coriolis forces associated with high spin. Changes in nuclear shape, and in the way angular momentum and excitation energy are accommodated by the nucleus, are expected to occur. The underlying shell structure is most strikingly demonstrated in nuclei than are near major shell closures. Recently, in an experiment at the Tandem, BNL scientists studied γ rays from discrete nuclear states, with angular momentum up to about $36 \hbar$, at over 12.5 MeV excitation, in the nucleus ^{154}Er . The character of such states (are they to be described in terms of aligned shell model orbitals, or in terms of collective excitations involving many particles?) can only be decided by further experiments.

Solid State Physics

Magnetism And Superconductivity

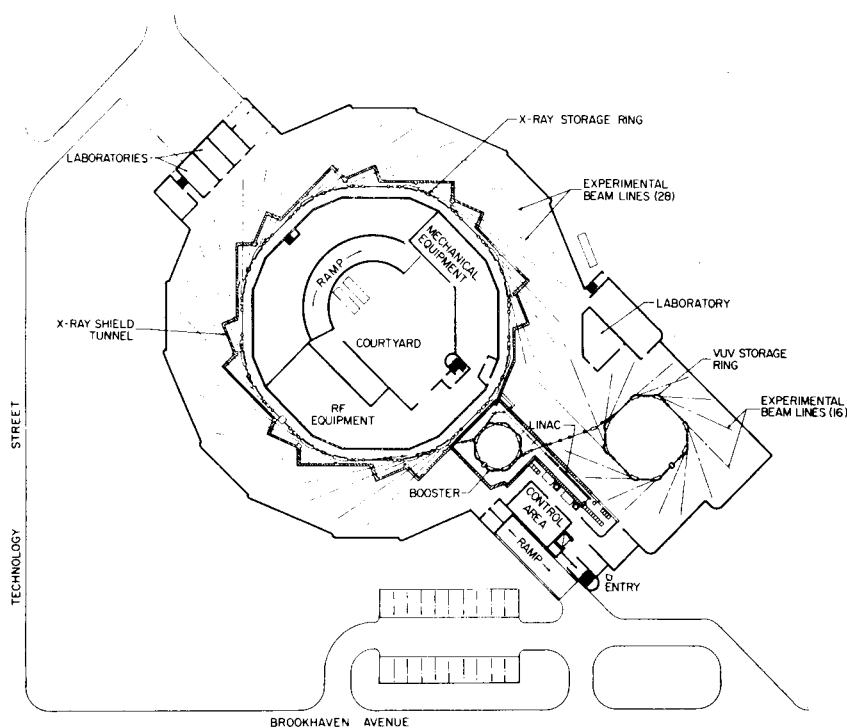
Because magnetic impurities typically suppress superconductivity in metals, it has long been supposed that an ordered magnetic state could not coexist with the superconducting state. Recent neutron scattering experiments at Brookhaven have shown this assumption is incorrect. These studies, coupled with other experiments are leading to a much clearer understanding of the interaction between these two competing types of order.

Neutron diffraction studies at Brookhaven have confirmed the antiferromagnetic ordering in the superconducting state of DyMo_6S_8 and TbMo_6S_8 . The superconducting state for these coexistent magnetic superconductors is not destroyed by complete antiferromagnetic ordering of the rare earth magnetic moments. However, the stability of the superconducting state (as measured by the magnitude of the external field necessary to destroy superconductivity) is reduced at the onset of magnetic ordering. The neutron data also show that the application of a weak external magnetic field

(continued on page 2)



At the Brookhaven Center before the ISABELLE groundbreaking ceremonies on October 27 were (from left) Dr. Vineyard, Congressman Otis G. Pike, Congressman Jerome A. Ambro, Under Secretary of Energy Dale D. Myers and Congressman John W. Wydler.



Plan of the first floor of the National Synchrotron Light Source.

National Synchrotron Light Source

The NSLS is in its second year of a four year construction program. Most visible so far have been the activities at the building site at the corner of Brookhaven Avenue and Technology Street. Thanks to favorable fall and early winter weather, progress has been excellent. The expectation is that that part of the building which will house the Vacuum Ultra Violet storage ring will be occupied by June 1979. Completion of the balance of the structure is expected by May 1980.

The construction of machine components has kept pace with the building. The linear accelerator, made of components from the Cambridge Electron Accelerator and the Nuclear Research Institute in Amsterdam, has been reconditioned and the associated linac-to-booster beam transport has been built. Beam tests are expected before year end (1978). Many of the principal elements of the VUV storage ring are now under construction, such as VUV magnets, vacuum chamber, rf, and diagnostic components. Also, delivery of the central computer facility is expected next January. Concurrent with these activities has been the detailed design of the booster injector synchrotron and certain elements of the X-ray storage ring. Also, progress has been made in the design of the synchrotron radiation "beam" lines which exit from both electron storage rings.

Much work was done during the past year, much remains to be done. However, given the present momentum and enthusiasm of the project staff, synchrotron light may be expected to be emanating from the NSLS storage rings by the second half of 1981.

Applied Mathematics

The Applied Mathematics Department serves the dual role of conducting research in the mathematical sciences and providing computing service to the Laboratory.

The mathematics and computer sciences research consists of three major thrusts: applied analysis and computational mathematics, statistics and operations research, and the study of local and global computer

networks. In addition, there have been activities in support of a medical records system developed for the Department of Health, Education and Welfare, a data-link for the exchange of meteorology information between BNL and the National Weather Service, and a compilation of energy-related computer models and data bases for a central DOE repository at Oak Ridge.

In the computer service area, extensive efforts have been made to improve the rotating mass storage, telecommunications, and tape handling capabilities of the Central Scientific Computing Facility. New attention has been given to the support of graphics, data management, and mathematical libraries. An ambitious program of performance measurement and analysis was organized to help improve the effectiveness of the computing center.

Nuclear Energy

During its first year the department has concentrated on strengthening its areas of special competence while exploring possible new directions.

One new concept being actively encouraged by the Department of Energy is that of a fast mixed-spectrum reactor (FMSR). This reactor concept has distinct advantages in the areas of non-proliferation and increased utilization of uranium resources. With an FMSR the need for both enrichment and reprocessing while in steady use would be eliminated, since the reactor would use only natural or depleted uranium as feed, and a once-through-and store fuel cycle.

Among the established programs in which important goals were achieved were the Super System Code (SSC) development and the thermal-hydraulic experimental program. After completion on schedule a year ago of SSC-L, a 60,000 statement code simulating the thermal-hydraulic response of any loop-type liquid metal fast breeder reactor (LMFBR), work is well advanced on SSC-P, a corresponding code for pool-type LMFBRs. In September, the Thermal Hydraulics Development Division commissioned a large new heat transfer facility which will provide the Nuclear Regulatory Commission with data to aid in analysis of hypothetical accidents in commercial light water reactors.

Accelerator

The past year in the Accelerator Department was notable for the continued increase in performance and reliability of the AGS with an attendant increase in physics output, advances in accelerator related technologies relevant to energy production and transmission, and the initiation of the ISABELLE Project.

A new AGS peak intensity record of 1.117×10^{13} proton/pulse was set and 6.9×10^{19} protons were accelerated, a 23 percent increase over last year. Several new modes of operation were introduced to meet the demands of the experimental program, including the extraction of beams of 5 GeV/c and 1.5 GeV/c protons which made possible high sensitivity searches for exotic six-quark states and for evidence of neutrino oscillations respectively. The new Low Energy Separated Beam II, providing the highest fluxes of low energy kaons and antiprotons in the world, was brought into operation. The hypernuclear spectrometer which yields momentum resolution approaching one part in 10^4 produced data for the first round of experiments. The 7-foot Bubble Chamber took 1.2 million pictures during the last cooldown setting a world's record for large bubble chambers.

Nearly twenty experiments with more than thirty university groups in addition to BNL experimenters took high energy physics data. In addition, the Linac beam was used in a parasitic mode for medical isotope production and nuclear chemistry.

Power Transmission

The objective of a major program within the Division of Advanced Technology Applications is to develop an underground superconducting power transmission system which is economical and technically attractive to the utility industry. The system would be capable of carrying very large blocks of electric power thus enabling it to supplant overhead lines in urban and suburban areas and regions of natural beauty. Also being developed is polymeric tape insulation which will enable conventional pipe-type cables to carry more power.

A superconducting cable 10 m long was tested in the laboratory. These tests will lead to the design of a 100 m cable which will be operated at an outdoor test facility now under construction. The 100 m cable is designed for use in a 138 kV, 1000 megawatt system.

A cable taping machine was operated during 1978. With this machine experimental cables of a prototype nature can be wound. A polymeric tape of polyethylene

was made under subcontract which possessed an exceptionally high tensile modulus, a requirement of a tape for electrical insulation. This is the first time high-modulus polyethylene has been made in a tape form.

High Flux Beam Reactor

The 60 Megawatt Conversion Project will increase the power of the High Flux Beam Reactor from 40 MW to 60 MW. The resulting 50% increase in neutron beam intensity will save time or allow increased scope on research programs being conducted at the reactor.

The project consists of three basic parts, installing larger primary heat exchangers, improving the reactor afterheat removal capability and upgrading the secondary water system. During 1978, progress was made in all three areas. First, the new primary heat exchangers were designed by the vendor and the design approved by the BNL Reactor Division and an independent consultant. Purchasing of materials for the new units got well underway and fabrication started. Second, a pony motor system to extend the coastdown of the primary pumps for afterheat removal was designed, substantially installed and tested. Third, a new secondary water pump was added and overhaul of the existing secondary water pumps started. In addition, upgrade of the secondary water cooling towers started with the installation of new fan stacks.

Physics

(Cont'd)

induces a substantial ferromagnetic component. Thus, in these weak fields, both ferromagnetic and antiferromagnetic order occur with the sample in the superconducting state.

A second type of behavior has been demonstrated in ErRh_4B_4 and HoMo_6S_8 . These materials also order magnetically below their superconducting transition temperatures. However, they order ferromagnetically in zero applied field as determined by neutron diffraction. In these materials development of the magnetic order ultimately destroys the superconducting state. In the ErRh_4B_4 there appears to be a narrow temperature range over which the magnetic order parameter and the superconducting order parameter are simultaneously nonzero. Preliminary neutron scattering experiments have begun to clarify the dynamic nature of the interaction of these two competing order parameters.



Last summer a delegation of accelerator specialists from the Peoples Republic of China spent some time at the Laboratory becoming acquainted with our accelerator research and development. They will form the nucleus of the team that will build China's first high energy accelerator.

Energy & Environment

Significant progress has been made in the Department of Energy and Environment in all its major areas of endeavor. In the energy sciences area, work on porphyrins, the indispensable catalyst in the conversion of light into chemical fuels, has led to the suggestion that light induced processes in plant photosynthesis consist of charge separation into oxidized chlorophylls and reduced chlorophylls or pheophytins.

Superconducting tapes of Nb_3Sn and laminated biaxially oriented plastic dielectric tapes of high modulus have been produced that meet the specifications of the BNL AC power transmission cable project.

Processes developed for making polyketones or polysulphones by combining sulphur dioxide or carbon monoxide with ethylene show promise in reducing the use of oil in the production of plastics.

The environmental programs led to a successful Coastal Boundary Layer Transport (COBOLT) study of the near shore water circulation, temperature, and salinity. Experiments were done at 16 locations



Haze layer over the L.I. area photographed during a MAP3S flight. The haze is caused by photochemical reactions of gaseous materials generated by cars, chemical and power plants, etc.

during March, May and August of '78 and represent the first high resolution analysis of water movement in the near shore coastal zone. These results were used to model deposition of sludge, oil spills, etc. on the south shore of Long Island. In the Multi-State Power Production Pollution Study (MAP3S) ground level particulate sampling in the Greater New York subregion confirmed the theoretically anticipated regional sulphate levels which were correlated with meteorological variables. In the acid rain program the data from a sequential precipitation collector indicate that the highest acidity in precipitation is found in squall-line and cold-front weather patterns during the summer months.

Several advances were made in the energy technology area. A unified mechanism has been proposed which is capable of explaining and predicting metal and metal oxide catalyst behavior for the energetically important carbon oxide reduction reactions used in coal liquefaction.

Work on fuel cells, which produce electricity directly from the reaction of hydrogen and oxygen, and on water electrolysis processes for the production of hydrogen

has led to finding better electrocatalysts for hydrogen, oxygen and chlorine production as well as the gaining of an understanding of the mechanisms of the sintering of the catalysts in fuel cells.

At the request of the Office of Energy Research and Industrial Conservation Division of DOE, DEE conducted a very successful Workshop at Reston, Virginia on Research for the 21st Century Technology. The workshop was attended by representatives of the largest corporations in the U.S. and professors from major universities. A consensus was reached on the need for a Federal role in support of advanced applied research on industrial processes to reduce energy consumption and improve productivity.

A number of energy-saving retrofit options were tested in the oil-fired space heat facility.

A combination of analytical approaches has been used in the National Center for Analysis of Energy Systems to analyze and represent the complex interactions between the nation's energy and economic system.

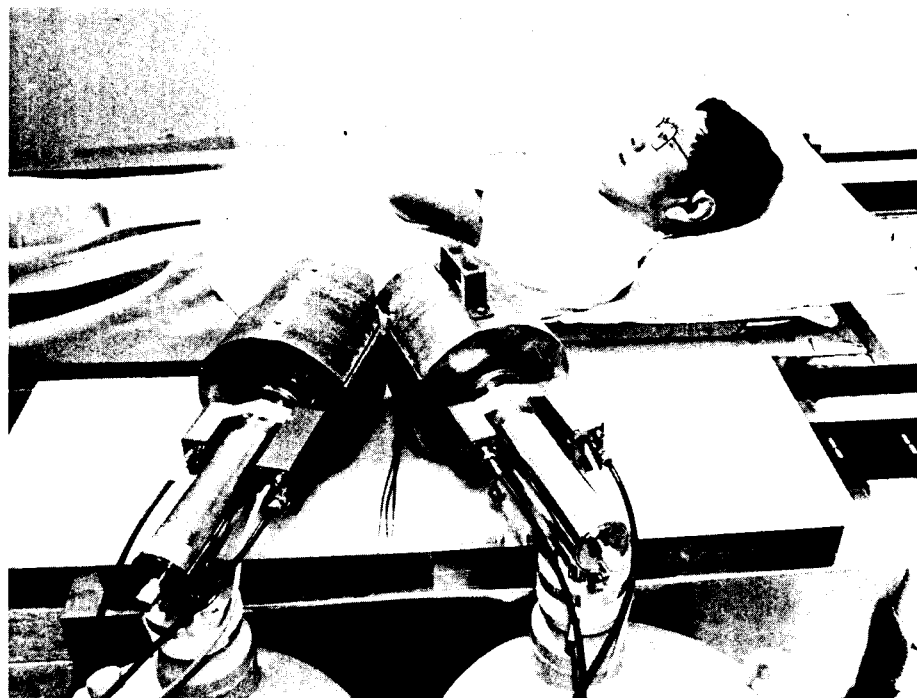
A regionalized Buildings Energy Conservation Optimization Model (BECOM) which explicitly models the U.S. buildings stock, and alternatives for reducing energy consumption, has been used to evaluate impacts of the National Energy Plan.

An assessment of the health consequences to the public of increased coal usage was part of Brookhaven's lead role in the DOE intralaboratory National Coal Assessment project. Also, the potential health effects of an increase in the level of indoor air pollution resulting from a decreased air infiltration rate was evaluated in order to establish appropriate conservation policies.

A major study entitled Energy Needs, Uses, and Resources in Developing Countries was completed for the U.S. Agency for International Development. A major long-term energy market allocation model (MARKAL) has been developed for DOE and the International Energy Agency (IEA), through a collaborative effort between Brookhaven and Kernforschungsanlage-Juelich involving participants from many IEA member nations.

Chemistry

The Chemistry Department had an active and successful year in 1978. Highlights include the recognition of the startling results of BNL's solar neutrino experiment by two major awards for Ray Davis and funding to initiate the second massive experiment, this one eventually requiring 50 tons of gallium. Programs using lasers to study and initiate chemical reactions were marked by the first direct measurements at the Laboratory of photochemical processes occurring on the picosecond time scale (10^{-12} sec). Measurement of electron exchanging reactions between xenon ions and atoms, needed for development of heavy ion fusion reactors were successful as was the application of both x-ray and neutron diffraction methods to determine the electronic charge density between atoms in crystals, providing direct pictures of chemical bonds. Finally the development of radiopharmaceuticals labeled with short-lived positron emitters and their use in humans to quantitatively measure brain metabolism has already stimulated great interest in the use of this technique to study many aspects of brain function and disease.



The new mobile medical unit will contain a prompt gamma ray analysis facility similar to this one. The two detectors in the foreground count the gamma rays given off by the cadmium in the subject's left kidney.

Medical

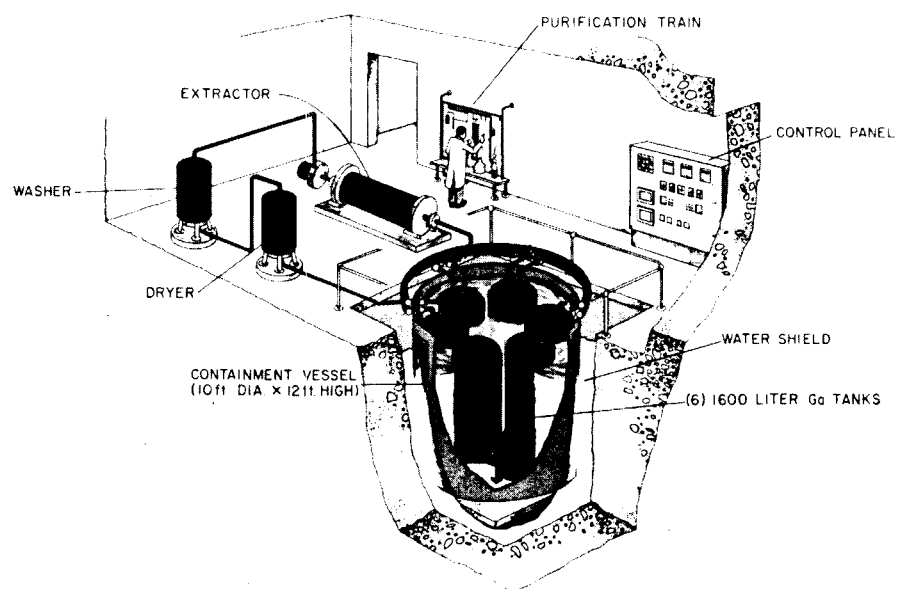
1978 saw the virtual completion of construction of the Inhalation Toxicology Laboratory. It is expected that occupancy of this building addition which enables exposure of animals to hazardous and particulate materials will take place in the latter part of January. This facility comprises one portion of the Medical Department's new program in the study of pulmonary diseases. Clinical studies in this area of research, directed toward improvement of diagnostic tests, prevention of pulmonary disease, and new modes of therapy were also initiated during 1978. In related efforts health effects of exposure to benzene, now a gasoline additive, were studied using mice in controlled inhalation chambers. Development of leukemia, and quantitation of antibody response and related immune mechanisms are biological endpoints used in the investigation.

The Nuclear Medicine Research Group in collaboration with the Chemistry Department and scientists of the University of

Pennsylvania began studies of brain metabolism in health and disease using positron-emitting fluorine-18-deoxyglucose and detection with the PETT III (positron-emission transaxial tomograph). This instrument is also used for myocardial imaging and assessment of myocardial perfusion.

Cadmium in liver and kidney has been determined in normal volunteers and in subjects with pulmonary disease and hypertension. A portable unit was completed in 1978 which will enable Medical Department scientists to use this prompt-gamma *in vivo* activation technique in various occupational groups throughout the country. Another prompt-gamma technique put into operation this past year was the determination of total body nitrogen. This determination will be used in studies of diet, nutrition and cancer in collaboration with Long Island Jewish Medical Center.

We look forward to increased studies of pulmonary disease in 1979, and full operation of the new Inhalation Toxicology Facility.



Proposed solar neutrino experiment using 50 tons of gallium as the detector. This experiment will be carried out deep underground to eliminate background effects.

Safety & Environmental Protection

A Marshall Islands field trip demonstrated that dose equivalent commitments for several persons living at Bikini had exceeded radiation protection standards for members of the general public. This unexpected finding, while unlikely to cause observable health effects resulted in the Department of the Interior moving the Bikinians away from their home a second time.

Are magnetic fields mutagenic? To date results indicate no detectable mutagenic effects in *Tradescantia* and *Drosophila* from fields as large as four tesla administered for several days.

The Radiological Research Accelerator Facility was acquired by the Division to be operated as a national resource providing facilities for studies in radiobiology. Recent experiments with diatomic molecules and single atom projectiles have again shown the importance of spatial energy distribution in producing a biological effect.

A low cost radioiodine monitor was developed to measure releases following a low probability power reactor accident. This system is unique because of portability, lack of interference from noble gases and efficiency for collection of a variety of chemical species in which iodine may be present.

Training programs have expanded to include cardio-pulmonary resuscitation, respirator use, health physics for power plant personnel, health physics certification review, fork truck and crane safety, and supervisor safety responsibilities. In addition, a variety of audio-visual materials concerned with industrial safety topics has been collected and made available for Laboratory-wide use.

Waste management operations have been improved with the acquisition of an incinerator, a compactor and new type radioactive waste transportation packages.



Rare-earth oxide spheres 100 microns in diameter reveal a wealth of microstructural detail to Instrumentation's new scanning electron microscope. The right-hand image shows an enlarged view of the central sphere at 20,000X with a resolution of 50 angstroms.

Instrumentation

Significant advances have been in further understanding of the ionization loss of relativistic particles, of the spatial distribution of avalanche, and of the signal formation in gas proportional detectors. The results of this work will be used in detectors for research at ISABELLE, the High Flux Beam Reactor, and the National Synchrotron Light Source. Further advances have been made in the development of two-dimensional position-sensitive detectors for thermal neutrons. Two detectors built so far have been used extensively at the HFBR for determination of molecular structures in biological research. The experiment control and data acquisition system developed for the neutron detectors is an example of a number of such systems completed recently or under development for other applications. The controllable environmental data acquisition telemetry system for oceanographic research was used very successfully employing four buoys in an experiment last summer.

The Electron Microscopy Laboratory has been greatly improved by the acquisition of an AMR 1000A scanning electron microscope and an energy dispersive x-ray

analyzer. This is a powerful analytical system which provides high resolution microscopy with the capability to detect all elements of atomic number 11 or higher in amounts as small as 10^{-14} g.

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BROOKHAVEN BULLETIN

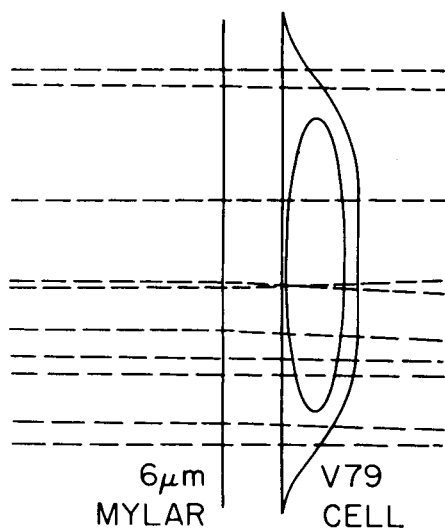
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BERNICE PETERSEN, Editor
ANNE BAITTINGER, Staff Writer
ROSANNE PAGANO, Editorial Assistant

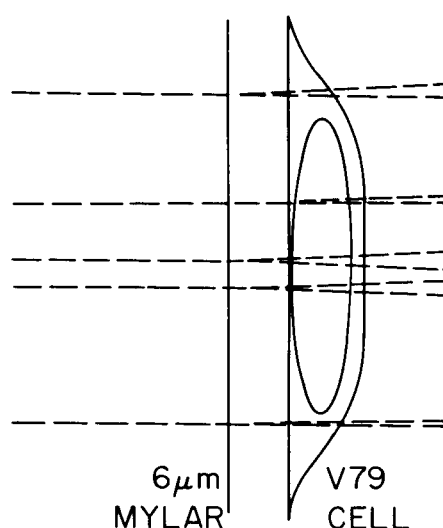
40 Brookhaven Ave., Upton, N.Y. 11973
Telephone (516) 345-2345

CARL R. THIEN, Public Relations Officer

SINGLE IONS



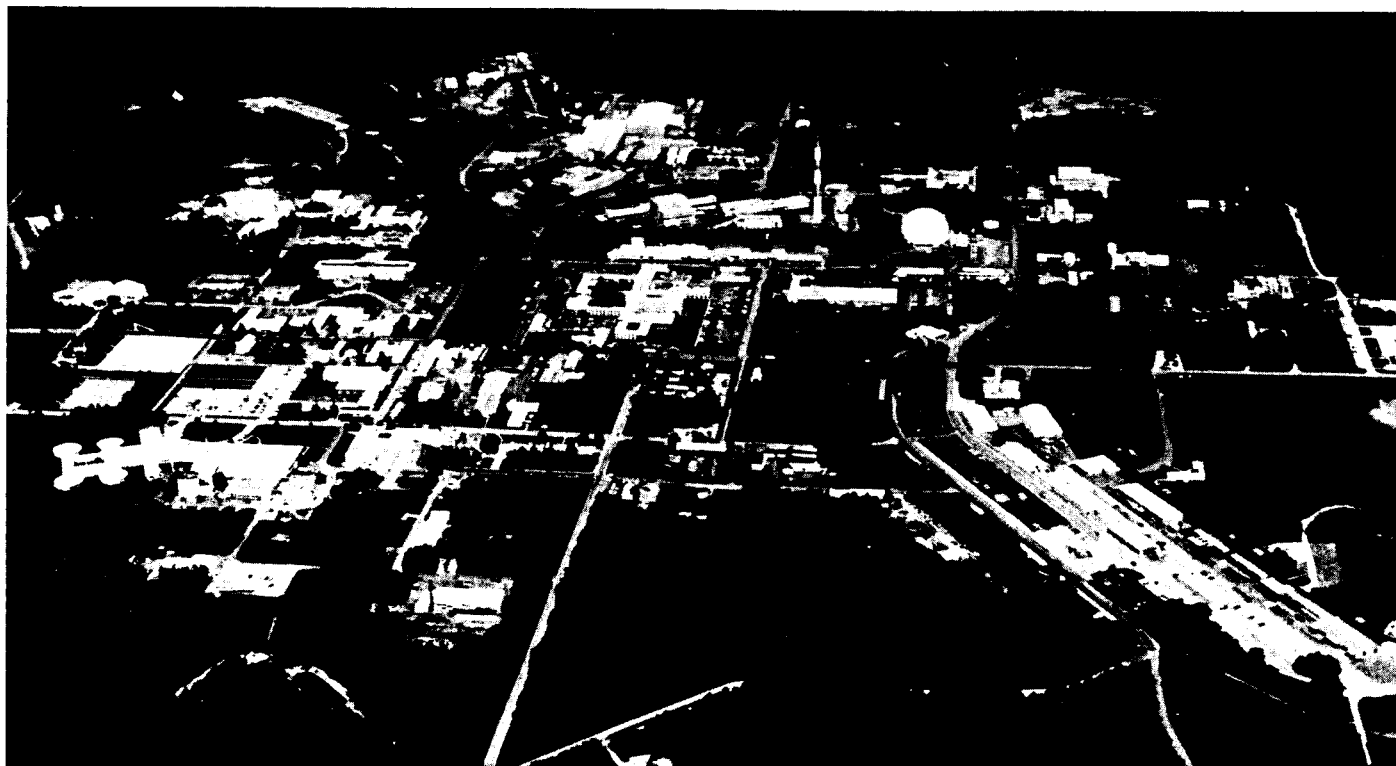
PAIRED IONS



One of the ways the RARAF group (now part of S&EP) investigates the role of radiation quality in health effects is by irradiating Chinese hamster V79 cells growing on Mylar foils, with equal doses of either deuteron molecules or uncorrelated deuteron ions. After striking the foil the individual independent ions follow a random walk described by Coulomb multiple scattering. Enhanced killing with the paired ions results from interaction between the pair of correlated tracks from each molecule.

Biology

The 1978 Biology Department Symposium on Photosynthetic Carbon Assimilation has just been published. The Symposium was devoted to an in-depth review and the current research activities on the enzyme ribulose 1,5-bisphosphate carboxylase. The enzyme has the vital role in photosynthesis of fixing atmospheric carbon dioxide into organic compounds in all plants. The rate of carbon dioxide fixation into the world biomass is totally dependent on the activity of the enzyme. The Symposium was unique in bringing together scientists from diverse areas of research including agronomists, plant physiologists, biochemists, molecular biologists, and x-ray crystallographers. Included were investigators from research, academic, and industrial laboratories from the U.S. and abroad. In addition to the technical research papers, the volume also contains a round table discussion on long range research planning in carbon assimilation. Financial support was provided by the Departments of Energy and Agriculture and the National Science Foundation.



The BNL site as seen from the air last fall.

PINY Courses

Professor John Lamarsh, Head of the PINY Nuclear Engineering Department, will be in the DEE-Oceanographic Sciences Division conference room from 6:00 to 7:00 p.m. on Wednesday, January 17 to register students.

PINY courses to be offered at BNL this semester are: NU 604, Nuclear Engineering Lab. II. Monday, D. Rorer; NU 716, Reactor Heat Transfer (no day decided yet), W. Wulff; NU 731, Nuclear Chemical Engineering, Thursday, F. Hill; and NU 619, Introduction to Thermonuclear Power, Wednesday, K. Chung. Schedules are subject to change upon consensus of instructor and students.

These courses are available to BNL employees, guests and collaborators, and to a limited number of persons not affiliated with the Laboratory.

SUNY Registration

Final registration for the Stony Brook/BNL extension courses in computer science will be held from 10:00 a.m. to 12:00 noon, Tuesday, January 16 in the Oceanographic Sciences Conference Room (Bldg. 319 opposite the bank). Dr. Daniel Dicker, Director of the Stony Brook Postgraduate Extension Program, and Mrs. Esther Weitzman will be present to enroll and counsel students.

Courses to be offered this term are: MSC 522, Compiler Design, 5:30-8:00 p.m., Thursday, D. Maier; and MSC 525, Systems Programming, 5:30-8:00 p.m., Tuesday, R. Kieburz.

These courses are available to BNL employees, guests and collaborators, and to a limited number of persons not affiliated with the Laboratory.

N.Y.I.T. Registration

Registration for Cycle C of the New York Institute of Technology will be held Thursday, January 18 from noon until 3:00 p.m. in Berkner Hall. Textbooks will also be on sale at that time. All of the following courses are held in Room 101, Chemistry Department. Classes begin February 1.

Courses which meet from 5:15 to 7:45 on the days indicated are:

World History II	Mon.
Business Law II	Tues.
Problems of Philosophy	Wed.
Algebra & Trig.	Thurs.

Courses which meet from 8:00 to 10:30 p.m. on the days indicated are:

Govt. & Business	Mon. & Wed.
Intro. to Life Sciences	Tues. & Thurs.

January 15 is the deadline for those applying to N.Y.I.T.'s M.B.A. program.

Stony Brook Events

Sunday, January 14
Concert: The Bartok Quartet, 3 p.m., Main Auditorium, Fine Arts Center. Tickets \$10, \$8, \$6. Call 246-5678 for more information.

Friday, January 19
Dance: "Disco Explosion," 9 p.m.-3 a.m., Stony Brook Union Ballroom. \$2 general admission.

Speaker: Deane Peterson, "The Sun and Its Neighbors, or Who's Who in This Neck of the Woods," 7:30 p.m., 001 Earth and Space Sciences. Telescope viewing follows, weather permitting.

Sunday, January 21
Recital: Flutist Anna Bulitta, 3 p.m., Recital Hall, Fine Arts Center.

Family Camping

The regular monthly meeting of the BNL Family Camping Club will be held on Thursday, January 18, at the Recreation Building, at 8:00 p.m.

A film will be shown by Stan Sajnicki and refreshments will be served. Everyone is welcome.

BERA Production Opens Tonight



Carolyn Henck as Sandy and Philip Schewe as Teddy Lloyd depict a tender scene from "The Prime of Miss Jean Brodie," a BERA Theatre Group production scheduled for January 12, 13, 19 and 20. The play opens this evening at 8 p.m. and tickets are available at the Cafeteria during lunchtime, at the door prior to a performance, or reservations may be called in to Tony, extension 2920. —photo by Rosen

Sale of Motor Vehicles

Four vehicles, located at Warehouse T-87, will be available for public sale. Inspection will be permitted from January 22nd through January 26th, during the hours of 9 a.m. to 4 p.m., except Saturday and Sunday.

Bids will be opened on January 30, 1979, at General Services Administration, Business Service Center Bid Room, 26 Federal Plaza, New York, N.Y. This will be an informal competitive bidding. Bid forms may be obtained at Buildings 87 and 211. For further details, please call Extensions 2302 or 2977.

Cooking Exchange

On Wednesday, January 24, the BNL Cooking Exchange will proudly present Jacqueline Newman, Chef Extraordinaire. Mrs. Newman will demonstrate recipes from her extensive Chinese repertoire.

This is a once a year occasion that shouldn't be missed. Make your plans now to be at the Recreation Building at 12:30.

Cafeteria Menu

Week Ending January 19, 1979	
Monday, January 15	
Potato leek soup	(cup) .30
	(bowl) .40
Turkey a la king on toast points	1.30
Western omelette and 1 veg.	1.25
Hot Deli - Pastrami	(on bread) 1.15
	(on roll) 1.25
Tuesday, January 16	
Split pea soup	(cup) .30
	(bowl) .40
Chinese pepper steak on rice	1.35
Barbequed spare-ribs and black-eyed peas	1.40
Hot Deli - Sloppy Joe	(on bread) 1.15
	(on roll) 1.25
Wednesday, January 17	
Cream of spinach soup	(cup) .40
	(bowl) .50
Breaded flounder filet w/fr. fr.	1.30
Stuffed pepper w/spaghetti	1.35
Hot Deli - Baked Virginia ham	(on bread) 1.25
	(on roll) 1.35
Thursday, January 18	
Beef barley soup	(cup) .30
	(bowl) .40
Tacos w/refried beans	1.35
Scalloped ham and potatoes	1.30
Hot Deli - Smoked turkey breast	(on bread) 1.25
	(on roll) 1.35
Friday, January 19	
Fish chowder	(cup) .30
	(bowl) .40
Filet of fish parisienne	1.40
Pizza deluxe and tossed salad	1.30
Hot Deli - Meatball hero	1.25

Marion Willigan Retires Today

Marion C. Willigan, a Contract Finance Specialist in the Administrative Branch of DOE's Brookhaven Area Office, will retire on January 12, 1979 after 36 years of service with the Federal Government. Marion's career began with the War Department at Camp Upton. She transferred to the Atomic Energy Commission upon the establishment of BNL and except for two years spent at the Albuquerque and Nevada Operations Offices, has been working at the local Brookhaven Office from its inception. This included the transitions from AEC to ERDA to DOE. She plans a winter vacation in Florida enjoying her new life style.

Pool Schedule

Weekdays

11:00 a.m. to 1:30 p.m.
 Employees Only
 5:00 to 9:30 p.m.
 Employees/Family Members/Guests*

Weekends

1:00 to 6:00 p.m.
 Employees/Family Members/Guests*
 New season tickets for the period January 2 through April 30, will be sold at the pool starting on re-opening day.

Season ticket prices:

\$15 Individual
 \$25 Family

Daily admissions:

\$1 Employee/Family Member
 \$1.50 Guest*

*One guest per employee is permitted at the pool. Advance arrangement for additional guests (but not more than five at any one time) may be made at the Recreation Office. Employees will be responsible for the conduct of their guests.

Arrivals & Departures

Arrivals

Lydia C. Amodeo	Accelerator
James J. Briggs	Accelerator
Walter H. Doyle	Accelerator
Richard J. Gagliardi	Plant Engr.
Phyleate Harris	Energy & Env.
Donna E. Haugland	Supply & Materiel
Patricia C. Lebitski	Physics
Joseph C. Roecklein	Accelerator
Charles J. Thiessen	Accelerator
Siu W. Tong	Biology
Jacqueline A. Vernon	Applied Math.

Departures

Lawrence G. Dilworth	Plant Engr.
Marie M. Dorage	Physics
Joseph J. Fedelem	Energy & Env.
Elaine Korby	Energy & Env.
Edward G. Skolnik	Energy & Env.

BERA Sales Office

Located in the Cafeteria (Ext. 3347), the BERA Sales Office is open weekdays between 9:00 a.m. and 1:00 p.m., and offers the following services:

Film processing and supplies. The film service offers employees a discount on processing, film, flash bulbs, and batteries. Cameras, albums, frames, and other photographic equipment may also be purchased. A receptacle is available for dropping off film to be processed during hours when the office is closed.

Ticket services. Some tickets for Islanders hockey games and Metropolitan Opera performances are still available. Call or stop in the office for open dates. Discount coupons for Walt Disney's Magic Kingdom in Florida and Disneyland in California are distributed free of charge to the employee. One dollar discount tickets are now being given for the Greater New York Auto Show to be held at the New York Coliseum from January 27 through February 4.

Miscellaneous merchandise sales. Items include BNL jackets and assorted greeting cards.

LIFT Hosts DOE Speakers

The recently enacted National Energy Act will be the topic of a January 18 program presented by LIFT, the Long Island Forum for Technology, Inc. Held at the Polytechnic Institute of New York at Farmingdale, the program's agenda includes talks by Robert A. Low, Regional Representative of the Secretary of Energy and by Charles Baxter, Field Representative, DOE.

After breakfast at 8:30 a.m. and opening remarks by LILCO president Wilfred O. Uhl, speakers Low and Baxter will discuss energy conservation, coal conversion, the Energy Tax Act, public utility regulatory policies and natural gas pricing regulation. A question and answer period precedes lunch at 1:30 p.m.

Admission for LIFT's National Energy Act program, including continental breakfast and lunch, is \$25 per non-member, \$15 per LIFT member and \$10 per student. Reservations may be made by forwarding payment by January 12 to LIFT Admission, c/o Polytechnic Institute of NY, Route 110, Farmingdale, NY 11735, or by calling LIFT at 694-5500.

Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position, with consideration given to candidates in the following order of priority: (1) present employees within the department, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment, as indicated below. Except when operational needs require otherwise, positions will remain open for one week following publication date.

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

LABORATORY RECRUITMENT: Opportunity for present Laboratory employees.

874. ADMINISTRATIVE ASSISTANT - AAS degree in business administration or equivalent capabilities. Requires supervisory experience and background associated with union regulated work force. Excellent oral and written communications skills required. Basic knowledge of shipping, receiving and warehouse systems desired. Supply and Materiel Division.

875. CLERK-TYPIST - Requires excellent typing and filing skills and basic shorthand. To assist in central office with typing, filing, record keeping and receptionist duties. Supply and Materiel Division.

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

876. ELECTRONICS TECHNICIAN (three positions) - Requires AAS or equivalent in electronics technology and good background in low level analog and digital circuitry. Should be skilled in the construction and debugging of prototypes. Accelerator Department, ISABELLE Project.

877. ELECTRONICS TECHNICIAN - Requires AAS in electronic technology or equivalent and experience in constructing, testing and troubleshooting pulse and analogy circuits. Familiarity with high voltage, high current power supplies desirable. Accelerator Department.

878. MECHANICAL TECHNICIANS (two positions) - Requires AAS or equivalent capabilities in mechanical technology. Vacuum experience desirable. Accelerator Department, ISABELLE Project.

879. MECHANICAL TECHNICIAN - Requires skills in the careful assembly of large mechanical components and the associated detailed documentation. Accelerator Department, ISABELLE Project.

880. RESEARCH SERVICES ASSISTANT - Requires basic knowledge of biology and chemistry principles, ability to handle and dissect small animals, accuracy in collecting and recording data and performing basic mathematical calculations. To be trained as assistant to a pulmonary toxicology research team. Medical Department.

881. CLERICAL ASSISTANT - To work in clerical pool on on-call basis. Technical typing experience highly desirable. Applications will be accepted from those interested only in part-time work. Personnel Division.

882. OFFICE SERVICES ASSISTANT (two positions) - Temporary (approximately one month). Requires good typing skills and willingness to be trained on MICOM Word Processing System. Department of Energy and Environment.

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

884. REFRIGERATION AND AIR CONDITIONING ENGINEER (two positions) - Demonstrated experience in trouble-shooting, repairing, installing and operating commercial/industrial air-conditioning/refrigeration equipment, including steam absorption, centrifugal and helical screw refrigeration machines. Plant Engineering Division.

885. EXPERIMENTAL MACHINIST - Demonstrated experience in all round prototype machinery required. Central Shops Division.

886. TECHNICIAN - AAS or equivalent capabilities in electro-mechanical technology with experience in the operation, maintenance and repair of mechanical, electrical and vacuum equipment required. Rotating shifts. Physics Department.

887. SENIOR STATIONARY ENGINEER - Experience in the operation of high pressure boilers using # 6 oil required. Current stationary or marine equipment engineers license desirable. Plant Engineering Div.

Autos & Auto Supplies

69 PONTIAC WAGON - overhauled eng, new exhaust sys, runs well. Best offer. 585-2033 after 6.

73 DODGE - Dart Spt, a/t, ps/pb, a/c, new radials, AM/FM, clean. Asking \$1795. Pat, Ext. 4628, 286-8490 eves.

1 CHEV VEGA RIM - 13" w/very good tire. \$15. 331-2779.

72 VOVO 145E STATION WAGON - fuel injection, AM/FM. \$1800 firm. Ext. 2831.

70 BUICK SKYLARK - a/t, 88,500 mi, 6 cyl, good cond, radio, avail Jan 31. Kaiho, Ext. 3531, 345-3073 after 6.

7.50X14 TIRE W/RIM - \$10; asstd tires E70-14 - D78-14, mostly for spares, \$3-8. Sue, Ext. 4207.

5 RADIAL TIRES - BR78-13 b/w. \$25 ea. F. Rumph, Ext. 4581, 588-3565.

77 DODGE VAN - windows, sun roof, captain's chairs, AM/FM w/cassette deck, 4 radials, 2 snow radials (all 6 new), std V8, reg gas. \$5000. Anita, Ext. 3389.

78 TOYOTA COROLLA - 5 spd, rad tire. \$3400, flexible. Ext. 2337.

72 CHEVY LUV TRUCK - 45,000 mi, runs well, w/ snows. \$1200. 475-3415 after 5.

72 MERCURY STATION WAGON - Montego Villager, ps, p/disc brakes, a/c, 9 psgr, new tires, roof rack, towing pkg, snows. 821-0695 after 3.

77 FORD COUNTRY SQUIRE WAGON - 30,000 mi, loaded w/options, good cond, new radials. \$4500. Dalal, Ext. 7790.

64 MERCURY COMET - 6 cyl, a/t, good cond, reliable transp, 2 extra wheels w/mounted snows. \$350. 928-0297.

AIR SHOCKS - Gabriel Hi Jackers for 1965-79 Ford or Merc, used 1 mo. \$30. Joe, Ext. 3273.

66 MGB - hdtp, eng, trans, rear, wire wheels, disc brakes (body bad); 74 Vega parts, trans, doors, other parts. 732-3118.

69 FALCON STATION WAGON - p/s, a/t, good cond. \$600. Yoshiki, Ext. 4008.

68 JEEP - 4 w/d, good cond. 924-3919.

69 MERCURY CYCLONE - 4 spd, 390, red, dual exhaust, runs well, needs brakes. \$400. Dave, 585-5036.

74 PONTIAC FIREBIRD - 6 cyl, a/t, 68,500 mi, excel cond. \$2250 firm. Ext. 7941, 588-4882.

75 SPORTABOUT WAGON - 6 cyl, a/t, p/s, a/c, AM radio w/FM converter, roof rack, new front brakes. Bill Lebitski, Ext. 2898, 473-6994.

SNOW TIRES - new Michelin 165SR15, 2/\$100; used Goodyear 165-15, 2/\$10; also new Goodyear steel radial 165SR-15 & Volvo wheel. Ext. 4727.

70 TOYOTA - 4 dr sedan, runs well, trans needs some work. \$375. Ext. 4243, 698-3918.

67 PONTIAC BONNE CONV - runs well, good shape. \$150. John, Ext. 4243, 924-3492.

71 VW SUPERBEETLE - 12,000 mi on new motor, all new parts, tires, excel running cond. \$1000. 821-9419.

66 CHEVELLE - 6 cyl, a/t, reliable transp, good running cond, new batt. \$200. Ext. 4219.

69 DODGE WAGON - good eng, new trans, brakes & other, inspected, reliable transp. \$450. George, Ext. 2674/3010.

TIRES - (1) HR78-14 steel belted radial, \$10; (1) GR78-14 Uniroyal snow, \$15; (1) Philco in-dash AM push-button radio, \$15. Chris, Ext. 3919, 929-4310 after 6.

69 FORD LTD WAGON - 390 V8, a/t, ps/pb, a/c, good runner. \$300. 298-4608.

74 FIAT 128 - 2 dr sedan, 58,000 mi, excel cond, new front end, valve job, brakes, muff, batt, AM/FM/cassette. \$1500. 286-0384.

Boats & Marine Supplies

25' MORGAN 1976 - sleeps 5, main & jib 310 sq ft, 5 hp Evinrude, 2 burner stove, icebox, ss sink, toilet. \$13,700. Ext. 3354, 727-7722.

12' FIBERGLASS - w/trailer, excel cond. \$275. Ext. 3084 after 5.

Miscellaneous

STEREO PHONOGRAPH - excel cond; Singer rug cleaner & floor polisher, liquid dispensing model, scrubber, waxer, buffer, shampooer. Ext. 2145, 736-2511 eves.

FRENCH BOOKS & TEXTS - 13 different. Dennis, Ext. 4259, 736-2534 eves.

HAIR DRYER & STYLER - Remington, never used. \$10. Ext. 3072.

OIL BURNER GUN - with 1/8 hp, 115 v Westinghouse Thermoguard motor, old but runs well. \$10. 589-3269.

GUITAR - Gretsch elec w/case. \$80. Ext. 2547.

NEW S&W JET PUMP - 30 gal tank, 1/2 hp, all controls; snow blower, 20" Power Drive; air compressor, sm, all controls; shop vac, 10 gal. GR5-0831.

RCVR/TURNABLE COMBO - KLH model 24, reasonable. Ext. 2831.

POOL TABLE - 6'9"x37" w/2 cues, balls, good cond. V. Brown, Ext. 2874, AT6-9257 after 6.

CAMERA - Kodak Brownie Starmatic w/flash & Argus pre-viewer, \$12; 1 pr roller rink shoe skates, size 4, blk w/carry case, almost new, \$15. GR5-8658 after 7.

1 GAL PICNIC JUG - \$2; elec coffee pot, \$5; Toast-master toaster, \$5; Polaroid Big Swinger, \$5; 2 under-cabinet floor lights, \$5; CB window antenna, \$3. Kathi, Ext. 2913.

PING PONG TABLE - like new, seldom used. \$25. Ext. 4042, 928-7993.

MIKE - w/stand. \$65. Ext. 4003, 924-4373.

WASHING MACHINE - Sears portable, excel cond. \$100. Henry, Ext. 3084.

WOOD STORM WINDOWS - (10) 59"x31", (2) 43"x31", \$2 ea; wood door, 79"x32"x1 1/4", \$5. J. Olson, 289-8629 after 6.

CANVASES - artist's 7x9, 60¢/pk of 3; chaise lounge, green webbing, \$5; TV tables, \$6 & \$3. Rich, Ext. 4172.

2 HOCKEY TICKETS - Lab seats, Islanders vs Buffalo, March 31. \$9 ea. D. Christman, Ext. 4394.

FUR JACKET - ideal for college student, good cond, sm-med, brown. Ext. 2926, 584-6919.

FIREPLACE - Atlanta free standing, used less than 1 yr. 924-7929 after 6.

DRESSER - \$15; baby scale, \$10; ice chest, \$7; travel sprinkler, \$10; bath scale, \$5; contour chair, needs uphols, \$10; Reo mower, \$20. Palais, Ext. 2913, 698-0576 after 6.

SKI BUS - Windham or Hunter, every Sunday leaves 6 am, returns 10 pm, incl trans & lift tickets, Howard-Johnson Medford. \$25. 289-8733.

RAMSET FASTENING GUN - like new, w/case, drive pins, charges. \$100. Frank, 732-4224.

ICE SKATES - size 4, European riding boots equiv to size 9; also asstd games (blocks, GI Joe, etc.). 286-3742.

HARDMAN & PECK BABY GRAND - 25 yrs old, Louis XIV style, perf pitch, child disenchanted w/lessons. Sacrifice - \$1500. Ed, Ext. 4122 or Carol, Ext. 3341.

2 UPHOLSTERED CHAIRS - \$25 ea; Castro conv, sleeps 2, good cond, \$150. Henry, Ext. 3084.

HIDE AWAY BED - Simmons queen size, gold/rust/orange Herculon, good cond. Linda, Ext. 4173, 477-1239.

TYPEWRITER - antique, Remington Model 10, manual, 1940's era, excel cond, works. Dennis, Ext. 4259, 736-2534 eves.

SKI BOOT - Caber Beta 6 1/2, used 1 season. Ext. 4663, 724-7891.

BIKE - men's 10 spd, 21 1/2" frame, \$70; child's bike seat, \$12; toddler expandable play-yard fence, \$10. 475-0144.

RECLINER W/COVER - \$35; off chair, all wood, w/wheels, \$25; bowling balls, \$4 & \$6. Ext. 4172.

STOVE PIPE - triple wall Thor pipe, 3-30" sections. \$100. Ray, Ext. 4479.

RIFLES - (2) Browning .303 Win. bolt action w/4X scope, \$325; Winchester Mod. 94, .30-.30, \$125. Ext. 3570, 744-9746 eves.

2 OPERA TICKETS - Thurs, Feb 1, Madame Butterfly, family circle. \$15. Peter, Ext. 4340, 698-2088.

BLACK STOVE - air tight, used 6 mo. \$225. 589-9103.

REFRIGERATOR - apt size (24" w). excel appearance & cond, white. \$60. Adams, Ext. 2011.

ICE SKATES - men's size 9, hardly used, \$6; med size couch, good cond, \$25. 727-1617.

THERMOGRATE - 8 tube fireplace grate, 26h x 26w x 17d. Cost \$125 new, make offer. Bob, Ext. 4551.

21" TV CONSOLE - b/w. \$50. Betty, 286-0369.

OIL BURNER PACK - used, good cond, Metal Master. \$50. 286-2788.

COLONIAL BEDRM - 8 mos old, queen mattress & box spring w/cannonball head & foot boards, 2 night tables, chest, lighted dresser. 589-1069 after 6.

STEREO - AM/FM turntable console, \$50; lamp tables, 4 pcs, 2 end, 1 corner, 1 coffee, lamps. \$80. 472-0553.

KING TUT TICKETS - have 4 for Jan 16 at 11:30 & 4 for Jan 20 at 5:30. Wish to exchange for 8 all on same day. 689-9390.

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

NIAGRA CYCLO-MASSAGE - for arthritis or whiplash sufferer, heats & massages at one time. Was \$329, sell \$100. Claire, Ext. 3655, 281-2002.

SEARS BEDSPREAD - brown/white/blue patchwork print, queen size, w/floor length capes to match, like new. \$25. 281-8016 eves.

OLD OIL BURNER - in working cond, free if you take it away. M. Greene, Ext. 4033.

HOCKEY ICE SKATES - Baur, boy's size 4; Lady Franklin wood burning fireplace. Sal, Ext. 4703.

BOY'S HOCKEY SKATES - size 3, "Canada Cup," excel cond. \$15. Mickey, Ext. 3218.

ICE SKATES - boy's hockey leather, size 2, 3, 5; boy's blk figure leather, size 1, 3; \$5 ea pr. Ron, Ext. 3300, 924-6977.

COLECO AIR HOCKEY - \$65 new, asking \$25. AT9-0687 after 4.

GUITAR AMP - Masco 30 w 3 channel (2 inst, 1 mic) amp w/built-in 12" spkr. \$60 or best offer. Alan, Ext. 2928, 821-0761.

ICE SKATES - boy's, black, gd cond, size 3, \$4; 2 pr shoe-skis, 12 in. long, strap-on, suitable for 6-8 yr old, \$1 ea. Watson, 286-3679.

SYLVANIA COLOR TV - needs picture tube, table model with stand \$40. Fran, Ext. 3725.

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

MASTIC BEACH - 3 bedrms, 2 baths, woodburning stove, above ground pool, 100'x100', patio, shed, fin bsmt, 3 appl, VA appraised. \$26,000. 281-5392 eves.

RIVERHEAD - mobile home, 12x65, 2 bedrms, w/w, dishwasher new, washer, dryer, shed, patio, dbl driveway, must see to appreciate, excel cond. Reasonable. 369-2236.

RIVERHEAD - 1 yr old 3 bedrm ranch, all appl, fireplace, 1 1/2 car garage, 1/2 acre land, compl landscaped. \$43,500. 727-7304 after 5:30.

COLUMBIA COUNTY - 3/4 acres w/mobile home, oil & elec, dead end corner property, 2 lakes, 90 mi from NYC, taxes \$300. \$17,000. 914-969-5619, or Ext. 4662, ask for Jimmy.

ROCKY PT - The Tides, 70' ranch on 1/2 acre, 3 bedrms, L/R, D/R, den w/fp, eik, 2 full baths, oak floors, patio, full bsmt. \$45,000. 744-6482.

MASTIC BEACH - long-line ranch, 2 over-size bedrms, cabinet-lined kitchen, formal D/R, den, full bsmt, baseboard heat, 1/4 acre. \$27,995. 281-5498.

SHOREHAM - custom colonial, 3 bedrms, 1 1/2 baths, den w/fp, eik, formal D/R, full bsmt, 2 car garage, patio, 0.43 acre, deeded beach rights. \$64,990. 744-1081.

RIDGE AREA - must sell 3 bedrm ranch, 1/2 acre +, 2 baths, eik, D/R, den, w/w, appl, full bsmt, extras. Call our realty. Rohal, 585-1200.

SHOREHAM - 4 bedrm custom built colonial, 2 1/2 baths, 2000 sq ft liv space, 2 car garage, w/w, s/s, 1 acre fenced & landscaped. \$56,500. 744-2821.

ST JAMES - Head-of-the-Harbor, custom farm ranch, 1 mi from priv beach, 6 bedrms, 5 baths, 3 fp, on 2 + heavily wooded acres, variance for horses, all appl. 584-6058 or 981-1327.

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

E. PATCHOGUE - Must sell, 3 1/2 hr custom built over-sized 9 rm wide ranch, prime area, 4/5 BR, 2 1/2 baths, huge eik, DR, dens, 2 garages, appl, carpeting, beautifully landscaped. 289-0443.

SHOREHAM - 10 rms, 2 baths, sunken L/R, new eik, deck, patio, acre, low taxes. \$55,000. 744-7370.

For Rent

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

MIDDLE ISLAND - 1 bedrm, central a/c, 5 appl, swim pool, clubhouse, avail mid Jan. \$250/mo, gas, heat incl. 924-0336.

SHIRLEY - 3 bedrm ranch, L/R, D/R, den w/fp, w/w, 5 mi from Lab, references required. \$350/mo. 281-8016.

BELLPORT - 2 rms w/lg bathrm in comfortable home. \$175/mo, util incl. Ext. 3583.

CENTER MORICHES - 2 bedrm apt, L/R, kitchen, bath, quiet secluded area. \$275/mo, util incl. Joe, 929-8281.

MANORVILLE - 1 bedrm duplex, fp, w/w, dish-washer, a/c, storage shed, patio, free club facilities, immediate occupancy. \$291/mo. 878-9250.

VERMONT - 3 B/R, 2 bath cape, fp, garage, ski X-country or down hill. 732-6499.

RIDGE-LAKE PANAMOKA - 2 rms + bath, util, garage, unfurn. \$175/mo. 929-4818.

WADING RIVER - 4 bedrms, appl & util incl, priv entrance, avail Jan 15. \$295/mo. Rae, Ext. 2387, 929-8846.

MT SINAI - 1 rm furn efficiency apt, priv entrance, female preferred. \$185/mo, util incl. 331-2779.

PT JEFF - 1 bedrm apt w/balcony. \$250/mo incl util. Sam, Ext. 2675.

Wanted

USED UNICYCLE - M. Elzinga, Ext. 2364, 929-8944.

DBL DECKER YOUTH BED - 286-0284.

MYLEC GOALIE PADS - and/or waffle for street hockey. David, 928-6654.

CLEANING PERSON - 1 day/wk, steady, for 1 bedrm apt in Coram area. Mary, Ext. 2318.

CAR SEAT - for 1 yr old. Reasonable. Carol, 821-9547.

GOOD HOME - for 1 yr old white cat, male, lovable. Sue, Ext. 4691.

TO RENT - motorcycle trailer, 2 wks in April. Michael, Ext. 2081.

KITCHEN SCALE - also hand truck. Bill, Ext. 4662, 298-4089.

BABYSITTER - mature, daily 8-4, 21 mo old girl. 928-8737.

LIVE IN "GRANDMA" - to care for our year-old son, room, board & stipend, Smithtown area. 979-0607, 9 am - 9 pm.

USED BICYCLE EXERCISER - reasonable. Fern, Ext. 7700.

TRAINS - Lionel, any "0" gauge or "027" gauge, cars, track & equipment. Frank, Ext. 4212.

TRAVEL TRAILER - 19 ft. Ext. 4108.

ROOMMATE - to share house in Shirley with 2 roommates. \$92/mo plus util. 399-4981.

Lost & Found

LOST - 2 dogs from onsite apartment: white, male, Samoyed, beige collar w/M.I. rabies tag, answers to Jacob; black, female, Cocker Spaniel/Labrador Retriever, tag Gratton, Mass., answers to Felicia. Reward. Call 345-3032.

LOST - ladies' lt brown coat belt, in or out of 911B. Ext. 4756.

Car Pools

PERSONS WANTED - for car pool Exit 29 or 30 on SS Pkwy. Frank, Ext. 3898.

PATCHOGUE - temporary, need car pool to Lab, willing to pay. Ext. 3322.

BLUE PT OR W PATCHOGUE - 5th driver needed. G. Strickland, Ext. 4091.

MASSAPEQUA - Exit 29 So State Pkwy, want to join or start car pool, 8 am - 4:30 pm. Paul, Ext. 2022.

Services

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

OLD ENGLISH CHIMNEY SWEEPS - cleaning, reasonable; also light hauling, trash removal. 286-8561.

LOCAL, LONG & LIGHT TRUCKING - moving, avail Mon-Thurs eves, all day Sun & holidays. 727-5912.

LANGUAGE TUTORING - learn Spanish & German for business or pleasure, native speaker. \$10/hr. 698-3347.

THESIS & PUBLICATIONS ILLUSTRATED - med, chem, bio, electromechanical - drawings, charts, schematics, wiring diagrams, instrumentations & lettering professionally executed. Reasonable. Yani, Ext. 2514.

NEW & USED TIRES - rims, repairs, mag wheel service, reg, radial, Dunlop-Gillette, free instal, balance avail. Fred Usack, Ext. 4597 lunchtime or 475-4935 eves.

Classified Ad Policy

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

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

5. Ads not carried because of space restrictions will be held for publication in the next issue.

6. Ads are run only once and must be resubmitted if they are to be repeated.

7. Ads should be restricted to 20 words or less and typed or printed on the form provided, and must bear the employees 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, 40 Brookhaven Avenue.

(Name & Phone No. To Call)

Employee's Signature

Life No. Ext.

Send to: Brookhaven Bulletin, Building 460, 40 Brookhaven Avenue (Ext. 2345).