

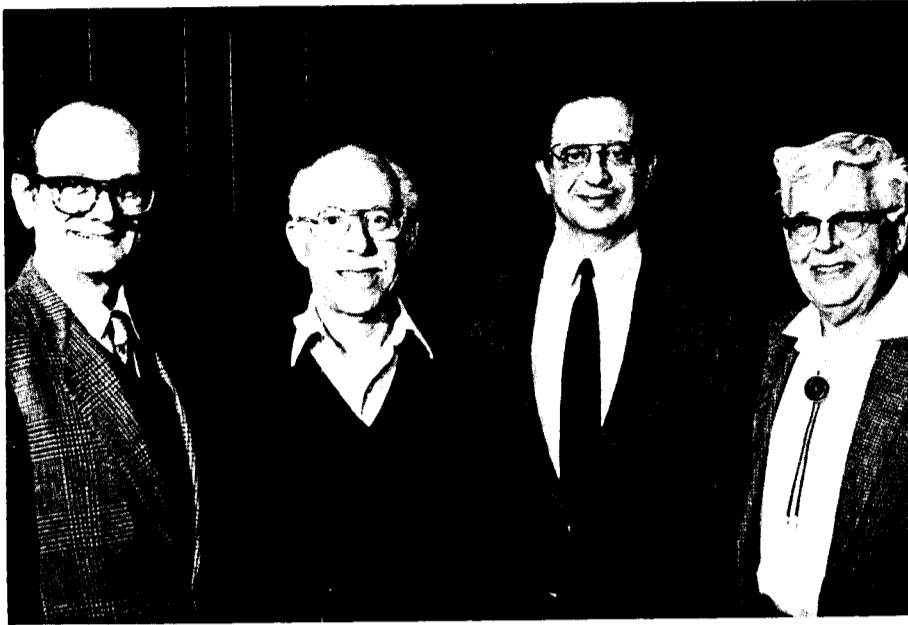
Setlow's Work on DNA Repair Leads to 1988 Fermi Award

Recognition of his contributions to the fields of radiation biophysics and molecular biology came again to Richard Setlow last month, when Secretary of Energy John Herrington announced that BNL's Associate Director for Life Sciences is one of two winners of the Department of Energy's (DOE) 1988 Enrico Fermi Award. The other 1988 recipient is physicist Victor Weisskopf, of the Massachusetts Institute of Technology.

The highest scientific award given by DOE, the Fermi Award recognizes exceptional and altogether outstanding scientific and technical achievement in the development, use or control of atomic energy. At an awards ceremony in Washington, D.C., each recipient will receive a Presidential citation, a gold medal and a \$100,000 honorarium.

Setlow's citation reads: "For his pioneering and far-reaching contributions to the fields of radiation biophysics and molecular biology, beginning with the discovery and conceptualization of the processes of DNA repair that have had an impact on research in genetics, recombination, mutation and carcinogenesis."

Learning of the honor, BNL Director Nicholas Samios said, "I think it's marvelous that Dick Setlow has won



Shown with 1988 Fermi Award winner Richard Setlow (second from left) are (from left) Benno Schoenborn, head of the Center for Structural Biology in the Biology Department; BNL Director Nicholas Samios; and Herb Kinney, Special Assistant to the Director.

this prestigious award. Dick is a biophysicist, and the award is being given for his contributions to the life sciences, demonstrating once again the unity of all the sciences. We are happy that some of Dick's outstanding research has been done while at

BNL, and we are proud of the Laboratory's role in his achievements."

Setlow received his A.B. in 1941 from Swarthmore College, where he was in the class behind BNL Senior Physicist Ernest Courant, a 1986 Fermi Award winner. From 1941 to 1961,

Setlow taught physics and biophysics at Yale University. After earning his Ph.D. in physics at Yale in 1947, he joined the new biophysics group in Yale's Physics Department.

In 1961, Setlow joined the staff of Oak Ridge National Laboratory's Biology Division, then directed by the late Alexander Hollaender, a long-time consultant to BNL's Biology Department and winner of the 1983 Fermi Award.

At Oak Ridge, in the early 1960's, Setlow discovered the processes of DNA repair in cells.

Since the 1940's, it had become increasingly clear that damage to DNA, the double-stranded genetic material that carries hereditary characteristics, could be harmful. However, said Setlow, "No one knew what that damage was until two Dutchmen, Beukers and Berends, irradiated one part of the DNA called thymine, in ice, and observed that the thymine formed dimers, or a covalent bond between two thymines, and that dimers were also formed in DNA irradiated with ultraviolet light."

Setlow developed a means of observing the rate and wavelength dependences of dimer formation and breaking. Using these photochemical techniques, he and his collaborators showed that dimers caused structural defects resulting in biological damage.

In other work at Oak Ridge, he looked at dimers in a very ultraviolet-sensitive strain of bacteria. Setlow recalled that he and colleagues William Carrier and Paul Swenson "showed that these dimers inhibited DNA synthesis in these bacteria much more than in normal bacteria. Since there was an equal number of dimers in both bacteria, we wondered if the resistant cells were treating the dimers differently."

In both kinds of bacteria, the dimers create lesions on only one of the two DNA strands. The difference, Setlow found, is that in normal bacterial cells, enzymes can excise these lesions, while the second strand of DNA is used as a template for replication. Thus, the damage is not perpetuated.

This discovery of excision repair showed for the first time that the genetic material is subject to biochemical turnover, a notion resisted at that time by most geneticists.

Today, DNA repair is a classic example of the unanticipated, widespread benefits of basic research, and, said Setlow, "DOE's Office of Health and Environmental Research deserves the credit for supporting the origins of this research field."

Setlow left Oak Ridge in 1974 to
(Continued on page 2)

Manning Takes Helm of Staff Services

H. Ronald Manning officially became Manager of the Staff Services Division (SSD) on January 1. Over the next three months, however, Manning will be working in close cooperation with SSD's previous manager, William S. Webster, to ensure a smooth transition before Webster retires from the Laboratory in April.

In announcing the change, Henry Grahn, Associate Director for Administration, noted, "Ron will bring strong credentials to the position. He has 19 years of experience at BNL, with increasing responsibilities in administrative management. . . . He has keen knowledge of the support needs of scientific departments, particularly those services that the SSD provides. . . . Over time he has developed an in-depth knowledge of BNL policies, practices and procedures, all necessary requirements to manage the SSD."

Grahn also recounted some of Webster's accomplishments at the helm of SSD. These included overseeing two major changes to the Lab's telecommunications system: the 1971 switch from antique cord switchboards, requiring ten operators, to the Centrex system, which needed only four, and the 1981 cutover to the pres-

ent GTE telephone system, which uses three operators and will save an estimated \$10 million over the ten-year contract term.

Grahn recalled that Webster also, very early on, turned BNL's Travel Office into an in-plant operation that now earns commissions covering all the costs of Travel Office personnel. In sum, said Grahn, "Bill has given us over 23 years of valuable service. We will be wishing him a happy and well-earned retirement."

The division that Webster will leave and Manning now heads includes about 50 employees who provide the Lab staff with services necessary to allow research to be done smoothly, as well as services that provide for employee and visitor accommodation. These services include travel, housing, transportation, mail and wire services, records management and storage, meeting and conference facilities, food services and the on-site auto service station.

"My basic premise," said Manning, "will be to maximize these services for the customers, while keeping them as efficient and economical as possible. The key elements are understanding the customers' needs and having the support of the people in my division in order to meet those needs."

With this in mind, Manning said, "I will be very interactive — accessibility for our customers and our staff will be very high. I want to know from our customers what they want from the division, and I'm going to work with the staff so we all understand in the same way what we are trying to achieve."

Manning's ideas about what he would like to achieve are based on a career that he has spent entirely in research administration. After receiving his B.S. in chemistry from Louisiana State University in 1963, he earned his master's in business administration from Purdue University in 1964.

He began his career in 1964, as assistant to the R&D Center administrator at General Tire & Rubber Com-



H. Ronald Manning

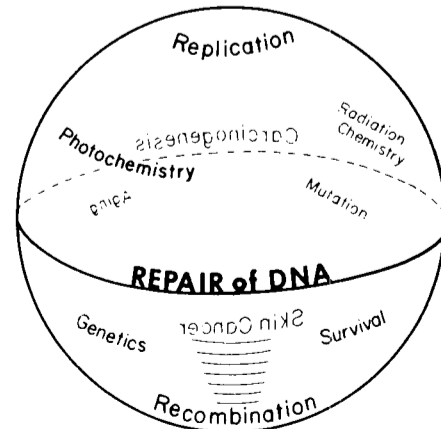
pany, Akron, Ohio. He left in 1969 to come to BNL as Physics Department Administrator. It was here, he said, "I became a user of all aspects of Staff Services."

Manning left Physics in 1986, to become Grahn's assistant. His responsibilities included working on government audits and appraisals of Lab functions — some of which dealt with such aspects of SSD as travel, housing and motor vehicles. Through this process, he said, "I have learned quite a lot about the division, to understand many of the different processes. Obviously, there is much more for me to learn, from our customers as well as my staff, and, of course, from Bill Webster, as we work together during the transition period."

Now, as head of SSD, reporting to Business Manager Bernard McAlary, Manning said that, with the help of the SSD staff, he will combine what he has learned as a user of Staff Services and as an examiner of the division "to take the opportunities that always exist to serve the customer better, while meeting the objectives of Lab management to optimize the resources that go to research and minimize the cost of administration."



William S. Webster



Illustrating Richard Setlow's belief that "science is never done in isolation," on one side of this drawing are the fields that contributed to his findings; on the other side are those fields that have benefited from it.

Marking Service Milestones



Roger Stoutenburgh

Members of the Department of Applied Science (DAS) who recently observed BNL anniversaries were honored in December at a reception hosted by DAS Chairman Bernard Manowitz (standing, right). Those celebrating above are: (standing, from left) James Kierstead, Kathleen Barkigia and Martin Leach; (seated from left) Robert Brown, Thomas Butcher and Walter Reams. Not pictured are Jan Collinson, James Egan, James Hurley and Paul Michael.

Speakers Bureau

Stephen Musolino, S&EP; Gregory Van Tuyle, DNE; Conference on Ecology at North Shore High School, Glen Head, "Nuclear Energy/Nuclear Wastes," May 11.

John Hennessey, PE; Career Awareness Day at Islip Learning Center, "Careers at BNL," May 18.

Eva Bozoki, NSLS; "Synchrotron Radiation"; Sally Dawson, Phys., "Quarks & Leptons: Subatomic Building Blocks"; Donald Gardner, Phys., "History & Theory of Wooden Truss Bridges"; Science Explorations at Suffolk County Community College, May 23.

Michael Creutz, Phys.; Nassau County Science Explorations at Hofstra University, "Elementary Particles," May 24.

R. C. Anderson, DO/Ret.; Port Jefferson Rotary Club, "BNL General," June 6.

Mona Rowe, DO; St. Isidore's Holy Name Society in Riverhead, "BNL General," June 13.

William Marcuse, DO; Purchasing Managers' Association, "Technology Transfer," September 28.

Eric Forsyth, ADD; Kiwanis Club of Patchogue, "BNL General & SSC," October 11.

David Stampf, CCD; Long Island Computer Association, "Computing at BNL: The Revolution Continues," October 21.

James Brower, S&EP; Career Day at Harborfields High School, "Careers in Science," October 25.

David Christman, Chem.; Alice Shih, Bio.; Gelinus Junior High School Science Fair, Science Fair judges, December 1.



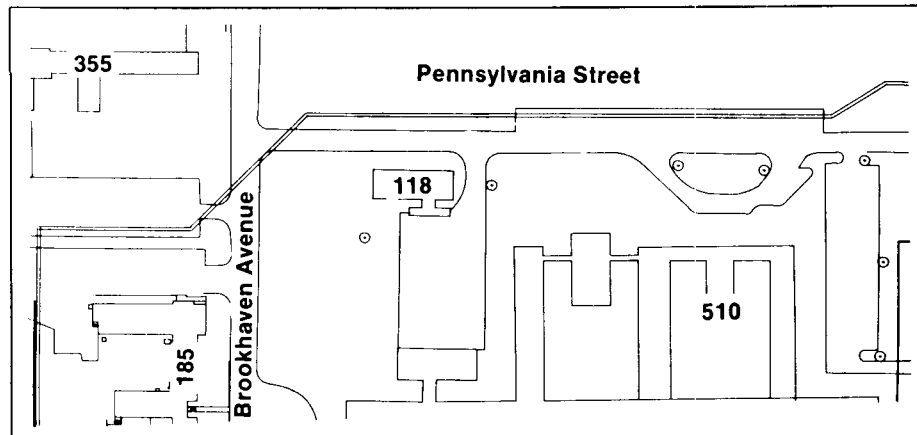
The last of 1988 saw two more teams spin out of the winning orbit due to back problems. On December 28, a back injury sidelined the Plant Engineering (PE) Custodial B Team when they were within three weeks of their second win. Also during the last week of '88, a back case knocked the Central Shops Division (CSD) Light Shop Team back to start. Let's be careful of our backs out there!

On the plus side, two more Supply & Material (SMD) Teams won their second lunch, while seven teams from PE and one team from CSD were also two-time winners. Congratulations to SMD Outlying Stores and Distribution; CSD Department Staff Shops; and PE Paint Shop, Cabinet Shop, Water & Sewage, Steam Plant, Alarm Shop, Rigging Shop, Facilities Office Assistants and Carpenter Shop.

Safety first throughout the new year, and keep up the safe work.

All film badges will be changed tomorrow. Please place your badge in its assigned rack space before leaving work today.

Detour on Brookhaven Avenue



For most of January and perhaps into February, detours will confront traffic on Brookhaven Avenue near Pennsylvania Street, and some nearby parking lots will be disrupted, as shown here. The inconvenience is a necessary evil in order to lay the pipes that will connect several buildings to the Chilled Water Facility now under construction on Rochester Street — and allow the new air conditioning systems to be operating when the heat returns to Long Island. Though access to Photography, Bldg. 118, and Physics, Bldg. 510, will be possible by entering Pennsylvania Street from the north end, signs will suggest detours, and drivers are encouraged to avoid the construction area whenever possible.

Fines to Come With Parking Tickets

Employees whose cars are found violating the Lab's parking regulations will soon have more than a yellow ticket to contend with: As of February 1, a fixed fine of \$50 will be charged against the operating funds of the offender's department or division.

Announced this week by Gerald Kinne, BNL's Assistant Director for Reactor, Safety & Security, the new parking control and enforcement program is being instituted to help alleviate difficulties in congested parking areas.

"In most instances, on-site parking should not be a problem," Kinne noted. "There are some locations, however, where space is somewhat limited and parking areas are congested. Where that is the case, it is especially important that we all obey the Laboratory's parking rules and respect the rights and privileges of others. Safety is also an important concern. Improper parking often creates a hazard for both the vehicle operator and other drivers and pedestrians as well."

This is particularly true of the areas around the Cafeteria and along Brookhaven Avenue and Center Street, which will be the program's initial enforcement zones, where the Police Group will ticket vehicles parked in prohibited areas when the program begins.

Parking is permitted on site only in areas where it does not interfere with the flow of traffic or with the movement of fire or other emergency vehicles. Parking is prohibited in designated no parking zones, which are identified by yellow markings, and in handicapped spaces, unless the appropriate permit is displayed.

Under the new program, when a vehicle parked in a prohibited space is ticketed, a copy will be sent to the offender's department or division head. The Police Group will hold the remaining copies of the citation for 30 days, to allow an appropriate period for an appeal, which will be handled by William Hempfling, Personnel Division. Without successful appeal, at the end of the waiting period, the fine will be charged to the employees' departments' or divisions' operating funds and be put into a general Laboratory fund.

Until the new program begins on February 1, the Police Group will place warning notices on vehicles illegally parked in the enforcement zones, reminding operators that they would have received a ticket if the new program had been in effect.

Weight Watchers

If your New Year's resolution is to lose those extra pounds, here's your chance: A new session of the on-site Weight Watchers workshop will begin on Wednesday, January 18, and continue every Wednesday for eight weeks, 5:15-6:15 p.m., in the conference room, Bldg. 535.

Registration takes place on Wednesday, January 11, from noon until 1 p.m. or from 5:15 to 6:15 p.m. in the lobby of Berkner Hall. The fee is \$60 for returning members, and the cost for newcomers is \$30, as the Laboratory splits the fee with them.

Inside Info

To honor the late George H. Vineyard, BNL's fourth Director, his family and friends are establishing a professorship bearing his name at the University of Missouri-Columbia (UMC). A native of Missouri, Vineyard was a faculty member in the UMC Department of Physics from 1946 to 1954, when he came to BNL. He died in February 1987.

The amount required to establish the George H. Vineyard Distinguished Professorship in Theoretical Physics is \$110,000. Contributions may be sent to the Department of Physics and Astronomy, University of Missouri-Columbia, 223 Physics Building, Columbia MO 65211. For more information, call the Department of Physics, (314) 882-5502.

Addled Addresses

- Brookhaven National Lab
- Brookhaven National Laboratory.
- Brookhaven National Laboratory Lipton, New York
- Brookhaven Nail LAB
- H. Hughes Med-Inst/Brookhaven Nat Lab
- Brookhaven Ntl Labs 1-1/2 Mi N of Long Island Expw Upton, NY
- The Incharge Brookhaven National Lab
- Associated Diversities Corp.

Fermi Award

(cont'd)

come to BNL's Biology Department, where he was named Chairman in 1979. Since 1986, he has served as Associate Director for Life Sciences.

Even during these years in administration, he has vigorously continued his trailblazing work. At present, he is involved in research with fish, which has shown that dimers in certain species can give rise to tumors, including melanomas. In a long-term, joint Biology/Medical Department project, he is looking at cell strains, including cells from BNL volunteers, to see how effective they are at DNA repair.

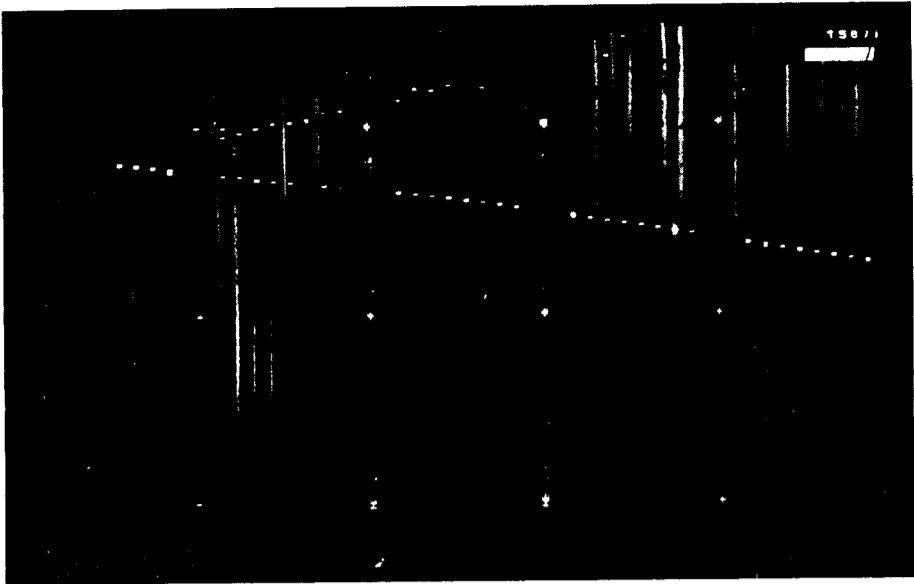
Setlow's body of work has stimulated a veritable explosion of research activity that has led to the discovery of other DNA repair mechanisms, not only in bacteria, but in all organisms, including humans. Scientists now believe that the genetic stability of cells is maintained by a variety of intricate biochemical mechanisms, among which DNA repair plays a central role as one of the three R's — replication, recombination, and repair.

In addition, certain genetic diseases in humans are the result of inherited deficiencies in DNA repair. Thus, Setlow's original discoveries laid the foundation for what has become one of the more fruitful, far-reaching and intellectually important areas of modern biology and medicine.

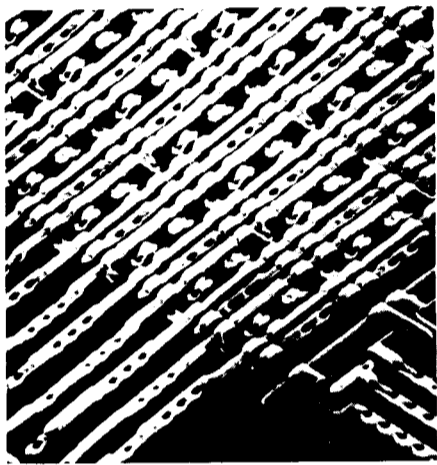
Setlow has served on various advisory boards to the National Academy of Sciences, the Office of Technology Assessment and the Food and Drug Administration. He has also been president of both the Biophysical Society and the Comité International de Photobiologie.

AA Meetings

Alcoholics Anonymous (AA) meetings are being held at the Lab every Monday at 5:30 p.m. All employees, others with current BNL identification cards and their spouses are invited to participate. To find out the meeting location, call the Employee Assistance Program, Ext. 2733. Participation in AA is confidential, so you will not be asked to identify yourself when placing the call.



The long, straight track photographed in the spark chamber of the Nobel Prize-winning 1962 experiment at the AGS is that of a muon created by an incident neutrino. The existence of the muon-neutrino was inferred when only muons were detected in the spark chamber. Had a combination of electrons and muons been seen, they would have been produced by the previously known electron-neutrino.

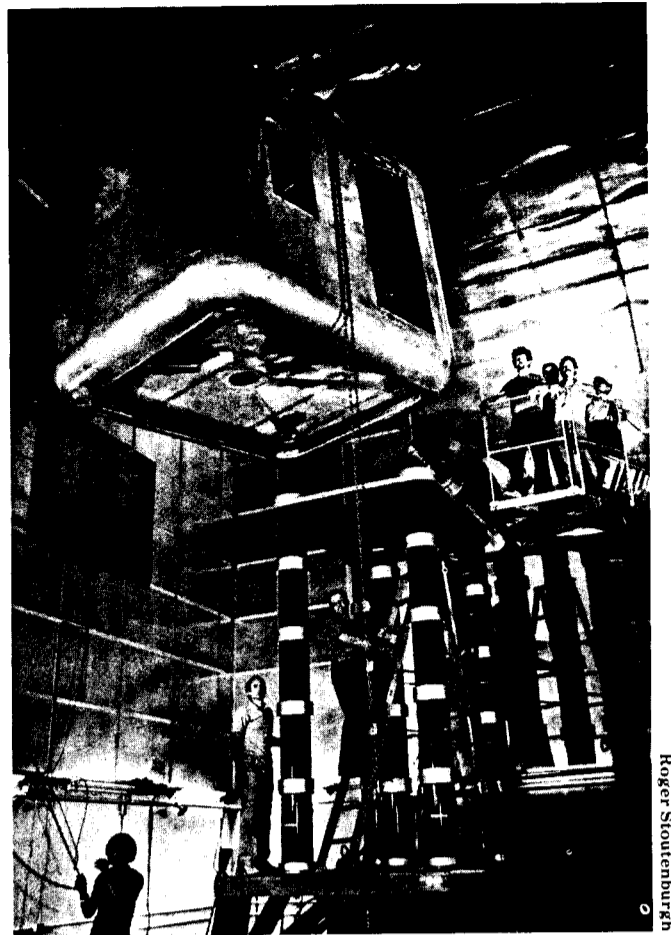


Made by IBM at the NSLS, this is one of the world's most tightly packed, working computer chips. Transistors are buried beneath the metal connection lines, which are less than one micron wide and connect the transistors at the small, dark circles, 0.5 microns in diameter.



"Wall-walking" was a required exercise at a Special Response Team Training session held in May for the Lab's Police Group and members of Suffolk County Emergency Services. Also held on site in 1988 were training programs in such areas as digital electronics, personal computers and the safe removal of asbestos.

Twenty-nine years after accelerating its first proton beam for the AGS, the Cockcroft-Walton pre-accelerator was disassembled, beginning in June, to make room for its state-of-the-art replacement—a radiofrequency quadrupole, or RFQ, one of four major upgrades completed during the AGS's scheduled shut-down this year.



Roger Stoutenburgh

High Points — 1988

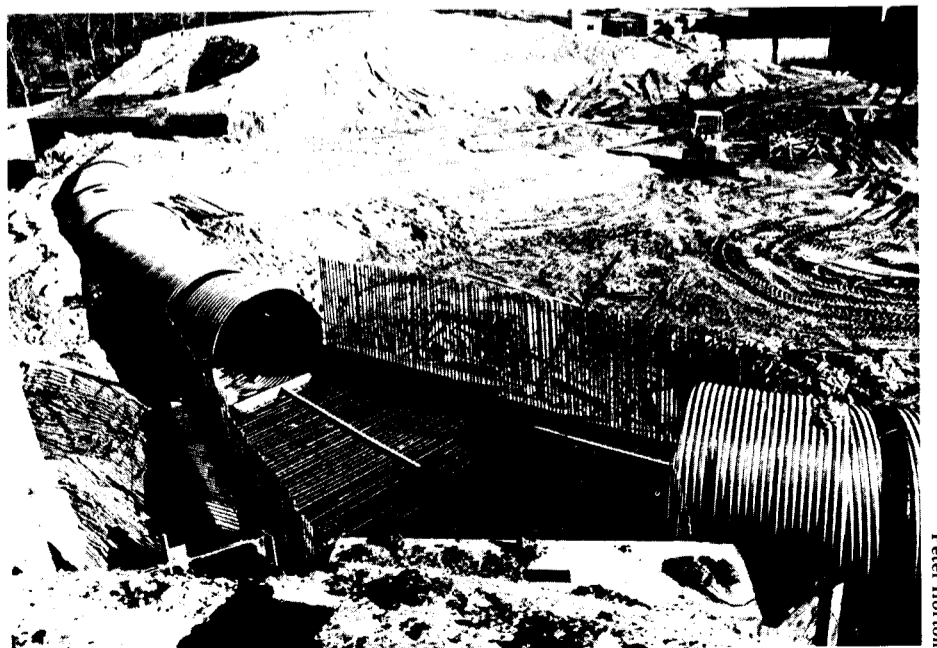
Awards accounted for several high points in 1988, as BNL staff members captured the Department of Energy's (DOE) Fermi Award (see story, page 1) in December and three R&D 100 awards in September. In October, the number of Nobel Prizes awarded for research done at BNL's Alternating Gradient Synchrotron (AGS) rose to three, when former AGS users Leon Lederman, Melvin Schwarz and Jack Steinberger shared the honor for their 1962 discovery of the muon-neutrino.

To assure continued forefront research, 1988 saw extensive improvements to both the NSLS x-ray ring and the AGS. After an April ground breaking, construction went forward on the Accumulator-Booster, which will further enhance the AGS program while opening the way for the Lab's proposed Relativistic Heavy Ion Collider (RHIC). Other good news for RHIC came in February, when the Tandem Van de Graaff, which injects heavy ions into the AGS, produced a gold beam even more intense than that needed to meet RHIC's specifications, and in May, when the first RHIC superconducting quadrupole magnet passed its tests with flying colors.

At other BNL facilities, DOE recommended in June that needed improvements to HFBR instrumentation be implemented; work began on an Accelerator Test Facility to validate advanced concepts for accelerators; and users of the Positron Emission Tomography (PET) facility welcomed a new whole-body PET machine in June.

In July, the IBM Corporation announced that a team working at the NSLS' ultraviolet ring had used x-ray lithography to produce some of the most densely packed computer chips in the world. To help further such technology, in June, BNL had received initial funding from a five-year, \$21 million grant to develop a superconducting x-ray lithography source. Ultimately, the final technology will be transferred to industry.

Other 1988 high points included BNL's June participation in an Illinois-based field experiment to study the phenomenon of acid rain through the chemistry and physics of thunderstorms in a polluted environment; the May dedication of the Neutral Beam Test Facility; and the Technical Service Organization's September celebration of its 20th anniversary.



Peter Horton

Conventional construction for the Booster Project began in March. By December, the entire tunnel enclosure had been completed and work had begun on concrete structures that will tie the Booster to existing facilities.

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**In Stormy Weather:
Dial 282-INFO**

Update Your ID Card

Employees and guests — check your wallets. Has your BNL identification card expired? If so, please renew your card at Police Headquarters, Bldg. 50, 9:30-11 a.m., Mondays, Wednesdays and Fridays. For more information, call Hank Raimondo, Ext. 7258.

