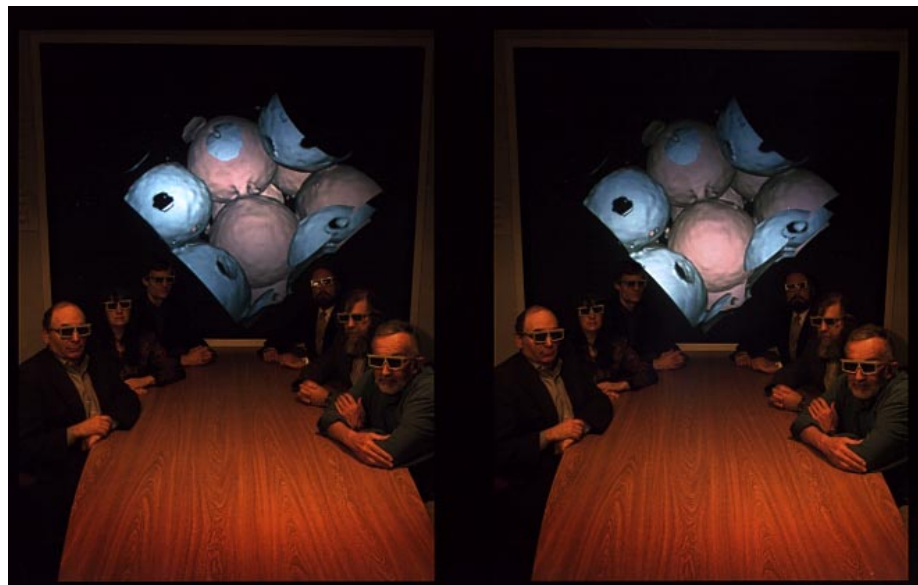


CCD in 3-D: 'Fantastic Voyage'



Roger Stoutenburg

Can you see in 3-D? Even though the Bulletin can't print images in three dimensions, you may be able to see these two 2-D images in 3-D if you bring this page near your eyes, unfocus your gaze while staring at the large projected objects behind the people, slowly pull the page away and let the two images become one. The result should be an eye-fooler: a 3-D view of a magnified image projected on the screen in the Computing & Communications Division's (CCD) visualization facility. The image of the 0.1-millimeter glass balls on the screen was made on a beam line at the National Synchrotron Light Source (NSLS), converted into a computer file, split into stereo images, and projected in magnified form using the facility's special equipment. Sitting in front of the screen, wearing their 3-D polarized glasses to allow them to see the image in true 3-D, are the facility's originators: (clockwise from left) Arnold Peskin, CCD; Betsy Dowd, NSLS; Ballard Andrews, CCD; Ted Daniels, CCD; Peter Siddons, NSLS; and Keith Jones, Department of Applied Science. For the full story on CCD's new facility, see page 2.

AUI Distinguished Lecture

Nobelist Martin Perl to Discuss Craft and Art in Science

Martin Perl won the 1995 Nobel Prize in Physics for his discovery of the tau lepton, a subatomic particle that proved the existence of a third family of building blocks for matter and helped to validate the standard model, the theoretical model for understanding the properties of matter.

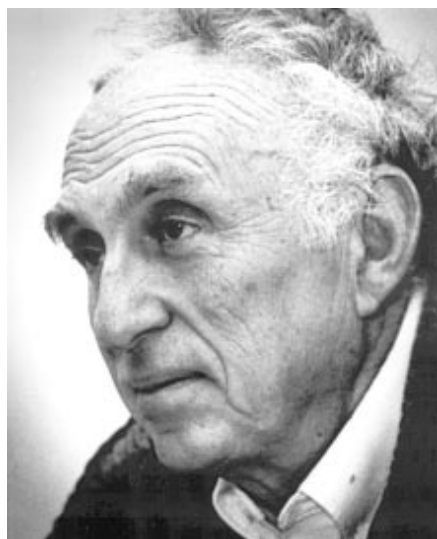
In a memoir on the particle's discovery, Perl reflects on the scientific problems he had to overcome, as well as the emotions that he had to grapple with in doing experimental work over the course of his career.

"In my thesis experiment," Perl explains, "I first experienced the pleasures, the anxieties, and sometimes the pain that is inherent in experimental work: the pleasure when an experiment is completed and the data safely recorded, the anxiety when an experiment does not work well or breaks, the pain when an experiment fails or when an experimenter does something stupid . . . in the discovery of the tau, the ups and downs of my emotions extended over years."

In an AUI Distinguished Lecture on Tuesday, May 14, at 4:30 p.m. in Berkner Hall, Perl will reflect on the emotional aspects of science, which are almost always omitted from discussions of the experimental method. His lecture is titled "Craft and Art in Experimental Science."

A sampling of Perl's intriguing topics include: the experimenter's personality and choice of experiments, denial of anxiety in experimental work, use and misuse of obsession in experimental work, theorists as comrades and dictators, and why it is so hard to get a good idea for an experiment.

Perl earned his B.S. in chemical engineering from the Polytechnic Institute of Brooklyn in 1948, and his



Martin Perl

Ph.D. in physics from Columbia University in 1955, where his thesis advisor was the late I.I. Rabi, the Nobel Prize winner who helped to found BNL.

Soon after, Perl started his career in physics at the University of Michigan, and, from February through September 1956, he joined BNL as a research collaborator and visiting assistant physicist. He kept his guest status at the Lab on and off until 1970.

In 1963, Perl joined Stanford University as Professor and Group Leader at the Stanford Linear Accelerator Center. Today, he also chairs the High Energy Physics faculty at Stanford. In addition, he is Chief Financial Officer of The Invention Company in San Francisco, a business that manufactures educational toys and art materials.

Perl had discovered the tau lepton some 20 years before he won the Nobel Prize. In 1982, he was awarded the Wolf Prize in Physics, also for that discovery. — Diane Greenberg

Robert Hughes to Step Down From AUI Presidency

In October 1996, Robert Hughes will have served as President of Associated Universities, Inc. (AUI), for 16 years. Recently, Hughes informed the AUI Board of Trustees that he is prepared to retire from that position as soon as a successor can be appointed.

Thus, the AUI Board recently established a search committee to undertake a formal, nationwide search for potential candidates for the presidency.

Chaired by AUI Trustee John Armstrong, the ten-member search committee also includes, in addition to other Trustees, Denis McWhan, BNL's Associate Director for Basic Energy Sciences; Robert Brown, Associate Director of the National Radio Astronomy Observatory (NRAO); and two members from the scientific community at large. Correspondence to the committee can be addressed to: John Armstrong, c/o AUI, 1400 Sixteenth Street, N.W., Suite 730, Washington, D.C. 20036-2217.

The AUI President, who serves as a Trustee *ex officio*, is concerned not only with overseeing the management of Brookhaven National Laboratory for the U.S. Department of Energy, but also with overseeing the management of NRAO, Brookhaven's "sister" laboratory, for the National Science Foundation (NSF). The AUI President also manages AUI corporate affairs at AUI headquarters in Washington, D.C., and serves as a focal point for all

activities of the Board of Trustees.

Said Ernest Henley, University of Washington, Chairman of AUI's Board of Trustees, "Bob Hughes has been a great AUI President, with hands-on interest in all of the affairs of the two laboratories. He has worked with DOE and NSF effectively and with great finesse."

Hughes returned the compliment: "The heart of AUI lies in the Board of Trustees," he observed. "For the past half-century, the Board has provided the spirit, the sense of purpose and the (continued on page 2)



Robert Hughes

Roger Stoutenburg

Brookhaven Lecture

Cleaning Up Rad Waste — They Do It With Microbes!

Getting rid of low-level waste — waste containing only very small amounts of radionuclides and toxic metals — used to be a simple matter of burying it in an out-of-the-way place.

Then, it was discovered that anaerobic microorganisms, which grow in the soil without oxygen, were acting on the waste, changing the insoluble forms of toxic metals into soluble forms, which can leak into soil and groundwater. The problem is nationwide, affecting wastes disposed of from industrial facilities, mines, incinerators and U.S. Department of Energy (DOE) sites.

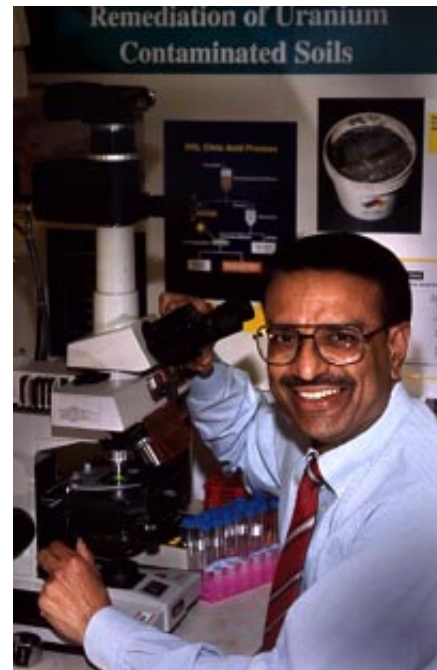
So, back in 1976, first funded by the Nuclear Regulatory Commission and later by DOE's Office of Health & Environmental Research, BNL scientists began collecting samples from low-level radioactive waste burial sites at Maxey Flats, Kentucky; West Valley, New York; and Barnwell, South Carolina. By isolating and studying microorganisms in the samples, the researchers hoped to understand the basic mecha-

nisms involved and use them to control leaching of radionuclides, toxic metals and organic contaminants, as well as to design a system to clean up the contaminated sites.

They have succeeded: Already, the new technology they have developed has produced a Cooperative Research and Development Agreement with a firm wanting to use the BNL methods to decontaminate municipal incinerator ash.

To tell the exciting story of the team's work, Microbiologist A.J. Francis will give the 316th Brookhaven Lecture on Wednesday, May 15. Group Leader for the Microbiology Group in the Biosystems and Process Sciences Division in the Department of Applied Science (DAS), Francis will talk on "Harnessing Microbes to Clean Up Radioactive Waste," beginning at 4 p.m. in Berkner Hall. He will be introduced by DAS Chairman James Davenport.

Francis will relate how his team's years of basic research produced, in (continued on page 2)



A.J. Francis

Roger Stoutenburg

CCD in 3-D: New Facility Allows 'Fantastic Voyage' Through Molecules, Materials, MRIs & Machines

When Hollywood took film-goers on a tour of the human body in *Fantastic Voyage*, it was movie magic that created the blood vessels and organs that the miniature voyagers saw in their travels.

But imagine if the movie's scenery had been images of actual human tissue, not special effects. And what if it had been filmed and shown in three dimensions, rather than the two-dimensional flatness of the traditional movie screen?

The result might have been something like what scientists are now seeing in BNL's new computerized 3-D visualization facility.

Here, on the first floor of the Computing & Communications Division (CCD) building, the tiny channels between molecules become as navigable as rivers and roads. The intricacies of a complex collider detector become apparent before the machine is even built.

Here, too, digitized slices of human brain or porous rock — images produced by successive scans at BNL's scientific machines — can be combined to make the original object "whole" again inside a high-powered computer.

Then, through the use of special glasses, projectors and screens, BNL scientists and users from all fields can take fantastic voyages of their own through the molecules, materials, medical images and machines they study.

With a nearly endless list of possible applications, the 3-D "theater" is set to become a close companion to many of Brookhaven's other user facilities. Data taken at places like the National Synchrotron Light Source (NSLS) and the Center for Imaging and Neurosciences can be taken from a computer screen to a movie screen and seen in such vivid color and dimension that they seem to fill the space in front of a viewer's eyes.

A Team Vision Becomes Reality

The visualization facility was turned from vision to reality through the cooperation of BNL, the U.S. Department of Energy (DOE), and private companies, including Mobil and Gen-

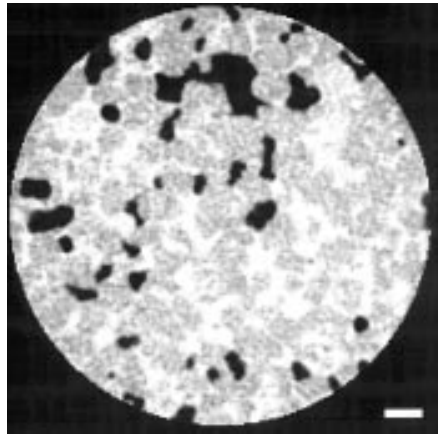
eral Telephone & Electronics (GTE).

It was originally conceived for Mobil researchers who use x-rays from BNL's NSLS to probe rock samples for clues to untapped oil reserves.

The tomography technique they use can only produce slice-by-slice images of rock samples, making it hard to predict which rocks have interconnected pores that can be tapped for oil and which are full of dead ends.

Mobil had been working with Keith Jones, Department of Applied Science, and his colleagues for several years on computed tomography techniques to "reconstruct" the original whole rock inside a computer.

After seeing a GTE demonstration on 3-D visualization equipment, the team saw that it might be possible to "fly" through the reconstructed rock



A computed tomography slice image of porous oil-reservoir rock, made by Mobil researchers at the National Synchrotron Light Source. Using the 3-D visualization facility, many such images can be combined in a computer to make the rock "whole," easing the search for new oil fields.

using computers and 3-D projection technology. This would make it even easier to see the pore structure and the potential for oil retrieval.

The researchers turned to Dorry Tooker of BNL's Office of Technology Transfer, and, in turn, to BNL scientists Arnold Peskin and Ballard Andrews of CCD and Betsy Dowd and Peter Siddons at the NSLS.

The team received \$359,000 in research funds from DOE's Advanced Computational Technology Initiative

Robert Hughes (cont'd.)

broad guidance that has infused and stimulated its daughter institutions.

"This remarkable Board has continually attracted and maintained the interest and commitment of truly eminent scientists and science administrators who serve *pro bono*, often for many years," Hughes continued. "The exemplar I.I. Rabi, one of the AUI founders, devoted about 40 years of his life to AUI/BNL/NRAO. The uniqueness of this Board is nationally recognized. With the distinguished Visiting Committees it establishes, it provides powerful links to the world of science."

"In retrospect," added Hughes, "I sometimes find it difficult to believe that, upon retirement, I will have been president of AUI for essentially one-third of the existence of BNL and 40 percent of the life of NRAO. What has made it so satisfying is that it has been a period of challenge, excitement, growth and achievement for both institutions."

During his tenure as AUI President, Hughes has seen BNL honored with two of the four Nobel Prizes that scientists have won for work done at the Lab. This was a period when BNL

(ACTI), a program to improve the competitiveness of America's natural gas and oil companies by teaming them with computational scientists at DOE labs such as Brookhaven.

3-D Theater of Science

The result of this cooperative research is a facility that is unique in many respects.

By combining commercially available technology with specially developed software in a novel way, the facility has become a place where scientific data and images can be transformed from two dimensions to three and from static to interactive.

It all starts with a scientist's data, such as the tomography data from Mobil's NSLS beam line, and a powerful graphics-oriented Silicon Graphics Onyx "reality station" computer. Using software written or adapted in CCD, the Onyx analyzes the data and allows the image — be it a protein's atomic structure or the Mobil researchers' rock — to be redrawn quickly whenever the user manipulates it.

The next step is to transfer the image to a 3-D projector, or, rather, pair of projectors positioned behind a special screen. Each projector receives the computerized image and projects it through special filters onto the three-meter screen in polarized light.

This means that someone watching the front of the screen without special 3-D glasses will see a double image. So, in order to make the pair of two-dimensional images seem three-dimensional, viewers need to don special glasses with polarized lenses. These fool the eye into combining the stereo images into a 3-D whole that seems to leap off the screen.

So far, the Mobil researchers have steered their way through several of their computed-tomography rock images, while Andrews has converted everything from engineering diagrams to protein structures into the proper formats for 3-D viewing.

It may even become possible, through high-speed data links now in place or being laid, to locate such 3-D theaters in remote locations and feed data from the central reality station for viewing thousands of miles away. It's a vision that's still around the corner, but, with this facility, vision counts. — Kara Villamil

made a remarkable transition from the closure of the Colliding Beam Accelerator project to the current dynamic era of construction and planning for science at the Relativistic Heavy Ion Collider.

The NRAO, over those years, completed the Very Large Array near Socorro, New Mexico, and the Very Long Baseline Array, a string of ten radio telescopes that extends from Hawaii to St. Croix — two extraordinarily powerful instruments that will soon be complemented by the Green Bank Telescope, a 100-meter behemoth in West Virginia.

When Hughes took the full-time position of AUI President in 1980, he was Professor of Chemistry at Cornell University, one of the nine universities that founded AUI in 1946, and where he had earned his Ph.D. in chemistry in 1952, then continued as a chemistry instructor for a year. Hughes had taken his B.S. in engineering chemistry at Lehigh University in 1949.

In 1953, Hughes joined the Chemistry Department at the University of Pennsylvania as an assistant professor, becoming a full professor before he returned to Cornell in 1964, as

Wanted: Users With Vision

To learn more about the ACTI project and BNL's 3-D visualization theater (see story at left), as well as groupware, come to CCD's Monthly Information eXchange (MIX) meeting on Wednesday, May 15, at 11 a.m. in Berkner Hall, Room B. You can learn more about how you might be able to use the facility and arrange for tours and demonstrations there.

BNL Lecture (cont'd.)

1994, a new, patented process that uses citric acid, microbes and sunlight to recover not only toxic metals such as cadmium, nickel, lead, strontium and zinc, but also the radionuclides thorium and uranium, from soil and other materials.

From Annamalai University, India, Francis received his B.Sc. in agriculture in 1963 and his M.Sc. in soil microbiology in 1965. After earning his Ph.D. in microbiology from Cornell University in 1971, he remained at Cornell as a research associate from 1970-73, then moved to Stanford Research Institute for two years as a microbiologist. Joining BNL's DAS in 1975 as an assistant microbiologist, he became an associate microbiologist in 1977 and was named Microbiologist in 1980.

Francis holds two patents in microbiological remediation with Cleveland Dodge and Jeff Gillow, DAS, and two more in the same area with Dodge and other colleagues. An adjunct professor at the State University of New York at Stony Brook, Francis collaborates with Sandia National Laboratory's Waste Isolation Pilot Plant Program and has been actively involved with the European group MIND — Microbiology in Nuclear Waste Disposal — as well as with the United Nations Development Program and the International Atomic Energy Agency Technical Committee on advanced technologies for treating low-level radioactive liquid waste.

After the lecture, all are invited to join Francis for discussion and refreshments. Those wishing to have dinner with the speaker at a restaurant off site may call Corinne Messana, Ext. 7398. — Liz Seubert

Note to Employees:

Attendance at lectures, meetings and other special programs held during normal working hours is subject to supervisory concurrence.

Coming Up: Malcolm Browne At NSLS Meeting

Malcolm Browne, Pulitzer Prize winner and senior writer in the Science News Department of *The New York Times*, will be the keynote speaker at the 1996 Annual Users' Meeting of the National Synchrotron Light Source (NSLS), on Tuesday, May 21. His talk on "Lamplighters and Tool Makers" will begin at 9 a.m. in Berkner Hall. All are welcome.

Employees are also welcome to visit the equipment exhibit that will be set up in Berkner Hall on May 21.

Workshops on topics related to experimentation at the NSLS will be conducted on the days before and after the meeting, Monday and Wednesday, May 20 & 22.

For details about the workshops, check the Weekly Calendar for the week of May 13. The meeting's agenda will be found on the reverse side.

For more information, call the NSLS Users Administration Office, Ext. 5763. To register, contact your department chair or division head.

Professor of Chemistry. He served as Director of the Cornell Materials Science Center, 1968-74.

In 1974, then President Gerald Ford appointed Hughes as Assistant Director for National and International Programs of the NSF. With the NSF's reorganization in 1975, he became Assistant Director for Astronomical, Atmospheric, Earth and Ocean Sciences, until he returned to Cornell in January 1977.

Looking back, Hughes reflected, "Apart from three years each in the Army and industry, and five years devoted to obtaining a B.S. and Ph.D., my entire career has been shaped in three outstanding organizations, with 10 years as a professor at the University of Pennsylvania, 18 more at Cornell University, and now 16 at AUI. I cannot imagine being associated with any finer institutions or livelier, more committed colleagues."

Now, said Hughes, "I hope to remain in association with AUI for some time, as did my predecessor Gerald Tape. I also intend to undertake a number of other professional projects that have been long deferred." — Anita Cohen

BNL Daughters Join Their Parents In the Workplace for a Day



Mark McNeill, a technical specialist at the Alternating Gradient Synchrotron (AGS), brought his three daughters — (clockwise from left) Beth, 15; Lisa, 14; and Erin, 9 — to work with him in the AGS main control room. As McNeill points out the intricacies of the control panel, (background) BNL photographer Roger Stoutenburgh and his nine-year-old daughter Chelsea Marie, shoot this family portrait.

The Lab's population grew by almost 200 on Thursday, April 25, as the nine-to-15-year-old daughters of many BNLers reported to work with their parents — to participate in the Lab's second consecutive Take Our Daughters to Work Day.

In organizing the day, Susan Foster, Human Resources Division, paid attention to comments from last year's participants. "The girls wanted more time in their parents' workplaces, so this year the whole morning was devoted to that," she explained. "Then, to help them let off a little energy at lunchtime, we had Frisbees, hula hoops, volleyball and other activities available to them at the Brookhaven Center, where they had a box lunch with their parents, thanks to the generosity of Associated Universities, Inc."

After lunch, the older girls went by bus to visit several areas on site: the Alternating Gradient Synchrotron, the National Synchrotron Light Source, the Relativistic Heavy Ion Collider, the Firehouse and the National Weather Service. The younger girls also visited the Science Museum.

"I think it was a good day," summed up Foster. "The girls saw a lot of things that they didn't see last year, so it wasn't too repetitive for them."



Roger Stoutenburgh

Physicist Lorraine Solomon, National Synchrotron Light Source Department, shows her daughter Naomi Ocko, 11, the cryostat for the superconducting magnet for the harmonic generation experiment, which Solomon is working on for the Accelerator Test Facility. Naomi also spent some time that day with her father, Physicist Ben Ocko, Physics Department.

Vending Machines: New Contract Helps the Blind

Effective Friday, May 3, the permit to operate most of the vending machines at BNL passed to J&A Automatic Services, a subcontractor of the New York State Commission for the Blind (NYSCB).

Tim Sy of the NYSCB, who visited the Lab that Friday to help oversee the changeover, explained that the Randolph Shepherd Act of 1974 enabled the commission to set up the Business Enterprise Program to help legally blind people find job opportunities. Through this program, the commission now holds permits for 125 facilities statewide, including cafeterias, convenience stores and vending

machine outlets, that are run mostly by the legally blind.

However, at certain sites such as BNL's, Sy said, setting up a widespread vending machine facility is impracticable for anyone who is blind. Therefore, the commission occasionally subcontracts to non-blind operators for a fee that is used to buy equipment for other facilities, which are operated by legally blind managers, as well as to pay for their hospitalization and retirement benefits.

"The new agreement provides for a winning arrangement for all involved," said Kenneth Mohring, Administrative Support Division, who is respon-

sible for overseeing the new contract and changeover. "The commission receives funds for its program, and customers will receive enhanced services and know that a portion of the purchase price will help others."

The cold food vending machines in the Post Office, Bldg. 179; the Alternating Gradient Synchrotron, Bldg. 912B; and at the back of the National Synchrotron Light Source, Bldg. 725; will be serviced by Flik International Corp., the Lab's new food service contractor.

All other vending machines are now operated by J&A Automatic, which is keeping the inevitable interruptions in service to the minimum during the changeover. To contact J&A about a malfunctioning machine, call the number provided on it: (800) 427-0080.

— Liz Seubert



Wednesday, May 15
11:30 a.m. to 1:30 p.m.

in the parking lot opposite Berkner Hall,
between the tennis courts
and the Science Education Center

Arrivals & Departures

Arrivals

Kathryn M. Clifford...Saf. & Envir. Prot.
Alexei V. Fedorov.....Physics
Christopher C. Klassert.....RHIC
Edward L. Nicolescu.....RHIC

Departures

This list includes all employees who have terminated from the Lab, including retirees:
Fan Zhu.....Physics

Archery Club

The BNL Archery Club will host an open-house fun shoot, on Thursday, May 16, at 5 p.m. at the archery range. The rain date is Thursday, May 23. Everyone interested in archery, whether or not you are a member, is invited to attend. Bring your appetite too, as a barbecue is included.

RSVP to Bill Schoenig, Ext. 2377, by Tuesday, May 14, if you plan to attend.

PC Training

Seats remain in the following June classes offered by the Computing & Communications Division (CCD):

Date	Class	Fee
June 4&6	int. ACCESS	\$300
June 12	basic Windows	\$150
June 13	beg. WordPerfect for Windows	\$150
June 18&19	beg. ACCESS	\$300
June 21	int. Word Perfect for Windows	\$150
June 26	beg. PowerPoint	\$150

Classes meet from 9 a.m. to 4 p.m. in the PC Training Room, M1-57, in Bldg. 515, CCD. Please note that the revised training fee is \$150 per day and is retroactive to October 1, 1995. To register, contact your department or division training coordinator, or call Pam Mansfield, Ext. 7286.

Weight Watchers

Registration for the next on-site, lunchtime Weight Watchers series will be held on Wednesday, May 15, from noon to 1 p.m. in the South Dining Room of the Brookhaven Center. In its approach to weight management, Weight Watchers offers a nutritious food plan, an activity plan and a behavioral support plan. Starting on May 22, the class will meet on Wednesday for eight to ten weeks, depending upon the number of people who sign up.

For more information, call Mary Wood, Ext. 5923.

Healthline Lecture: Laser Eye Surgery

The laser may be used for surgery on many parts of the eye and has been helpful in treating many different types of eye diseases. Ophthalmic laser surgery has been so successful, in fact, that it is heralded as one of the most important developments in ophthalmology over the past decade.

To discuss this advance and the different types of lasers used for different conditions, ophthalmologist Charles Bloomgarden will present the next Healthline lecture. Sponsored by the Health Promotion Program (HPP) of the Occupational Medicine Program, "Lasers in Ophthalmology" will be given on Wednesday, May 15, from noon to 1 p.m. in Berkner Hall. All are invited, and the talk will be available

afterwards on audiocassette in the Research Library, Bldg. 477.

Charles Bloomgarden, M.D., is certified by the American Board of Ophthalmology. He is a fellow of the American Academy of Ophthalmology & Otolaryngology and the American College of Surgeons. Bloomgarden has a private practice in Commack and Huntington, and he serves as an instructor in the Department of Medicine at Stony Brook Medical Center.

To register, complete and return the bottom portion of the Healthline flyer recently sent to all employees to Health Promotion Specialist Mary Wood by Tuesday, May 14. For more information about HPP and its Healthline lecture series, call Ext. 5923.

Tonight: BNL/FBI Training Exercise

Today, from 5 p.m. through midnight, the BNL Police Group and the Federal Bureau of Investigation (FBI), will conduct a joint training exercise, which could involve flashing lights, people in uniform carrying replica weapons, sirens and gunshots, but no live ammunition.

The drill will take place in the areas of Railroad Avenue by the warehouses, the cottages in the apartment area, and the North and South Rooms of the Brookhaven Center, Bldg. 30. The rest of the Center will be open for employees' usual evening use.

Those who are not involved in the drill are asked to stay out of the training areas during the seven hours of the operation. Those who must enter any of those areas should first call BNL Police Headquarters, Ext. 2238, so a BNL patrol officer may assist in gaining access.

For more information, call Police Captain Michael Delph, Ext. 4968.

Bowling

Red & Green League

R. Raynis 263/232/647 scratch series, K. Koebel 245/201/634 scratch, S. Frei 220/212/619 scratch, J. Griffin 258/614 scratch, R. Mulderig Jr. 244/616 scratch, T. Prach 222, R. Mulderig Sr. 216, H. Arnesen 215, J. Cuccia 213, K. Riker 205, D. Fisher 204, B. Geib 203, E. Meier 202.

White & Purple League

G. Mehl 255/217/617 scratch series, A. Pinelli 214/202, M. DiMaiuta 194/189, P. Callegari 187/182, R. Picinich 235, J. McCarthy 231, A. Almasy 215, S. DiMaiuta 210, R. Wiseman 201, E. Sperry IV 200, Doug Fisher 199, J. Meier 183, D. Klein 181, M. Addressi 174, M. Picinich 171, D. Klein converted the 4/7/9 split.

BROOKHAVEN BULLETIN

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Glorious & Crazy: Art & Castle Bus Trip

Steep yourself in the glorious, crazy past on the Art Society's Saturday, June 29, bus trip to Connecticut.

After a coffee stop, see 18th-century Bush-Holley farmhouse near Greenwich, with period furnishings and pictures by American Impressionist artists, including Childe Hassam and John Twachtman, who lodged there early in this century. Lunch at

the reasonably cute little village of Chester, highly convenient for crossing the Connecticut River to wend up through woods to one-of-a-kind Gillette Castle, built for superb cliff-top views by eccentric millionaire William Gillette, who was mad about turrets, innovative door latches, sprinkler systems — and Sherlock Holmes.

The bus will leave BNL's tennis-court parking lot at 6:45 a.m. (agony to get up so early, but worth it) and return around 9:30 p.m., with a speed-food stop on the way back. The cost of \$30 per person covers bus-with-bathroom and both museums. Call Liz Seubert, Ext. 2346 or 286-8563, evenings, for reservations.



Aerobic Dance Club

With spring softball and summer swimsuit seasons almost here, now's the time to sign up for BERA aerobic dance and stretch classes. Aerobics are held in the Recreation Building in the apartment area on Tuesdays and Thursdays at 5:15 p.m. Wednesday stretch classes are in the Physics lounge, Bldg. 510, at 5:15 p.m..

The cost is \$35 for each 11-class session, or \$4 per class on a pay-as-you-go basis. All levels are welcome. For more information, call Pat Flood, Ext. 7886, or Kara Villamil, Ext. 5658.

Atlantic City Trip

The next BERA-sponsored, one-day trip to Atlantic City will be to Trump Castle Hotel and Casino on the marina, on Saturday, July 13. The initial cost will be \$22, but the hotel-casino will give a coin package and deferred coupon.

The bus will leave the Brookhaven Center at 8 a.m., with an extra pickup at LIE Exit 63, if requested. After a seven-hour stay in Atlantic City, return will be about 11 p.m.

Buy tickets now at the BERA Sales Office in Berkner Hall, weekdays, 9 a.m. to 1:30 p.m. For more information, call Andrea Dehler, Ext. 3347, or M. Kay Dellimore, Ext. 2873.

Classified Advertisements

Placement Notices

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

Each week, the Human Resources Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Human Resources, and second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (344-7744), for a complete listing of all openings.

Current job openings can also be accessed via the BNL Home Page on the World Wide Web. Outside users should open "http://www.bnl.gov/bnl.html", then select "Scientific Personnel Office" for scientific staff openings or "Employment Opportunities" or "BNL Human Resources Division" for all other vacancies.

SCIENTIFIC RECRUITMENT - Doctorate usually required. Candidates may apply directly to the department representative named.

SCIENTIST - To serve as the Head of the RHIC Computing Facility, with several years of research experience in the fields of particle or nuclear physics, including responsibility for computer applications. Candidates with experience in managing a large scientific group will be preferred. The computing facility is expected to grow to a processing power of approximately 200 gigaflops, handling 500 terabytes of data per year by early 1999. A staff of about 35 scientists, computing professionals and support personnel is planned. The Head will have responsibility for directing the development, growth and operation of the new facility, as well as articulating the computing needs and directions for this important segment of nuclear science research. Contact: Thomas Ludlam, RHIC Project.

POSTDOCTORAL RESEARCH ASSOCIATE - Trained in theoretical physics, with experience in many-body theory as applied to condensed-matter physics. Program involves applications of theory of correlated electron systems to high-temperature superconductors, magnetism, structural phase transitions and other current problems in condensed matter physics. Candidates who have experience interacting with experimentalists will be preferred. Contact: V. J. Emery, Physics Department.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

NS 4702. ADMINISTRATIVE POSITION - Requires a bachelor's degree in business, accounting or finance, substantial relevant experience, preferably in a large accounting or financial organization, and knowledge of BNL practices, policies and procedures; CPA status a plus. Responsibilities include analyzing current practices, planning, evaluating and recommending improvements to these practices and overseeing the resources required to implement the changes. Financial Services Division.

DD 5578. TELEPHONE OPERATOR - (substitute) Will be on call to assist in placing calls and other related telephone duties. Computing & Communications Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

NS 5580. TECHNICAL POSITION - (temporary) Requires a BSCS or equivalent experience in problem resolution for users of Windows, DOS and Macintosh operating-system environments. Applications support for MS Office Suite, dBase and Harvard Graphics, with working knowledge of the WWW, networking and communications packages desirable. Responsibilities include working as part of a team that provides help desk and consulting support for PC and Macintosh computer users, and organizing and conducting tutorials and workshops. Computing & Communications Division.

DD 4515. TECHNICAL POSITION - Requires a BSET or equivalent, a thorough knowledge of digital logic concepts, familiarity with various test equipment, and the ability to work from schematics, rough sketches and verbal instructions. Familiarity with high-speed analog circuitry and rf techniques is desirable. Responsibilities include construction of prototypes through final testing and installation. National Synchrotron Light Source Department.

DD 4516. TECHNICAL POSITION - Requires a BSET or equivalent work experience, and familiarity with the use of hand tools and the skills used for assembling and wiring electrical chassis. Must be able to work from prints and oral instructions, and provide assistance to engineers in such areas as data collection, breadboarding and troubleshooting. National Synchrotron Light Source Department.

DD 4517. TECHNICAL POSITION - Requires a BSET, with emphasis in analog and digital circuitry. Familiarity with test equipment, such as oscilloscopes, network analyzers, synthesizers, etc., is useful. Willingness to work with high-voltage dc and high rf is imperative; knowledge or experience in high-frequency systems and components is desirable. National Synchrotron Light Source Department.

DD 3910. RADIOACTIVE MATERIALS TECHNICIAN - Under minimum supervision, performs such functions as assisting in the development, production and assay for distribution of radioactive and nonradioactive materials; packaging, storing and disposing of radioactive-waste materials; and assisting in the operation and maintenance of the BLIP and hot-cell facilities. Requires an AAS in chemistry or equivalent; radiochemistry experience and mechanical aptitude are desirable. Medical Department.

NS 0063. RESEARCH SERVICES POSITION - (temporary) Will perform various manual laboratory and service-support tasks, including washing, sterilizing, autoclaving and maintaining glassware for multiple laboratories within the Department. Biology Department.