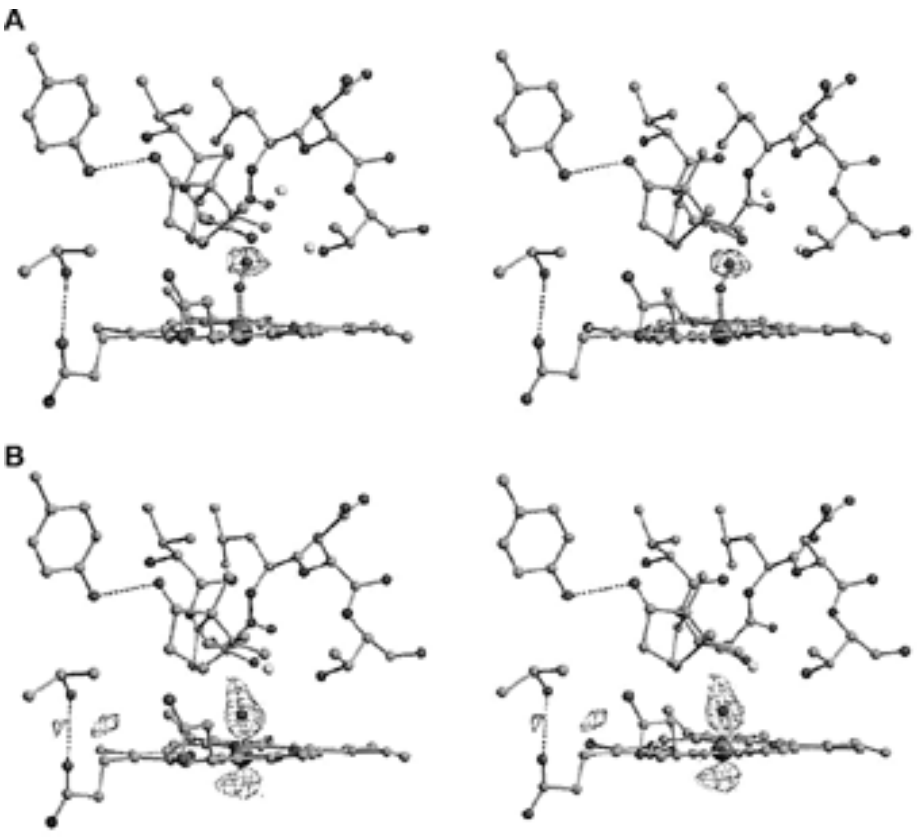
BROOKHAVEN BULLETIN
Vol. 54 - No. 18 May 19, 2000
BROOKHAVEN NATIONAL LABORATORY

NSLS Collaboration Determines Structure of Key 'Blowtorch' Enzyme



These are stereoscopic images of the third and fourth of five steps that show the powerful $P450_{cam}$ enzyme as it oxidizes a camphor molecule. Each step consists of two images, one a left-eye view, one a right-eye view.

The drawing is of a model of the central portion of the cytochrome $P450_{cam}$ molecule combined with camphor in two states, A and B. At the bottom of each image is the flat haeme group (the same as in the blood protein haemoglobin) with the iron atom at the center. Also in each image, a three-ring camphor molecule is just to the left of center. The "chicken-wire" cages, showing high electron density in the crystal, are used to reveal the presence of particular features in the model.

In the A model at the top, the cage shows that there are two oxygen atoms on this molecule of ordinary O_2 molecular oxygen. In B, the cage shows that the second oxygen atom is missing, revealing the unusual transition state for the enzyme. This single oxygen atom is the active oxygen that adds to the camphor molecule to begin its oxidation.

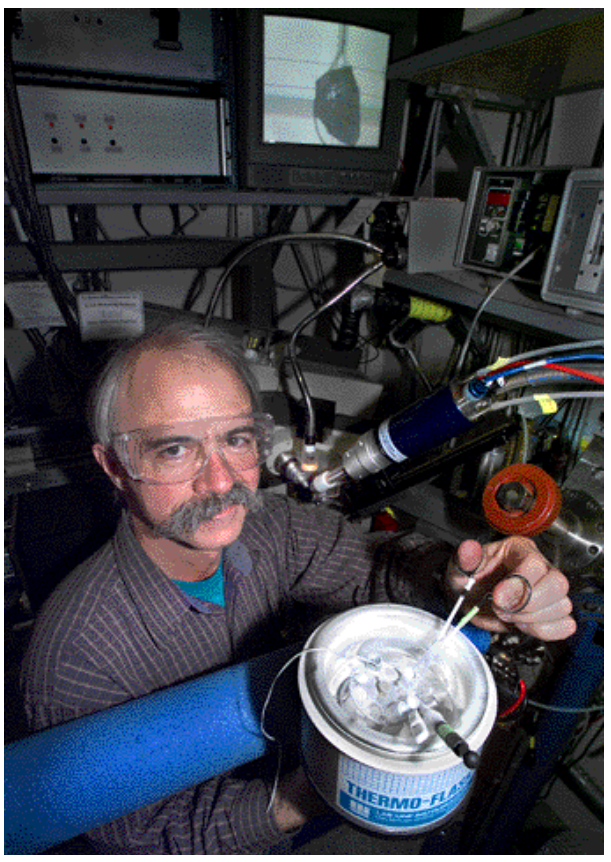


Photo by Roger Stoltenburgh

Robert Sweet, BNL Biology, is seen in the NSLS beam line X12-C hutch. The protein crystals used for the p450 study and apparatus such as the small vials and insulated dish Sweet is holding were kept at liquid-nitrogen temperature. The crystals were mounted on a device which includes a rotation axis and a device that keeps the crystal cold (seen over Sweet's left shoulder). An example of a crystal similar to the p450 crystals is shown in the video monitor at the top of the photo. The crystal, roughly 0.6 mm long, is suspended in a loop of thin nylon fiber in the cold stream of gas.

A team of scientists working at the National Synchrotron Light Source (NSLS) has determined the atomic structure of a key enzyme that performs several important chemical jobs in the body.

Dubbed "the biological equivalent of a blowtorch" because it is so highly reactive with so many organic compounds, the enzyme synthesizes estrogen and detoxifies chemicals as they enter the body. It also has applications in cancer therapy, in reducing pollution in industrial waste streams, and in manufacturing epoxies.

The results of this nine-year x-ray crystallography study at the NSLS were reported in the March 3, 2000, issue of the journal *Science*. The collaboration, led by Ilme Schlichting of the Max Planck Institute for Molecular Physiology, Dortmund, Germany, includes Robert Sweet of BNL's Biology Department; Joel Berendzen, Los Alamos National Laboratory; Kelvin Chu, University of Vermont; Ann Stock, Center for Advanced Biotechnology & Medicine in New Jersey; Stephen Sligar, University of Illinois; and Dagmar Ringe and Greg Petsko of Brandeis University.

Blowtorch Movie

Specifically, the researchers obtained three-dimensional images of the protein called cytochrome $P450_{cam}$ from the bacterium *Pseudomonas putida*. Part of what makes this work so interesting is that the team has produced a molecular movie visualizing five critical steps in one of the enzyme's typical chemical reactions.

Sweet, who participated in the experiment and designed the beam line on which it was done, explained that to make the five-step movie, "We arranged to take the enzyme through its catalytic cycle, and we trapped it during various crucial steps by freezing it with liquid nitrogen. We stimulated it to go through the cycle by using low-energy x-rays, and by a sequence of thawing and refreezing."

To perform the study, the researchers used an intense x-ray beam at NSLS beam line X12-C. In the reaction, the enzyme oxidized, or added oxygen atoms to, a hydrocarbon molecule. "For the first time," Sweet said, "we witnessed this powerful enzyme as it oxidized hydrocarbons — a reaction that can be exploited to clean up pollutants or synthesize new compounds."

Experimental Procedure

To do the experiment, the researchers grew a crystal of cytochrome P450, combined with camphor, an ingredient of certain mothballs, and several other chemicals. This included a step where the crystal was kept briefly in a small pressure chamber at a few thousand pounds per square inch of pure oxygen gas.

The crystal then was exposed to synchrotron x-rays, which added electrons to the mixture, causing a chemical reaction that is the hallmark of the enzyme: it splits molecular oxygen into two atoms and inserts one of the atoms into a hydrocarbon — in this case, into camphor. While the researchers studied an enzyme from a specific bacterium, this reaction is thought to be common to all P450 enzymes.

Potential Applications

This research is the first step in analyzing a class of enzymes that may be used in cancer therapy by shutting down estrogen synthesis in the body.

Also, in a completely different application, genetically engineered $P450_{cam}$ enzymes may be used to eat up toxic chemicals, such as PCBs and trichloroethylene, in chemical manufacturing waste streams, thus preventing groundwater pollution. Finally, they may be used in an environmentally friendly, energy-efficient way to make epoxies.

The work on this project was performed at the structural biology facilities at the NSLS, which are currently the most productive in the world. Within the NSLS, the seven beam lines that are equipped with state-of-the-art instrumentation for structural biology studies are a resource for scientists from universities, industry, and other laboratories from all over the world. — Diane Greenberg

BNL's Clinic Earns High Marks — Named Model Program, Accredited

Michael Herbert

Flanked by BNL Director John Marburger (left) and Kenneth Brog, Assistant Laboratory Director for Environment, Safety, Health & Quality, and the staff of the Occupational Medicine Clinic (OMC) in the background, OMC Head Bryce Breitenstein displays the certificate of accreditation earned by the clinic from the Accreditation Association for Ambulatory Care.

On May 17, BNL's Occupational Medicine Clinic (OMC) was honored with a Model Program Award from the American College of Occupational & Environmental Medicine (ACOEM).

In addition, OMC had just earned accreditation from the Accreditation Association for Ambulatory Care, Inc. (AAAHC).

BNL's OMC provides services to ensure the good health of the Lab's 3,000 employees, facilitates the care and rehabilitation of injured or ill employees and provides professional guidance in matters of health, safety and emergency preparedness.

OMC Head Bryce Breitenstein accepted the Model Program Award at

(continued on page 2)

Fund Started for Los Alamos Fire Victims

For more information, see page 2.

BNL Clinic Awarded *(cont'd)*

the 2000 ACOEM Corporate Health Achievement Awards ceremony in Philadelphia. The international society of 7,000 occupational medicine physicians honored the OMC's comprehensive program for the diagnosis and treatment of occupational and environmental injuries and illnesses as an exemplary model practice.

The society also praised BNL's medical record administration and quality assurance audits, its ongoing health surveillance system, its extensive environmental management system, and its frequent customer surveys.

Commenting on the Model Program Award, Breitenstein said, "The examining team provided us with an in-depth critique, which examined not only our strong points but also our weaknesses and what we could improve, which will help make us better."

The international society honored the OMC's comprehensive program for the diagnosis and treatment of occupational and environmental injuries and illnesses.

Breitenstein was also delighted that OMC had earned the AAAHC accreditation, which, according to the association, "provides proof of quality services and lets patients . . . know an organization adheres to the highest standards of quality care."

"We are pleased that we have conformed to the high standards set for accreditation, and we've done so on a voluntary basis," Breitenstein said. "We are the second U.S. Department of Energy Laboratory to earn accreditation from the AAAHC — the first to receive it was Los Alamos National Laboratory."

AAAHC takes eight factors into account in determining if a healthcare facility will be accredited: the rights of patients; governance; administration; quality of care provided; quality management and improvement; clinical records; professional improvement; and facilities and environment.

Deborah Maresca, OMC's Administrative Manager, explained, "We've recently made several changes to improve OMC's services. For example, we improved the job assessment form that employees complete when they get their physical to help determine fitness for on-the-job duties. We also routinely perform quality assurance studies and reports and have formalized our procedures."

— Diane Greenberg

Omnipoint Demo 5/26

On Friday, May 26, from 10 a.m. to 2:30 p.m. in Berkner Hall, Omnipoint Communications will discuss special rates for BNLers buying digital PCS wireless services on Omnipoint's GSM network.

All service plans include free caller ID, voice mail, SMS messaging, and FOX News headlines. Plans include one from $15.99 monthly with free phone, no minutes or contract; or $16.99 monthly for 40 minutes; or $26.99 monthly for 250 minutes, and others with unlimited weekend calling free for the year of the contract. Other options include special international calling and roaming.

Call Richard Goll at 343-5900.

Diana Vaman Wins Scharff-Goldhaber Prize in Physics Presented by Maurice Goldhaber at BNL Ceremony

Roger Stoutenburgh

Pictured are (from left, front): Julie Pergan, BWIS; Diana Vaman; Maurice Goldhaber, BNL; Pam Mansfield, BWIS; (from left, rear) Alfred Goldhaber, Professor of Physics at the Institute for Theoretical Physics, SUNY Stony Brook, and son of Gertrude and Maurice Goldhaber; and Peter van Nieuwenhuizen, Director of the Institute for Theoretical Physics, SUNY Stony Brook, and Vaman's advisor. In the background is a portrait of Gertrude Scharff-Goldhaber.

Diana Vaman, a Ph.D. candidate in the Department of Physics and Astronomy at the State University of New York at Stony Brook, has won the Scharff-Goldhaber Prize in Physics.

Vaman was awarded the prize at a ceremony at BNL, after she gave a talk titled "Consistent Truncations of 11-Dimensional Super Gravity to 7-Dimensional Super Gravity Theories."

After the talk, Scientist Emeritus Maurice Goldhaber, former Director of Brookhaven Lab and widower of Gertrude Scharff-Goldhaber, noted, "When I first heard of the string theory, I thought, 'so much fiber, and so few calories.' But now we heard Diana's results, promising some healthy nourishment from this super string diet."

The Scharff-Goldhaber Prize, a $1,000 award given annually, was established to recognize substantial promise and accomplishment by a woman graduate student in physics who is enrolled at SUNY Stony Brook or who is performing her thesis research at BNL.

Administered by Brookhaven Women in Science (BWIS), the prize honors the late nuclear physicist Gertrude-Scharff-Goldhaber. In 1950, Scharff-Goldhaber became the first woman Ph.D. physicist appointed to the Brookhaven Lab staff, and, later, she became a founding member of BWIS.

— Diane Greenberg

Fund Started for Los Alamos Fire Victims

Many BNL employees watched in horror last week as their counterparts at Los Alamos National Laboratory (LANL) lost houses, cars and possessions to the raging New Mexico wildfires. DOE has now established a special fire relief fund for LANL federal and contractor employees to help them recover from the disaster.

The fund, which began accepting donations on Monday, May 15, will be used to assist impacted employees over the next several months, augmenting contributions from other state and federal agencies, according to Secretary of Energy Bill Richardson.

"The Department of Energy has an obligation to help our federal and contractor employees as well as the communities suffering because of the fire," said Richardson. "While there are relief agencies providing on-the-spot assistance, we know this will be a long and difficult recovery process for our employees and surrounding communities. This fund is intended to assist our employees and communities as they will surely face many unforeseen and uncovered expenses in the coming months."

Secretary Richardson established this special fund following his visit to Los Alamos last Thursday. The Northern New Mexico Fire Recovery Fund is authorized to accept gifts from all public and private sources, and donations are tax deductible. Richardson has directed the department's Chief Financial Officer to administer the fund, and an Executive Board will be designated to accept and review applications and distribute the fund.

BNL employees and others who wish to contribute can send a check to:

U.S. Department of Energy
Attn: Northern New Mexico Fire Recovery Fund
P.O. Box 500
Germantown, MD 20874-0500.

Checks should be made payable to the Department of Energy and should indicate they are intended for the Fire Recovery Fund.

BNL management has contacted Los Alamos officials to offer additional assistance, but DOE is only accepting financial contributions at this time.

In an e-mail sent to LANL director John Browne, BNL director John Marburger said, "On behalf of Brookhaven National Laboratory, I extend our deepest concern for LANL employees and their families and friends affected by the tragic fire that has devastated their homes and property. BNL employees are prepared to assist in any way possible to reduce the impact of this tragedy upon the lives of our colleagues. Please include us in notices of arrangements for volunteer assistance. Our people are already attempting to contact their counterparts in your organization to learn of details that would guide our response.

"I know how much you care about the Laboratory and its people, and I want to express my personal support during this difficult period. Your leadership has been a good example to all of us."

More information on volunteer assistance and clothing and food donation opportunities will be distributed as it becomes available.

— Peter Genzer

Service Awards

The following employees celebrated service anniversaries during April 2000:

35 Years

Frederick J. Altrui ..... P&P Mgmt.
Bonnie W. Hulse ..... Human Resources

30 Years

Kenneth P. Wokosky ..... C-A

25 Years

Thomas Hanlon ..... Central Shops
Dorothy E. Ivero ..... Env. Sciences
Joel P. Scott ..... Reactor
E. Gail Williams ..... Human Resources

20 Years

John J. Bohenek ..... NSLS
Pamela M. Manning ..... C-A

10 Years

Andrew I. Ackerman ..... NSLS
Richard J. Alles ..... Central Shops
Sorin V. Badea ..... C-A
Susan M. Cataldo ..... Medical
Dwayne E. Eleazer ..... Plant Eng.
Richard H. Lutz ..... Plant Eng.
Philip J. Pizzo ..... Plant Eng.
William A. Schmitz ..... Plant Eng.
Thomas G. Sperry ..... Plant Eng.
Christopher T. White ..... C-A

Arrivals & Departures

Arrivals

Kenneth A. Erickson ..... Safety, Hlth.
Lori-Anne M. Mooney... Ecn.Dev.,Tech.Tr.
Richard M. Osgood Jr. ..... Dir. Office
Anatoli Zelenski ..... C-A

Departures

Laura Ayres ..... Biology
Denis B. McWhan ..... Basic Energy Sci.
Thomas Schlagel ..... Inform. Tech
Paul Stein ..... C-A

Rent-a-PC Demo 5/25

Rent-a-PC will be in Berkner Hall on Thursday, May 25, from 11 a.m. to 2 p.m., to discuss short-term computer rentals for BNL employees.

Rent-a-PC provides desktops, notebooks, LCD projectors, servers, etc., for a day, a week, a month or more. They offer immediate availability as well as local delivery, setup and on-site support.

Equipment is pretested, delivered and installed with a "no excuses" guarantee. For more information, call 273-8888.

Volunteer BNLers Help William Floyd Students Build Robot

Early this year, sponsored by BNL and Computer Associates, BNL volunteers joined with William Floyd High School students and their science teachers to design and build a robot. The robot, named "Hurricane Floyd" by its creators, was entered into the Long Island Regional 2000 For Inspiration & Recognition of Science & Technology (FIRST) Robotics Competition held March 23-25 at Suffolk Community College.

The robot was required to take a series of specially textured balls and put them into a location six feet off the ground. As was the case last year, when a BNL retiree volunteered his expert help in robotics, "our" robot did not win.

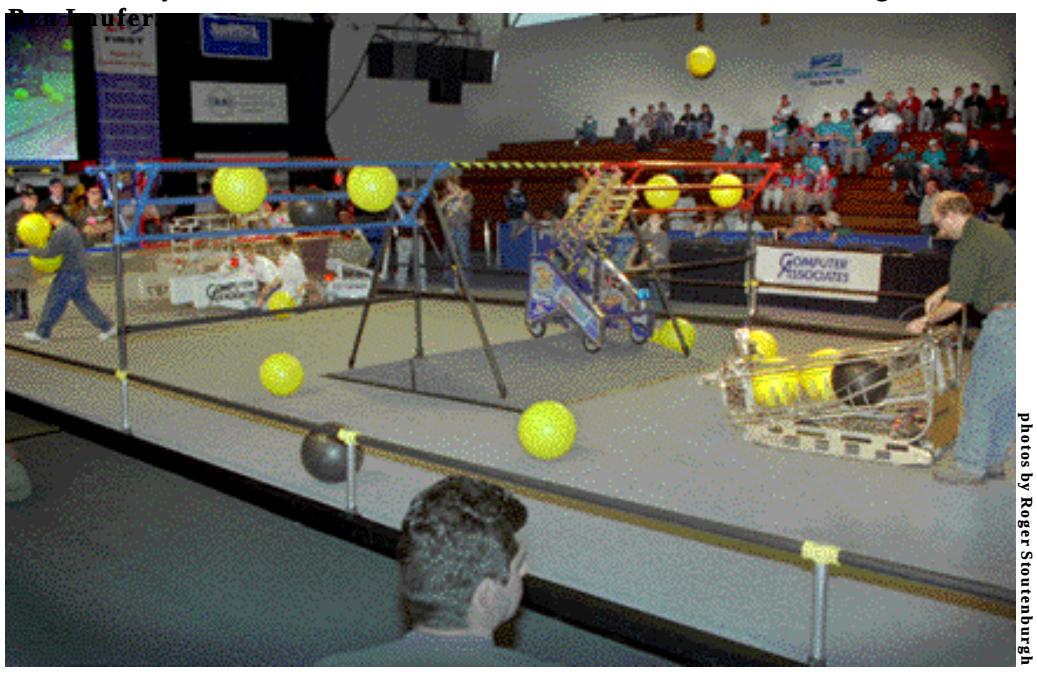
However, as Michael Bebon, Associate Laboratory Director for Facilities & Operations, who took a keen interest in the robot's progress, noted, "Along with the design work, fabrication, testing, deadlines, weight-limits, and last-minute repairs, everyone managed to have a lot of fun, and that is also an important lesson for the students."

Thanking the BNL volunteers for their "commitment, technical skill, and contagious enthusiasm," Bebon commented, "I am very pleased that this project gave the great communities in the William Floyd School District and Brookhaven National Laboratory another chance to work together to give the young people in our neighboring communities the opportunity to experience the excitement that can come from a career in science or engineering."

"Hands-on" volunteers from BNL who masterminded Hurricane Floyd included Sorin Badea, Collider Accelerator Department; Al Farland, Central Shops Division (CSD); Jack Fried, Instrumentation Division; Tom Godzeiba, Jim Gordon, Tom Lambertson, Chris Manning, and Giuseppe Mondi, all of CSD; Paul O'Connor, Instrumentation; Mike Palumbo, CSD; Nikolaos Simos, Energy Sciences & Technology Department; Rich Spellman, Bill Struble, Fred Wahlert, and John Wilson, all of CSD. Volunteers from William Floyd, in addition to the students, were: Dennis Fidotta, Richard Hawkins, Phyllis Palma, Chris Ryon, Mike Whelan, and Tim McArdle. — Liz Seubert

At the competition, some members of the BNL/William Floyd pit crew get Hurricane Floyd ready for action: (clockwise from front left) Al Farland, Nick Simos, Chris Ryon, Paul O'Connor, and Josh Jeanty.

While their physics teacher Chris Ryon (below, right) adjusts robot Hurricane Floyd, the group of William Floyd students (behind barrier at left), prepare to set the robot in motion from afar. Students who participated in the robot program were: JoAnna Cohen, Dave Jeanty, Claudio Ibarra, Josh Jeanty, Jon Kassel, Blazej Kruczkowski, Mike Kwiatkowski, Greg Lombardo, Lauren Melton, Rory O'Fee, Shawn Post, Danielle Rowland, Charles Scaringello, and Ben Laufer.



photos by Roger Stoutenburgh

Defensive Driving

The training group of the Safety & Health Services Division will offer a six-hour defensive driving course on Saturday, June 24, 9 a.m.-3:30 p.m., in Berkner Hall, Room B.

The course is open to BNL, BSA and DOE employees, BNL facility-users, and their families, at $23 per person.

Completing the course entitles participants to a 10-percent discount on liability and collision insurance for three years.

In addition, MetLife now offers a 5 percent discount on auto and home insurance to BERA members. For more information on the discount, call 952-3436.

To register for the driving course, send a check made out to Empire Safety Council, in care of Scott Zambelli, P.O. Box 670, Mount Sinai, NY 11766.

All checks must be received by June 16. It is important to include your phone number on the check in case you need to be contacted.

BROOKHAVEN BULLETIN

Published weekly by the Media & Communications Office for the employees, facility-users and retirees of **BROOKHAVEN NATIONAL LABORATORY**

LIZ SEUBERT, editor
PETER GENZER, contributor
KAREN MCNULTY, contributor
DIANE GREENBERG, contributor
ROGER STOUTENBURGH, photographer

Bldg. 134, P.O. Box 5000 Upton NY 11973-5000
phone (631) 344-2345, fax (631) 344-3368,
e-mail bulletin@bnl.gov

On the World Wide Web, the Brookhaven Bulletin is located at www.pubaf.bnl.gov/bulletin.html. A Weekly Calendar listing scientific and technical seminars and lectures is found at www.pubaf.bnl.gov/calendar.html.

Health Promotion Workshop

'Delicious Vegetarian Cuisine'

To learn new veggie cooking techniques, join the "Delicious Vegetarian Cuisine" workshop to be given by Marlisa Brown, president of Total Wellness, Inc., a nutritional consulting company. The workshop will be held on Thursday, June 1, from noon to 1 p.m. in the Medical Department's Large Conference Room, Building 490.

Many studies credit vegetarian diets with keeping people alive longer with less likelihood of getting heart disease or cancer. But how appealing are vegetables as a main dish? Participants at the June 1 workshop will learn that vegetarian cooking can be colorful, delicious, and easy. Brown will demonstrate various preparations and give recipes with their nutritional values. Participants will be able to sample from platters of veggie food, supplied with the compliments of Flik International.

Brown, who has over 20 years of experience in catering, has appeared on TV on numerous occasions. She ran a monthly cooking show for the American Heart Association and contributed to many publications, including Richard Simmons' *Food Mover Program*.

Space is limited, so register early for the workshop. Complete the flyer sent to all employees and return it to Mary Wood, Bldg. 490, before June 1. For more information, call Ext. 5923.

Hospitality News

The Hospitality Committee invites all on-site residents, their spouses and friends to take part in the following activities. More details are posted in the laundry and on the door of the Recreation Building, both located in the apartment area.

Welcome Coffee

Coffee is served to apartment area residents on Tuesdays, 10-11:30 a.m., in the lounge of the Recreation Building in the apartment area. Call Mimi Luccio, 821-1435, for details.

Parent-Toddler Group

Parents of two- and three-year-olds are invited to bring their children to the Recreation Building every Wednesday, 9:30-11:30 a.m. For more information, call Sarah Zill, 821-2602.

Family Potluck Party, May 26

There will be a Merry May Family Potluck Party at 6 p.m. on Friday, May 26, in the Recreation Building. Bring a dish to share. Call Vicky Chang, Ext. 1000, or Nora Robles, 345-3204.

IBEW Meeting

Local 2230, IBEW, will hold its regular monthly meeting on Monday, May 22, at 6 p.m. in the Knights of Columbus Hall, Railroad Avenue, Patchogue. There will be a meeting for shift workers at 3 p.m. at the union office. The agenda includes regular business, committee reports and the president's report.

No Bulletin, June 2

In observance of Memorial Day, the Lab will be closed on Monday, May 29, so there will be no Bulletin published that Friday, June 2. Notices for publication in the Bulletin of Friday, May 26, should be received by the Brookhaven Bulletin, Bldg. 134, Fax 3368, by today, Friday, May 19.

LINUX Training

The Information Technology Division (ITD) has scheduled the two classes in LINUX:

• LINUX System Administration will meet from July 17-19, 8:30 a.m.-4:30 p.m. The training fee for this three-day, hands-on class is $720 per student.

• LINUX Internals will meet from Monday, July 31 to Friday, August 4, 8:30 a.m.-4:30 p.m. The training fee is $1,160 per student.

Both classes will be held in the seminar room of Bldg. 515. To register, send an ILR for the appropriate amount to Pam Mansfield, Bldg. 515, by May 31. For more information, contact Mansfield at Ext. 7286 or pam@bnl.gov.

Golf Outing

BNL vs. Suffolk County

At the 2nd annual BNL vs. Suffolk County golf outing last year, Suffolk County golfers walked away with the tournament's trophy and a majority of the prize money.

However, with more support from on-site golfers, relatives and friends, we can get this trophy back, say BNL's golfers. This year's outing will be held on Cherry Creek Golf Course Monday, June 12 starting at 7:30 a.m. (shotgun start). The $75/golfer entry fee includes prizes, cart, and lunch after 18 holes of fun. There are 3 formats for the outing:

- 2 player teams using net score (3 flights)
- 4 player best ball (net)
- Suffolk County Golfers vs. Brookhaven Golfers (trophy and bragging rights).

Additional competitions will include putting, closest to the pin on par 3s, and closest to the line on #4. The outing is open to all employees, facility users, contractors, and guests. Make a date to support the Lab — before Wednesday, June 7, contact Gordon Rawn, Ext. 7095, e-mail rawn@bnl.gov.

On-Site Service Station Runs Spring Special

The on-site service station, Upton Industries, Inc., offers a $19.99 special which includes changing the engine oil and filter (up to five quarts), and inspecting: belts, hoses and cooling system; CV boots, suspension components and tires; exhaust system; interior and exterior lighting, PCV valve and breather element. The offer expires May 31. For more information, call Ext. 4034.

Great Adventure Discount Tickets Sold

Tickets for Six Flags Great Adventure are now on sale at the BERA Sales Office for the 2000 season.

The all-new Hurricane Harbor Water Adventure Park is one of the world's largest new water parks. It includes a gigantic wave pool, family activity lagoon, adventure river and more than a dozen wet, wild water slides. Six Flags still features the Great American Scream Machine, the Batman ride, the Viper, Skull Mountain, an indoor roller coaster, the Lethal Weapons water stunt show and the new Batman and Robin ride, called The Chiller.

BERA is selling Early Bird tickets, which are not available at the gate. At $25, they include both park and safari and are good until June 25. Regular park tickets are $42.39, and the Park/Safari combo is $45.57 at the gate. BERA's prices are $33 and $35 respectively, a savings of approximately $10 each, which includes tax and saves waiting on line.

BERA also sells children's tickets at $22 for 48 inches tall and under, strictly enforced. Regular admission to the new Six Flags Hurricane Harbor water adventure park is $28.61, the BERA price is $24. This year, BERA also has $7 meal vouchers which have a value of $10 at the park. Children under three are free. For more information, call Andrea Dehler, Ext. 3347.

Bowling

Awards Dinner

The Bowling Awards Dinner will be held at Ladakins on Friday June 9, 6-10 p.m. The cost is $5/bowler, $10/bowler's significant other and $20/non-bowler. The cost includes dinner, DJ, and open bar. Tickets must be purchased on or before June 6. For tickets contact Tracy Blydenburgh, Ext. 4422 or mail/deliver **checks only,** made out to BERA Bowling, to T. Blydenburgh, Bldg 750.

Bowling News

• **Men's League** — The BERA Men's League has separated from the BERA Mixed League and will convert to a commercial money league in September. The league will still bowl on Tuesday nights but will no longer be sponsored by BERA. If any BNL male employee is interested in bowling on this league, contact Ron Mulderig at Ext. 3084, e-mail mulderig@bnl.gov.

• **Mixed League** — To maintain the BERA Mixed League next year, we need to know how many employees expect to rejoin. Volunteers are needed to fill the bowling officer positions of President, Treasurer, and Secretary, which must be filled or the league may be terminated. Any BNL employee/retiree may be an officer. Be sure that anyone nominated is willing to accept the position. Contact Tracy Blydenburgh, Ext. 4422, or Debbie Keating, Ext. 3888, before June 2.

Swimming Lessons

Applications are now being accepted for BERA's summer swim program. The program is open to children of all BNL employees, facility users, and guests of the Lab.

Swimming classes will begin on Wednesday, July 5, and will end on Tuesday, August 29.

• **Program** - Each child will have one lesson each week for a total of eight lessons. American Red Cross certificates will be awarded to children meeting requirements by the end of the classes.

• **Time** - Monday-Friday, 2:15-3:15 p.m. Children should arrive at 2 p.m to prepare for the class.

• **Fee** - $50 for each child at registration, plus $2 daily admission fee, unless the child holds a season ticket, which must be presented each lesson.

• **Requirements** - For safety, each child must be a minimum 42 inches tall.

• **Registration** - Pick up applications at Human Resources, Bldg. 185, 8:30 a.m.-5 p.m.; at the BERA Sales Office, Berkner Hall, on weekdays, 9 a.m.-3 p.m.; or at the swimming pool during scheduled hours. Mail or deliver applications with registration fees (in checks made payable to BERA) to the Recreation Office, Bldg. 185, no later than Friday, June 16.

Classified Advertisements

OPEN RECRUITMENT - Opportunities for Laboratory Employees and Outside Candidates.

MK8583. POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. or M.D. with experience in current biology and cell biology techniques of gene expression in mammalian cultures and with radiobiology and/or radiation oncology research. Experience in the following research areas desirable: cancer research, neuroscience or biochemistry; research skills desirable: handling of small animals, handling radioactive isotopes, digital microscopy imaging, Western blot analysis, and spectrophotometric assays. Work will involve implementing PET instrumentation improvements within BNL's NIDA/DOE Regional Neuroimaging Center. Will be responsible for performing periodic evaluations of existing instruments, developing and carrying out experiments to improve the quality of current measures and establishing research collaborations with other PET groups on PET instrumentation. Under the direction of L. Pena. Medical Department.

MK8587. POSTDOCTORAL RESEARCH ASSOCIATE - Requires a Ph.D. in cell/molecular biology and several years postdoctoral and other research experience in the field of radiobiology and/or neurobiology. Should have expertise in a wide range of molecular and cellular activities, including cell culture methods, cloning, immunocytochemistry and flow-cytometry. Position is in the Space Radiobiology Group, which will examine the molecular and cellular responses of neuronal cells to the space environment. Emphasis is placed on the effects of radiation (heavy ions) and neurotoxicants using in vitro neuronal cell systems. Additional responsibilities include support of users for a NASA sponsored space radiobiology research program. Under the direction of M. Vazquez. Medical Department.

NS8885. COMPUTER APPLICATIONS SPECIALIST (term appointment) - Requires an AAS in computer science, or the equivalent, pertinent experience and demonstrated aptitude to learn quickly to administrate, maintain and provide real-time support of the scientific computer system supporting the STAR research program. Responsibilities will include hardware/software purchasing, installing, and troubleshooting upgrades and networking; maintenance of printer hardware/software; purchasing of computers and peripheral equipment; file system backup; technical assistance; and networking monitoring and administration. Physics Department.

DD8619. DIAGNOSTIC TECHNICIAN POSITION - Will work in a small group constructing and testing custom VME based laboratory instrumentation. Responsibilities range from prototyping to final testing and installation of controls and diagnostic equipment. Work will be done under the direction of a group supervisor while working closely with engineers and physicists. Work involves feedback systems, high speed precision data acquisition, and timing controls. Requires a thorough knowledge of digital and analog electronics. Must be able to use standard test equipment and work from schematics, rough sketches and verbal instructions. BSET preferred. Familiarity with high speed analog and RF techniques is desirable. National Synchrotron Light Source Department.

DD8886. TECHNICAL POSITION - Requires an AAS degree, experience in electro-mechanical technology or equivalent and ability to install, repair and assemble electronic systems. In addition, experience using soldering equipment to repair and assemble pc boards with fine pitch SMT &Thru-hole devices, in addition to experience assembling and repairing cable assemblies also required. PC experience and the ability to read and work from electronic schematics and assembly drawings highly desirable. Physics Department.

DD8921. REFRIGERATION & AIR CONDITIONING ENGINEER - Under minimum supervision constructs, install, repairs, maintains and operates refrigeration, air conditioning, ventilating and auxiliary and related equipment. Will perform the same work on air compressors and vacuum pumps whether or not associated with the above equipment. Plant Engineering Division.