

BNL Goes FACE to FACE With CO₂ in Switzerland

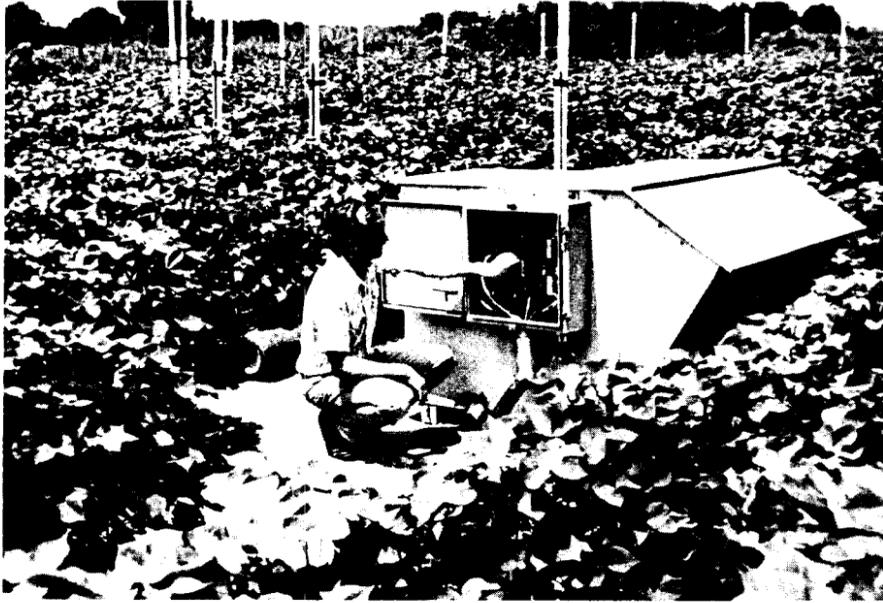
In the spirit of international cooperation to study global climate change, BNL will collaborate with the Swiss Federal Institute of Technology to build a facility for field experiments on plants. Construction will begin this spring, with experiments planned for the fall.

Available for use by the international scientific community, the new facility will be located in Eschikon, 15 kilometers outside of Zurich. It will be modeled after a Brookhaven-developed, free-air carbon dioxide enrichment system, known as FACE.

According to Department of Applied Science researcher George Hendrey, BNL's principal investigator on the project, the new facility will help address two large issues: How will plant communities respond to carbon dioxide (CO₂) enrichment? And, on a global scale, how will changes in the plant community alter feedback processes regulating the concentration of atmospheric CO₂ in the future?

Brookhaven's FACE system, developed by Hendrey's research group in the late 1980s, is a novel approach to doing field experiments in which plants are exposed to elevated levels of CO₂.

Scientific studies show that atmospheric CO₂ has risen dramatically since the beginning of the industrial revolution. CO₂ traps infrared radiation that would otherwise escape,



In the midst of a cotton field in Arizona, where BNL is already operating a FACE station, Keith Lewin checks the electrical panel that controls the carbon dioxide analyzer, fan and filters housed within the box.

thereby causing the earth to heat up. This phenomenon, known as the "greenhouse effect," may already have begun. Potential consequences include rising sea levels, changing precipitation patterns and shifting of agriculturally productive regions and of ecosystems.

Says Hendrey, "When a plant is

exposed to more carbon dioxide, it grows faster, resulting in an increase of biomass. Some of our FACE studies show that plant root mass increases even more than the aboveground parts of the plant. Since much of a plant's biomass is underground in its roots, a major portion of the carbon that the plant removed from the

atmosphere during its lifetime will remain in the soil long after the plant has died."

Brookhaven's field studies on cotton plants in Arizona, conducted in collaboration with several dozen investigators from the U.S. Department of Agriculture and the university community, have shown an accelerated rate of carbon accumulation in the soil. This observation is significant, according to Hendrey, because below-ground storage of carbon is likely to be the most important means by which the terrestrial ecosystem could buffer the rate of increase of atmospheric CO₂ over long periods of time.

As pasture ecosystems are important to the Swiss economy, the Swiss FACE facility will be designed to study how managed grasslands respond to fluctuations in CO₂.

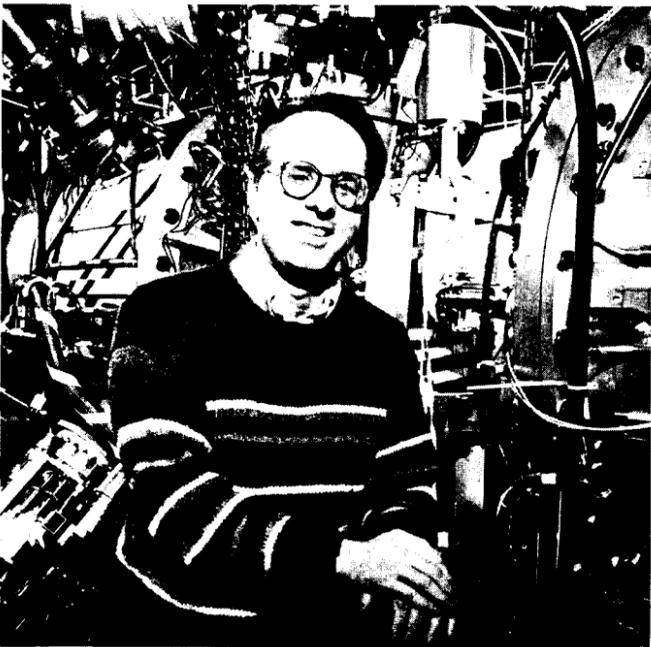
The system will be composed of circular arrays of vertical pipes that are controlled by computer to release CO₂. The rate of release will be adjusted on a second-to-second basis using measurements of wind direc-



BNL Lecture: Towards a Brighter NSLS

Superlatives have been bestowed upon BNL's National Synchrotron Light Source (NSLS) ever since its 1982 commissioning as the brightest source of its kind in the world.

Today, for example, the NSLS is the world's largest



Sam Krinsky stands in front of the radio frequency (rf) cavities at the National Synchrotron Light Source. Installed in December, a fourth rf cavity (left) has made it possible to go to higher beam current. — Photo by Roger Stoutenburgh

facility for scientific research using x-rays, ultraviolet light and infrared radiation. It also holds the world record as the research facility used by more scientists than any other worldwide — about 2,500 annually.

A key reason for the success of the NSLS has been its high brightness — a feature that continues to be central to the design of third-generation light sources now under construction in the U.S., Europe and Japan. It is also a feature that accelerator physicists at the NSLS hope to improve by a factor of 10.

This goal will be discussed by Deputy NSLS Chairman Samuel Krinsky when he delivers the 285th Brookhaven Lecture on Wednesday, March 10. Entitled "Towards a Brighter NSLS," his talk will begin at 4 p.m., in the large seminar room of Physics, Bldg. 510. Introducing the speaker will be NSLS Chairman Denis McWhan.

Krinsky will review the philosophy underlying the original design of the NSLS, explaining why high brightness was such a vital necessity for certain experiments planned for the facility and why low-emittance of the electron storage ring became a fundamental parameter to achieve high brightness.

To make this high brightness possible, the electron beam orbit must be highly stable. Achieving this required a feedback system to detect and correct minute changes in beam position. Existing technology could be used to stabilize a few beam lines, but, as the NSLS grew to its present 85 beam lines, a more comprehensive, less expensive system was called for.

The solution was the Global Orbit Feedback System. Devised by Li-Hua Yu, Krinsky and seven of their colleagues, this system won an R&D 100 Award in 1989 as one of the top 100 technology achievements of the year.

With the electron orbit highly stable, Krinsky will explain, NSLS physicists are pursuing plans to increase the brightness of the x-ray ring by a factor of 10. To achieve this, three avenues are now being explored: increasing beam current from its present operational limit of 250 milliamperes (mA), and beyond the recently set 300 mA record, to 500 mA; reducing the beam's vertical emittance from about 1.5 nanometers (nm) to about 0.4 nm; and decreasing the gap through which electrons pass in magnetic insertion devices within the ring.

Lastly, Krinsky will discuss how producing high brightness with a free electron laser (FEL) is also a goal. The NSLS is developing the design of a UV-FEL, and a proof-of-principle experiment is being prepared using the Accelerator Test Facility in BNL's Center for Accelerator Physics.

Sam Krinsky earned his B.S. in physics at the Massachusetts Institute of Technology in 1966, then went on to Yale University, where he received his Ph.D. in physics in 1971. That year, Krinsky became a research associate at the Institute of Theoretical Physics at the State University of New York at Stony Brook.

Krinsky joined BNL's Physics Department in September 1973, as an assistant physicist. He was promoted to Associate Physicist in 1975 and transferred to the Accelerator Department in 1977. Named Physicist in 1978, he received tenure in 1980.

In 1982, Krinsky joined the NSLS Department, where he became Senior Physicist in 1985. He was named Deputy NSLS Chairman in 1986 and served as Acting Chairman for about six months, 1989-90.

Krinsky is a Fellow of the American Physical Society.

After the lecture, all are invited to join the speaker for discussion and refreshments. To accompany him to dinner at a restaurant off site, call Judy Thompson, Ext. 2145.

tion and speed, as well as the CO₂ concentration in the center of each circle.

Mechanical and electrical components, plus a computer, are being ordered now. The Swiss institute is paying for the hardware, at a cost of roughly \$250,000.

Already, Silvio Koller, an engineer from the Swiss Institute of Plant Science, within the Institute of Technology, has worked on setting up a FACE experiment in Arizona. He will (continued on page 2)

Lab Studies Old Oil Spill

BNL's Office of Environmental Restoration (OER) is now investigating an area around the Lab's Central Steam Plant, in order to determine the extent of oil and solvent contamination from past spills and leaks. This work is being done as part of the Lab's Superfund cleanup.

The primary contamination in the area stems from a 1977 oil spill. Although it was cleaned up at the time and the cleanup was approved by the appropriate outside agencies, samples taken in the mid-80s showed residual oil in the soil.

The investigation started in December and will continue through August. It consists of soil-vapor sampling, installing monitoring wells, groundwater sampling and aquifer testing, which checks for permeability of the soils. This work, which is being carried out by an outside contractor, will be used to determine a cleanup strategy.

Overseeing the work for OER is project engineer Achyut Topé, and the field engineer is Teresa Baker.

Holding Up Under Stress

How much stress can a 24.2 gram basswood bridge stand?

Well, this bridge — built by Janet Chan of Patchogue-Medford High School (see photo) — supported



Roger Stoutenburg

nearly 38 kilograms, or 1,530 times its own weight, before cracking and taking third place in the 1993 BNL Model Bridge Contest. Seen with the third-place winner is engineer Jim Cullen, Alternating Gradient Synchrotron Department, who was one of the volunteers testing the bridges.

Held on Saturday, February 27, in Berkner Hall and organized by the

Tour Program in the Public Affairs Office, the regional contest drew approximately 300 students from 25 Suffolk County high schools. Two Huntington High School seniors — Judd Cavalier and Sen Amirthalingam — won the top prizes.

Cavalier's bridge weighed 24.8 grams and supported about 46 kilograms, or about 1,856 times its own weight before it began to crack under the stress tester. Amirthalingam's bridge weighed 24.03 grams, and supported almost 40 kilograms, or 1,646 times its own weight.

Brendan Gray, another Huntington High School senior, won the aesthetic prize for building the most attractive bridge.

The top two winners are eligible to enter the 1993 International Bridge Building Contest, which will be held at the Illinois Institute of Technology in Chicago on May 1.

FACE to FACE (cont'd)

arrive at the Lab in a few months to help with preassembling subcomponents for the Swiss station.

The principal Swiss scientist on the project is Josef Nösberger, and Herbert Blum will be the site coordinator.

BNL's responsibility is the overall design, as well as the operation of the facility, with DAS researchers Keith Lewin and John Nagy primarily involved in the engineering details of the project. Stephen Long and Gui-Ying Nie will be working on plant biology.

In addition to the Swiss facility and Brookhaven's station in Arizona, two other FACE facilities are being developed by BNL and other collaborators. One will be located in North Carolina, to study the engineering of FACE-type experiments in tall forests, and the other in New Zealand, also to study grasslands.

Says Hendrey, "All of these facilities will be part of an international FACE network aimed at assessing global terrestrial carbon flux in a carbon dioxide-enriched world."

Hendrey considers these FACE stations to be environmental ana-

logues to the accelerators used for particle physics research. "With FACE, we have user facilities for experimenters studying plant biology instead of particle collisions," he says.

Brookhaven's FACE research is a component of the U.S. Global Change Research Program and of the International Geosphere-Biosphere Program. It is primarily funded by the U.S. Department of Energy, with additional support from others, including the Department of Agriculture's Agricultural Research Service and Forest Service, and the pulp and paper industry. — Mona S. Rowe

Coming Up

China's renowned pianist Yin Cheng-Zong will appear in concert on Tuesday, March 16, at 8 p.m., in the Snyder Seminar Room, Bldg. 911. His program will include works by Chopin, Debussy and Haydn, as well as two ancient Chinese pieces.

Purchase tickets at the door for \$12, general admission; \$9 for students and people over 65; and \$5 for youths under 18.

Road Closing

The section of Bell Avenue adjacent to the tennis courts will be subject to closing March 8-12, to allow underground utilities to be installed.

Service Awards

The following employees celebrated BNL service anniversaries during February 1993:

35 Years

George E. Oldham..... Plant Eng.
Richard C. Richardson..... Instrum.

30 Years

Robert S. Frankel..... AGS
Everett S. Harris..... AGS
Keith W. Jones..... App. Science
Gerard J. Mayman..... RHIC
Robert L. Mosley..... Saf. & Env. Prot.
Dale A. Norden..... RHIC
John W. Olness..... Physics

25 Years

Veronica A. Evans..... Comp. & Comm.
Frank E. Kito..... Biology
Edward J. Woessner..... Plant Eng.

20 Years

Edward J. Bleser..... AGS
William R. Casey..... Saf. & Env. Prot.
Alfred R. Mack..... AGS
Gladys L. Mack..... AGS
Sonja Santos..... Nuc. Energy

10 Years

Lewis Jiggetts..... RHIC
Brenda H. Laster..... Medical

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

Leaving the Lab — After 35 Years or More

The Bulletin periodically salutes employees who retire with 35 or more years of service.

When Clemens Auerbach checked into BNL's Columbia dormitory one very hot weekend afternoon in July 1956, there was absolute quiet.

"The place seemed deserted," he recalled. "Then, I realized that a lot of other people were around — but they were asleep. It turned out they'd been working on experiments all night."

The experiments were especially interesting. They led then summer guest scientists T.D. Lee of Columbia University and C.N. Yang of the Institute of Advanced Study to question the conservation of parity in weak interactions — work that gained them the next year's Nobel Prize in physics.

After meeting many wide-awake BNLers over the next 36 years, Auerbach retired from the Lab last December 31 as a Chemist in the Department of Nuclear Energy (DNE).

On his first work day, July 23, Auerbach had come to join the then Nuclear Engineering Department as an assistant analytical chemist, developing and adapting analytical methods for materials associated with new reactor and fuel processing concepts. Later, he helped develop new electrochemical instrumentation, and researched the electrochemistry of uranium and other elements in molten salts. By 1958, he was an associate chemist and was named Chemist in 1962.

"I'm sorry that I didn't keep better track of changes outside the site," reflected Auerbach. "For instance, when William Floyd was finished, or when we stopped using the south gate to get onto a small, bumpy road that reached down all the way to Montauk Highway."

One change on site Auerbach remembered was the building of Berkner Hall during the 1960s. "Top artists came to give concerts there,



Roger Stoutenburg

Clemens Auerbach

with the Juilliard Quartet at the inauguration of the auditorium," he said. His lifelong interest in music led to a strong involvement with the concerts held at BNL, including a year as chairman of the BERA concert committee. "I became a sort of fixture in turning pages for many of the musicians, but gave up when my glasses no longer allowed me to see the music clearly," he admitted.

From the early 1970s on, Auerbach worked on a variety of studies on domestic and international nuclear safeguards and classification issues. He drew on his earlier BNL experience in contributing the chapter on "Non-Aqueous Reprocessing Technology" to *Long-Term Proliferation and Safeguards Issues in Future Technologies*, known to insiders as "The Crystal Ball Report." In 1974, Auerbach was one of three BNL staff honored for his "outstanding contribution to the Atomic Energy Commission's Declassification Review Program."

During this time, from 1967-78,

Auerbach also edited *Chemical Instrumentation*, an interdisciplinary journal, for a private publisher. Then, when BNL's International Safeguards Project Office (ISPO) was formed in 1977, he was one of the first liaison officers stationed at the U.S. Mission to the International Atomic Energy Agency in Vienna.

"That was an exciting and stimulating time," he commented. "I regret that in those days, the regular duration of the job was only six months. Today, it's two years."

In the 1980s, Auerbach worked on activities sponsored by the U.S. Department of Energy's Office of Classification, designing and preparing educational and training material. Later, he participated in an extensive revision of the original Classification Guide on Safeguards and Security and worked on developing classification guidance in the area of the space reactor power systems.

Auerbach's expertise is still on hand at BNL — he remains a consultant to DNE. As he said, "Staying involved keeps one young." His many other interests may keep him even more involved, however. For one thing, there is music, including, he hopes, a return to the serious piano playing of his youth.

He also plans to write memoirs on his experiences first as a child in Germany and then, from 1936 to 1945, as an emigre in Turkey, where he graduated from Istanbul's Robert College in 1943 before coming to the U.S. to get his Ph.D. in chemistry from Harvard University. To this may be added the adventurous possibilities brought about by his wife Josette's travel agency, located in their home village of Bellport. Last, but not least, his son and daughter-in-law live only a few driving hours away.

Evidently, Auerbach will have no time left for his least-favorite pursuit — "Absolutely no gardening!" he declared. — Liz Seubert

Daffodil Days

Again this year, BERA will take part in "Daffodil Days," an annual event sponsored by the Long Island Division of the American Cancer Society.

Each containing 10 flowers, bunches of daffodils will be sold for \$6 each in the lobby of Berkner Hall on Thursday, March 25, from 11:30 a.m. to 1 p.m., and in the BERA Sales Office, Thursday and Friday, March 25 & 26 from 9 a.m. to 1:30 p.m. To reserve your bunches of spring sunshine, pay for them prior to March 25, at the BERA Sales Office.

Indian Concert: Location Change

The location of tonight's instrumental concert featuring Indian artists Ulhas Bapat and Nishikant Barodekar and sponsored by the BERA Indo-American Association has been changed to the Berkner Hall auditorium, at 7 p.m. Admission is \$10 adults and \$5 children. For more information, call A.M. Topé, Ext. 5672, or Jan Naidu, Ext. 4263.

Cooking Exchange

The Cooking Exchange will hold its monthly meeting on Wednesday, March 10, at 11:30 a.m. in the Recreation Building. All are welcome to join in sampling a variety of tasty dishes and meeting with new friends.

A donation of \$2 per adult is requested; baby-sitting is provided for \$1 per child. For more information, call Laura Gottlieb, 341-1022.

Volleyball

Standings as of February 24

Open League		League I	
The Roofing Co.	41-13	Network News	39-12
GTeam	39-15	Upfagrabs	33-15
Penetrating Veggies	20-34	Rude Dogs	33-15
Farside	19-35	VolleyBallAholics	32-19
Me & the Boys	16-38	Underdogs	15-33
		Fornossing	10-38
League II		League III	
Monday Nite Live	40-5	Jolly Veggies	31-14
Safe Sets	34-11	High Volley'em	28-17
Nuts & Bolts	26-19	Upton Ups	26-19
Fossils	23-22	Volley of the Dolls	23-22
Night Court	18-27	Nutcrackers	22-23
Net Wits	15-30	Silver Bullets	22-23
Just Up	13-32	Mis-Fits	15-30
Sourcerers	11-34	Hairballs	13-32

Arrivals & Departures

Arrivals

David Boeje..... AGS
 Michael A. Cowell..... Dir. Off.
 Stephen L. Crivello..... RHIC
 Dennis A. Danseglio..... Plant Eng.
 Gonzalo Maldonado..... RHIC
 Todd J. Satogata..... RHIC
 Alexei V. Selikhov..... RHIC
 Christopher J. Stelmach..... NSLS
 Ji Sun..... Chemistry

Departures

This list includes all employees who have terminated from the Lab, including retirees:
 Robert M. Brown..... App. Science
 Paul G. Edwards..... Saf. & Env. Prot.
 Jack H. Gandrey..... AGS
 Milton Heinberg..... Nuc. Energy
 Herbert L. Kinney..... Dir. Off.
 Sanghoon Lee..... App. Science
 James A. Pontieri..... Plant Eng.
 Sathya Ramavataram..... Nuc. Energy
 Irma J. Reilly..... Photo. & G. Arts
 Henry P. Stemm..... Cent. Shops
 Marie A. Susa..... Medical
 Robert H. Tallon..... AGS

Cash Prizes for Perfect Attendance



BNL's 1992 Perfect Attendance Awards — each a \$200 U.S. savings bond — have been won by 27 full-time employees who were on the technical and clerical schedules. Ten of them (see starred names) also won the award in 1991, the first year it was presented as part of the Lab's new Employee Recognition Program.

Congratulations to the perfect attendees: (front, from left) Patricia Ennis, Department of Nuclear Energy (DNE); Nancye Wright, National Synchrotron Light Source (NSLS) Department; Marc Montemagno, NSLS; Richard Wall, Physics Department; (second row, from left) Maryann Kershaw*, Medical Department; Edward Koropsak, Alternating Gradient Synchrotron (AGS) Department; Victoria Johnson, Fiscal Division; Edward Zeitler*, NSLS; Antonio Rodrigues, NSLS; Michael Buckley, NSLS; (third row, from left) James Calcanes*, Computing & Communications Division; Paula Pozzoli*, Staff Services Division; Robin Gianopoulos*, Reactor Division; Kenneth Jones, RHIC Project; Louisa Barone, Personnel Division; (back, from left) Paul Callegari, AGS; Michael Lehecka, RHIC; William McKeon*, RHIC. Not present were Susan Anderson, Reactor; Celeste Antapli*, Technical Information Division; Marjorie Chaloupka, DNE; Allan Corby, Management Information Systems Division; William Jew*, NSLS; Eric Klug*, Safety & Environmental Protection Division; James La Bounty, RHIC; Leonard Pharr*, NSLS; and Phyllis Tinsley-Smith, Biology Department.

—Photo by Roger Stoutenburgh

Don't let the March wind blow your mind —



Remember The **BNL FOOD DRIVE!**
 Pickup all next week — and, note: This is the LAST month to send King Kullen receipts To Carole Kerr, Bldg. 4 60.

Cafeteria Menu

Luncheons

Monday, March 8	
Soup: Chicken rice	.80/1.10
Entree: Cheese ravioli w/marinara sauce	3.35
Lite Choice: Scrod New England-style	3.65
Carvery: Hot pastrami sandwich	2.95
Grill: Pacific mahimahi w/Creole rice	3.95
Taster's Bar: Fried mozzarella sticks (oz)	.25
Tuesday, March 9	
Soup: Potato cheddar	.80/1.10
Entree: Eggplant Parmesan	3.25
Lite Choice: Baked herb chicken	3.45
Carvery: Hot roast beef sandwich	2.95
Grill: 8-oz. Club burger, fries & soda	3.25
Taster's Bar: Hot wings w/dressing (oz)	.25
Wednesday, March 10	
Soup: Three-bean soup	.80/1.10
Entree: Steamed knockwurst & cabbage	3.35
Lite Choice: Lemon-pepper catfish fillet	3.85
Carvery: Hot ham sandwich	2.95
Grill: Marinated salmon steak w/fried sweet potato	3.95
Taster's Bar: Mini pepperoni pizzas (oz)	.25
Thursday, March 11	
Soup: Potato kale	.80/1.10
Entree: Cheese tortellini Parmesan	3.35
Lite Choice: Bounty vegetable beef stew	3.65
Carvery: Hot corned beef sandwich	2.95
Grill: Oriental yellow tuna steak w/rice	3.95
Taster's Bar: Chicken wings w/salsa (oz)	.25
Friday, March 12	
Soup: New England clam chowder	.80/1.10
Entree: Grilled kielbasa w/sauerkraut	3.35
Lite Choice: Baked catch of the day	3.85
Carvery: Hot turkey sandwich	2.95
Grill: Tuna melt platter	3.25
Taster's Bar: Seafood fritters (oz)	.25

Movie Night... Brookhaven Center
 Wednesday, March 10... 8 p.m.
 A League of Their Own... free popcorn!

Buy Mets Tickets By Lottery

BERA has again purchased a limited number of Mets home-game tickets, which will be offered to BNL employees by lottery. The tickets are for weekend games only, and two or four seats are available per game. No single seats will be sold.

To sign up for the lottery, call Carolann Zebrowski, Ext. 3347, in the BERA Sales Office, 9 a.m. to 1:30 p.m., by Wednesday, March 24. The Executive BERA Board will conduct the lottery drawing at 2 p.m. that day. To participate, you must give your name, life or guest number, number of tickets you want (2 or 4), and a telephone number at which you can be reached from 3 to 5 p.m. on Wednesday, or all day Thursday or Friday.

Tickets will be distributed by lottery order on Monday, March 29, at 11:30 a.m. in Room D, Berkner Hall. You must be present when your name and number are called to have first choice of games, dates, etc. If you cannot be available for ticket pickup on Monday, then you must have a designated person do so for you, or your request will be forfeited.

Tickets will be \$15 each, and a list of available tickets and dates are now at the BERA Sales Office. For more information, call Carolann Zebrowski, Ext. 3347.

Software Course

The Computing & Communication Division (CCD) has scheduled a Solaris 2.1 system-administration course for the full week of April 26. This course will both introduce Solaris 2.1 system administration and contrast it with SunOS 4.1.X.

To reserve a seat on a first-come, first-served basis, submit an ILR for \$200, or for more information, contact Ron Wittlock, Ext. 4112, or send Email, wittlock@bnl.gov.

Note to Employees:

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

Sign Up Now For Kindergarten

Registration for the on-site kindergarten run by BNL's Child Development Center (CDC) closes on Monday, March 15. A minimum of 12 children is required to conduct kindergarten classes next fall. For more information or to register a child, call CDC Director Deborah O'Neill, Ext. 7416.

PSI Meeting

A multimedia show on "Recycling in Your Everyday Life" will be presented by Regina Luckas of the Cornell Cooperative Extension of Suffolk County, at the next meeting of the Upton Chapter of Professional Secretaries International (PSI), on Thursday, March 11, at 6 p.m., in the Brookhaven Center's south dining room.

For more information, call Sharon Jones, Ext. 2493, or Mary Blaszkzy, 632-6180.

Basketball

Games of February 25

Deep Six 53	Scram 48
N. Donahue 16	A. Boerner 11
R. Hart 14	J. Duggan 11
D. Eleazer 11	E. Gregory 7
U. Tapley 7	S. Coleman 6
C. Butts 3	T. Powers 6
N. Tyler 2	J. Skonieczny 4
	J. Barkwell 3

3-point shots: E. Gregory, U. Tapley

Trailblazers 68	Runaways 55
T. Mayo 17	G. Shepherd 14
G. Mack 16	W. Cummings 13
R. Domenech 11	J. Gaeta 8
T. Fountaine 11	B. Wells 6
C. Edwards 10	D. White 4
S. Springston 3	P. Ratzke 3
	C. Saxon 3
	R. Doty 2
	L. Furenlid 2

3-point shots: R. Domenech (3), T. Fountaine

Last Chance to Pick A Student or a Teacher

Until 4:30 p.m. today, applications for the following three summer programs run by the Office of Educational Programs (OEP) may be reviewed in the Science Education Center, Bldg. 438:

- **Summer Students** — Junior and senior undergraduates receive summer research appointments. OEP pays individual stipends of \$225/week and round-trip transportation; sponsoring department pays student's housing, \$80/week. June 7-August 13.
- **Summer Interns** — For students who have participated in a prior U.S. Department of Energy High School Honors Program at BNL; no cost to sponsoring department. June 7-August 13
- **Local applicants for Teacher Research Associates (TRAC)** — Secondary science, mathematics and technology teachers work in BNL's research programs for eight summer weeks, under direction of staff advisors, at no cost to advisor's department. June 28-August 20

All requests must be submitted to Departmental Coordinators today. For more information, call OEP, Ext. 4503.

BROOKHAVEN BULLETIN

Published weekly by the Public Affairs Office for the employees of BROOKHAVEN NATIONAL LABORATORY

ANITA COHEN, Editor
 MARSHA BELFORD, Assistant Editor

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 (516) 282-2345

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 Personnel Division lists new placement notices. The purpose of these listings is, first, to give employees an opportunity to request consideration for themselves through Personnel, 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 (282-7744), for a complete listing of all openings.

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

POSTDOCTORAL RESEARCH ASSOCIATES - (two) trained in molecular biology with knowledge of genetics, biochemistry and microbiology, either to: 1) investigate the regulation of genetic expression of restriction enzyme systems and biochemical characterization of the endonucleases and methylases, including structural studies of the interaction of these proteins with DNA; or 2) study DNA mismatch repair in *Streptococcus pneumoniae* and other organisms, and related processes of mutagenesis, recombination and genetic transformation. Contact: Sanford Lacks, Biology Department.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

DD 2355. OFFICE SERVICES POSITION - (part-time) Requires an AAS or equivalent experience, excellent communication skills and demonstrated organizational skills. Computerized database maintenance experience is desired. Will assist Safeguards, Safety and Nonproliferation Division Librarian in the acquisition, processing and maintenance of library materials. Duties will include ordering, check-in, and physical preparation of documents; cataloging on computerized databases; distribution of materials; and general library maintenance. Must be able to obtain and maintain a security clearance. Department of Nuclear Energy.

NS 0196. CHIEF PLANNER/ESTIMATOR - Requires in-depth knowledge of work-order processing and procedures, including familiarity with JCARS, IPAP and estimating standards. Will be responsible for supervising the planning, estimating and scheduling of all types of plant maintenance and repairs, and the timely and efficient preparation of job layouts, material orders and labor estimates. Plant Engineering Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

DD 0873. COMPUTER/ANALYST POSITION - Requires a BS in a scientific or engineering field and three years' programming experience or MS in computer science. Familiarity with object-oriented methods, UNIX relational databases, computer graphics and network programming is required, as is experience in programming in C (C++ preferred) and graphical-user interface (GUI) programming using MOTIF/X. Responsibilities will include the design and implementation of data-processing and data-validation system for the Protein Data Bank (PDB), the design and implementation of procedures to manage and access data from SYBASE relational database tables, and production of a commercial grade PDB-AUTHORIN program for worldwide distribution. Chemistry Department.

DD 0874. COMPUTER/ANALYST POSITION - Requires a BS in a scientific or engineering field and three years' programming experience or MS in computer science. Familiarity with object-oriented methods, UNIX relational databases, computer graphics and network programming is required, as is experience in programming in C (C++ preferred). Responsibilities will include the design and implementation of data-processing and data-validation system for the Protein Data Bank (PDB), the design and implementation of procedures to manage and access data from SYBASE relational database tables, and production of a commercial grade PDB-AUTHORIN program for worldwide distribution. Chemistry Department.

MK 8167. ENGINEERING POSITION - Requires a BS in civil or environmental engineering or a related field, and good interpersonal and communication skills. Will assist in coordinating and monitoring remedial investigation and cleanup activities in the field as part of the Laboratory's CERCLA commitments. Office of Environmental Restoration.

NS 2346. HEALTH PHYSICS POSITION - Requires a bachelor's degree or the equivalent in health physics or nuclear engineering, advanced degree preferred, and several years' pertinent experience. Candidate will participate in addressing a variety of radiation-protection issues for NRC and DOE, including development and review of radiation protection standards, assessment and development of ALARA engineering practices, and assisting in research activities in dosimetry. Will also provide technical support for the BNL ALARA Center. Health physics certification, experience at a nuclear power plant and/or DOE facility, and Q clearance are desirable. Department of Nuclear Energy.

Motor Vehicles & Supplies

91 CHEVROLET CAVALIER Z24 - sports coupe, 10k mi., blue, a/t, 6-cyl., ac, like new, estate sale. Sharon, Ext. 3995.

90 TRAILER - heavy equipment trailer w/elec. brakes, \$2,100. 929-5872 after 6 p.m.

89 T-BIRD LX - all electronic, sunroof, keyless entry, 60k mi., mint cond., asking \$9,200. Camille, 325-1756.

89 GEO METRO - 5-spd., 4-dr., red, 97k mi., ac, am/fm, 50+ mpg, \$2,495. Joe, Ext. 2898.

88 CHRYSLER LEBARON - 4-dr, a/t, ac, cruise, tilt, p/s, p/b, rear defroster, new radial tires, low mi., \$3,200. 722-3905.

88 CHEVY C30 - 9' flatbed, 350, 4-spd., p/s, p/b, dual wheels, R&H, 48k mi., \$5,500. Fred, 878-4254.

87 DODGE SHADOW ES - turbo, 4-dr. h/b, low mi., ac, am/fm cass., p/l, p/s, p/b, white, \$3,200. 567-7752, leave message.

87 HYUNDAI - 5-door h/b, 5-spd., ac, stereo cass., 30+ mpg, blue, new exhaust, v.g. cond., neg. George, 472-1479.

87 MAZDA B2000 - 5-spd., cap, bed liner, 50k mi., recent brakes, tune-up. \$3,900. Dave, Ext. 7268.

86 PLYMOUTH VOYAGER - 2.6L, 4-cyl., 80k mi., v.g. cond. Ext. 4830 or 347-1020 eves.

86 LINCOLN MARK VII - Bill Blass, loaded, excel. cond., \$6,000. Paul, Ext. 4156.

86 FORD ESCORT WAGON - 5-spd., 87k mi., economical, convenient size, runs well, avail. March, \$1,900. Tom, Ext. 7196 or 286-2505.

85 VW SCIROCO - 60k mi., gray, sunroof, all power, new rims, tires, runs well, needs master cyl., \$2,200 neg. Dane, 727-1978.

85 BUICK CENTURY - 4-dr., 77k mi., ac, cruise, am/fm, 30+ mpg, one owner, excel. cond., \$2,000. Larry, Ext. 3506 or 281-2002.

85 SUBARU RX - 5-spd. turbo, 4wd, p/b, 81k mi., \$2,000. 689-3429 eves.

84 MERCURY TOPAZ - 5-spd., runs well, \$650 neg. Mike, 929-8443.

84 HONDA CR-60 DIRT BIKE - good cond., \$500 or best offer. Justin, 281-6605.

83 CRESSIDA - fm stereo cass., ac, loaded, excel. cond., \$2,995. George, Ext. 3262.

83 GRAND PRIX - blue, 67k mi., landau roof, spoke wheels, am/fm cass. stereo, mint cond. in/out, \$2,200. 472-3254.

80 AMC EAGLE - high mi., good for parts, \$100 neg. Richie, 732-9118.

79 FORD FAIRMONT WAGON - 4-spd., R&H, 48k mi., new carb., 2 gas tanks, \$1,000. Ext. 4924 or 286-6858.

79 PONTIAC - runs well, good cond., \$700. Jim, Ext. 3372 or 821-0250.

79 T-BIRD - 20k mi. on new 351 eng., needs tune-up & minor repairs, asking \$300. Diane, 744-5553.

78 DODGE DIPLOMAT - 318 V-8, 4-dr., a/t, 100k+ mi., rebt. trans., new rad., needs rear end, \$200 neg. Don, Ext. 7237 or 744-2921 after 5:30 p.m.

78 CHEVY MONTE CARLO - 350 motor, clean, asking \$1,550. Steve, Ext. 3849 or 929-0586.

77 FORD - 351 M engine & tranny, in car, running, \$250; GM 10-bolt rear end & leaf spring, disc brake, 5x5 lug pattern, \$50. 924-8213 after 6 p.m.

72 VOLVO - new exhaust system, front pads, fuel injected 6-cyl., w/74 parts car, \$650. Ken, Ext. 5110.

66 PONTIAC CATALINA - convertible, 53k orig. mi., good cond., \$4,600; '74 Harley Davidson Sportster, \$2,900. Roger, Ext. 7518 or 878-8847.

61 FORD FALCON - 6-cyl., 2-spd., a/t, all orig., no rot, many new parts, runs well, needs paint, \$1,900. 589-2032.

RADIO - digital w/cass., 2 hi-fi speakers, Audi-ovac, like new, \$50. Ext. 5080.

CLUTCH - '80 Toyota Tercel, 5-spd., \$30 neg. Bob, Ext. 7238.

Boats & Marine Supplies

26' SAILBOAT - 1976 Chrysler, 1991 9.9-h.p. Johnson, swing keel, roomy, clean, sleeps 5, \$5,000. Tom, Ext. 7115.

22' MARSHALL CATBOAT - freshwater-cooled Yanmar diesel, VHF radio, depth sounder, Danforth compass, head. Gordon, 477-2269.

21' CHRIS CRAFT - 1988, Bowrider, i/o Merc., 8'6" beam, canvas, am/fm, bottom not painted, E-Z load trailer, \$11,500. 732-8793.

Furnishings & Appliances

COUCH - Castro, contemp., convertible, w/new slipcover, excel. cond., \$150. Barbara, Ext. 5165 or 234-5847.

MICROWAVE - above stove, auto defrost, light, exhaust fan, minute/second timer, oven shelf, orig. \$400, sell for \$175. Ext. 3992 or 331-1003.

REFRIGERATOR - Whirlpool, 19 cu. ft., new, almond, \$400; gas stove, double oven, Kenmore, almond, \$300, \$600/both. Bob, Ext. 7238.

SOFA BED - workbench, oatmeal fabric, good cond., 70" long, \$100. Ext. 2004.

ANTIQUE ROCKING CHAIRS - maple, custom upholstery, \$50/ea. 722-3905.

ANTIQUE DINING ROOM - 6 chairs, buffet, side board server, \$500. 473-0178.

BATHROOM VANITY - oak cabinet, marble w/Delta faucet, 25"Wx22 1/2"Dx30 1/2"H, excel. cond., \$90. 475-8658 after 3 p.m.

BEDROOM SET - red velvet, Italian provincial, dresser, mirrors, amoire, night tables, king size headboard & frame. Walter, Ext. 4100 or 369-4238.

BEDROOM - maple, full 4-poster bed, dresser, mirror, bureau, 2 night tables. Sharon, Ext. 3995.

BUREAU - 2, old, \$100; large pine table, w/bench, \$150; wood bed, \$60; very old mirror, 35"x33", \$50. 475-4199.

CHAIR - child's rocking chair, wood, light finish, \$25. Charlie, Ext. 2804.

DRYER - Kenmore, electric, works, \$60; humidifier, works, \$25. Roger, Ext. 7518 or 878-8847.

ENTERTAINMENT CENTER - radio, phono, space for TV, storage, speakers, maple, \$150; hutch, country pine, new cond., \$400. 744-3842.

The Brookhaven Bulletin is printed on paper containing at least 50 percent recycled materials, with 10 percent post-consumer waste.



KITCHEN SET - wrought iron, black w/red cushions, v.g. cond., \$95. George, 472-1479.

LOVESEATS - 2, camelback, w/floral design, excel. cond., orig. \$1,400, sell for \$500. Carl, Ext. 4986 or 929-5781.

REFRIGERATOR - GE, 5', \$150; Magic Chef 20" stove, \$45; water bed, queen, w/headboard, \$100; love seat, \$60; armchair, \$10. Kathy, 929-8443.

SINK - kitchen, Kohler, yellow, w/faucet & sprayer, \$30. Helga, Ext. 2384.

STOVE - almond, Kenmore, double oven, top & bottom, \$300 neg. Ext. 7238.

TABLE - Bennington, round, pine, 2 leaves, 4 captain's chairs, 4 side chairs, lazy susan, \$600. R.M. Brown, 286-1214 after 5 p.m.

Tools, House & Garden

COAL STOVE - Surdiac Southport, approx. 30k Btu, excel. cond., black porcelain, \$200 or best offer. Joe, Ext. 5139.

FIREWOOD - seasoned oak. J. Scesny, 732-2849.

LAWN MOWER - Snapper, \$50; men's ice skates, \$20; living room chair, \$30; cane walker, new, \$20; opera book, \$10. Kathy, 744-2203.

PROPANE HEATER - great for garage, \$50; manual tire changer, \$50. Lex, 286-8523.

POWER PAINT ROLLER - Sears, w/all attachments, used twice, \$100; Toro electric snow shovel, \$70. Paula Hughes, 928-7769.

TOOL CHEST - 6-drawers, steel, \$40. Craig, 3932.

Sports, Hobbies & Pets

BOXER PUPPIES - w/AKC papers, 5 male, 2 female, ready to go 3/25. Beth, Ext. 4120.

RACING COLLECTIBLES - die-cast cars, trucks, 1/64 replicas, great investment, collector's items. Joe, Ext. 5320.

DRUM KIT - Slingerlan, 8 pc., 12/13/14/15 concert toms, 16/18 floor toms, 24 bass, Zildjian, Paiste, Sabia, HD hardware, \$1,000. Kevin, Ext. 7316.

FLASH - Minolta, very powerful, w/thyristor control, \$30. Stephen, Ext. 4477 or 924-5510.

GIUITAR - Franciscan Spanish style, nylon strings, w/case, 2 starter books, never used, \$100. Larry, Ext. 4295.

HEALTH CLUB MEMBERSHIP - Jack LaLanne Gold Annual, \$84/yr., payable this June, asking \$300 firm. Susan, Ext. 7318.

HORSES - Reg. QH 10 yr. dun gelding, \$1,700; GH type 9 yr. dun mare, \$1,200, both \$2,700. Beth, Ext. 4986 or 369-4295.

NORDICROW - TBX III, hardly used, excel. cond., top of the line, orig. \$800, sell for \$500. Larry, Ext. 5462.

MOPED - Yamaha, w/helmet, both like new, \$300; extra helmet w/face mask, \$25. Ext. 5080 or 751-1884.

SKIS - K2, 200cm, w/Saloman bindings, \$75; ski boots, Saloman about size 9, \$75. Craig, Ext. 3932.

TREADMILL - Cadence 1000, 2 yrs. old, hardly used, \$150. 399-4169.

Audio, Video & Computers

DESKTOP COPIER - Savin V35, w/chemicals, good cond., \$300. Kathy, Ext. 2267 or 395-6520.

ENLARGER - Vivitar VI, w/color head, enlarging easel, 12"x15" dry mount press, developing tank & reel, more, \$350 neg. Peter Paige, 286-0284.

ATARI GAME SET - many cartridges, best offer. Charlie, Ext. 2804.

CB RADIO - TRC474, 40 channel, w/magnetic antenna, never used, \$50. Steve, Ext. 2897.

COMPUTER - Commodore 128, 1902A monitor, 1571 disk drive, mouse, modem, joystick, software, \$300, trade for IBM printer. Bob, Ext. 7257.

COMPUTER - IBM convertible, portable, color monitor, software, price neg. Ext. 2423.

Miscellaneous

BABY'S CHANGING TABLE - 5 drawers, brown wicker, \$20; white drum toy chest, \$5; Greco infant bathtub; Biltrite high chair. B. Langella, 744-9802.

FIVE-GALLON JUG - from water cooler, full of pennies, \$340. Vic, Ext. 5318.

LUGGAGE SET - 4-piece, Samsonite, pink; wheelchair; walker. Walter, 369-4238.

SODA MACHINE - old Coca-Cola 10¢ bottles, good cond. Joe, Ext. 5320.

Free

CAT - female, tortoise-shell, declawed, spayed, affectionate, needs a good home. Vic, 543-7674.

GOLDEN RETRIEVER - male, 1 1/2 yrs. old, needs loving home, adores children. Beth, Ext. 4120.

Car Pools

BOHEMIA-E.ISLIP-OAKDALE-SAYVILLE - needs 1 more driver, call for interview. Frank, Ext. 2314.

Wanted

BABY-SITTER - for Cooking Exchange, second Wed ea. mo., 11:30-1, Rec. Bldg. 341-1022.

DOGHOUSE - cheap. 821-2854, leave message.

HAY - spoiled, free or cheap, for organic garden. Rich, Ext. 3386.

HUBCAP - for 1990 Chrysler Plymouth Acclaim. Pam, Ext. 5752 or 286-8380.

INFANT CARE - full time, 8:30 a.m.-5:30 p.m., Mon.-Fri., on-site preferred. Shin, Ext. 4360.

LATHE - 10" South Bend or equivalent. Tom, Ext. 2765.

OLD LAWN MOWERS - and tractors, complete. Dan, Ext. 4987.

PEOPLE - interested in flying control-line model airplanes; also, old engines, kits, planes, etc. Mike, Ext. 5030 or 821-4083.

RIDER TO SHARE DRIVING EXPENSES - round-trip from BNL to Pittsburgh, PA on weekends/holidays. Bill, Ext. 3698 days or 2569 eves.

SCUBA DIVERS - for spring dive trip to Cancun. John, Ext. 2769.

SKIERS - to ski Windham 3/17, send \$40 for bus & lift to Augie Hoffmann, Bldg. 510C.

TRAINING WHEELS - for child's bicycle., Pam, Ext. 5752 or 286-8380.

Services

Services are listed in the first Bulletin of every month as a courtesy to BNL employees. They are neither screened nor recommended by the Bulletin. Services forms are available in the Bulletin lobby, Bldg. 134.

AUTOMATIC LAWN SPRINKLERS - free est., prof. layouts, repairs, alterations & additions, prompt courteous service. Lou, 928-7042.

BABY-SITTER - mature high school student seeking steady after school & weekend hours, avail. ASAP. 399-2179.

BALLOONS - for special occasions, deliver your love & affection inside a balloon. 732-1528.

BRICKWORK - masonry, patios, walks, swimming pools, retaining walls, landscaping ties, Belgium block, 25 yrs. exp., Lab disc. Tony, 698-9274.

CARPENTRY - all phases of wood working, fair prices, honest work, very reliable. Philip, 369-9610.

CARPENTRY - dormers, windows installed, extensions, fin. bsmts., gar., roofs, drywall, free estimates. Dennis, 395-6055.

CARPET/UPHOLSTERY CLEANING - spot, pet stains, odor removal, auto interior, fabric protector, free est., Lab discount. Jerry, 924-6019, days.

CHILD CARE - 12 yrs. exp., 4 mi. from Lab, other Lab refs. 821-1558.

CHILD CARE - mother will watch your child or children, my home, snacks, crafts, in/outdoor play, PT/FT, exper. Jen, 369-7704.

DOOR REPAIRS & INSTALLATION - fix that door, interior/exterior, patio & storm doors, lic. & ins. Al, 928-7239.

DJ/MC - party & dance music from 40s-90s, all occasions, music & entertainment personalized for your affair, BNL refs. Lou, 698-8210.

ELDER CARE - on weekends in their home, I give TLC & stay overnight, a break for the family, reasonable. Susan, 286-4225.

ELDER CARE - I will clean home, go/take shopping, doctor, barber, hair salon, etc. reliable. 399-4169.

FACIALS - and glamour makeovers, no obligation. 722-3010.

FLOORS - waxing, stripping, carpets & upholstery shampooed, house cleaning, windows, free est. Leo, 447-6522.

HOME IMPROVEMENTS - carpentry, dry wall, spackling, painting, plumbing, ceramic tile, free est., Lab discount. Don, 744-2921 after 5:30 p.m.

HOME IMPROVEMENTS - all phases, inside & out, no middleman, free est., honest, dependable, reasonable, refs. Tirre, 281-0360 after 6 p.m.

HOME IMPROVEMENTS - complete kitchens & baths, doors, windows, siding, 35 yrs. exp., lic. & ins. Carl, 698-9274.

HOUSE CLEANING - reas., hard working, dependable, honest, refs. Cathi, 281-0360 after 3 p.m.

KAYAK LESSONS - basic & intermediate, 6 weeks, 12-hr. course, starts 4/17, SUNY Stony Brook pool. Ernie, 281-7873.

LAMAZE CHILDBIRTH CLASSES - taught by R.N., M.S. instructor certified by ASPO. Cindy, 929-4993.

LAWN MOWER REPAIR - fast, reliable, all makes, reas. rates. Dan, 698-7322.

LOCKSMITH - sales & service, 10% Lab discount, keys cut during lunch. Pete, 399-2813 after 5 p.m.

PAINTING - interior/exterior, taping, spackling, Sheetrock, wallpaper, staining, polyurethane, insured. James, 399-4912.

PARTIES - make every party a special event, catering & every other detail covered, all size parties, any occasion. Rosalie, 289-5704.

PIANO LESSONS - by master of music teacher, beginners-intermediate. 751-8731.

PLUMBING & HEATING ALTERATIONS - repair work by Jim Morris, retired BNLer. 472-1205.

POOL TABLE RECOVERY & REPAIR - choose from 27 custom colors. Philip, 369-9610.

SHEETROCKING & SPACKLING - free est. Kevin, 563-9855.

SKYLIGHTS - complete, prof. service, cleaning, preventive maint., installations. Joseph, 924-6019.

STUMPS/TREES/BRUSH REMOVED - yards selectively cleared & raked using JD-450 Loader. Tom, 878-1060.

TAXES - 4 yrs. exp., forms typed, N. Patchogue. Nick Scala, 475-8330