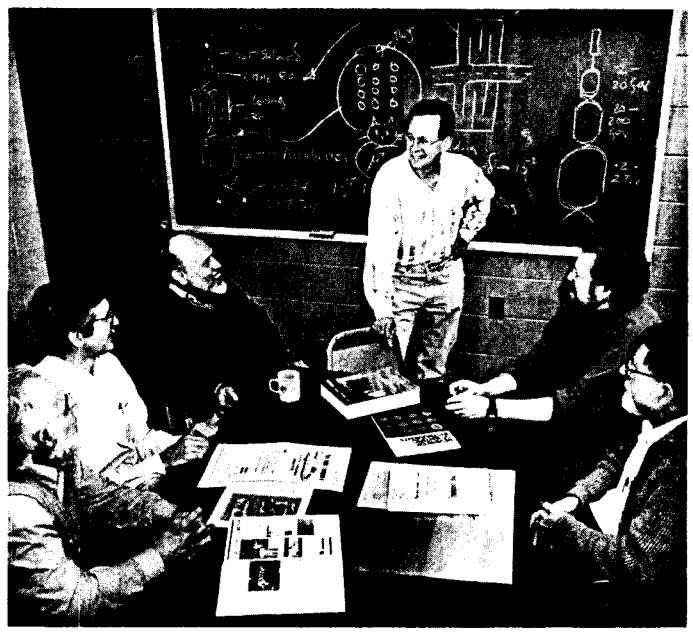
BROOKHAVEN BULLETIN
Vol. 49 - No. 13 March 31, 1995
BROOKHAVEN NATIONAL LABORATORY

BNL and Collaborators Propose New Muon Collider Concept To Complement Electron and Hadron Machines

A significant step toward the far frontier of high energy physics was taken on March 22, when a BNL team visited U.S. Department of Energy (DOE) headquarters in Washington, D.C., to discuss developing a highly advanced probe for scientific exploration — a muon collider.

At the meeting, the BNL team of Thomas Kirk, Associate Director for High Energy and Nuclear Physics, and Robert Palmer, who heads the Lab's Center for Accelerator Physics, showed a new design for a muon collider developed by Palmer and David Neuffer of the Continuous Electron Beam Accelerator Facility, to DOE's Wilmot Hess, Associate Director, Office of High Energy and Nuclear Physics; John O'Fallon, Director, High Energy Physics Division; and a group of about 20 staff.

Alvin Tollestrup and Robert Noble of Fermi National Accelerator Laboratory (Fermilab) were on hand to represent the larger collaboration of scientists now working on the scheme; and Vernon Barger, University of Wisconsin, presented a talk on the physics such a machine would produce.



Robert Palmer (standing) discusses the muon collider with some members of the BNL team: (from left) Juan Gallardo, Richard Fernow, Harold Kirk, David Winn and Gerry Morgan.

Photo by Roger Stoutenburgh

"The meeting went well," reported Kirk, "and we are hoping for support for the research and development that will be needed."

In a muon collider, two beams of these heavy, weakly interacting particles of the lepton family — one positively and one negatively charged — would intersect at energies of up to 2 trillion electron volts (TeV) each.

Said BNL Director Nicholas Samios, "This new concept of colliding muons — particles with lifetimes of 2.2 microseconds — is truly innovative and exciting. It validates our belief in the worthiness of the Center for Accelerator Physics, which we established over eight years ago in the expectation that it would produce new and novel ideas for new accelerators. This concept of a muon collider is one such product, which is ripe for exploring in some depth and, it is hoped, will provide the foundation for exploring the multi-TeV range of particle physics — a truly exciting physics prospect."

The Muon Advantage

The concept of a muon collider, discussed by John Tinlot in the 1950s, was first proposed by Gersh Budker and Alexander Skrinsky, and independently by Neuffer, in the 1970s. But these colliders would have had relatively small luminosity — that is, they would not have made a large number of the events of interest. In the past two years, a resurgence of interest in the idea has prompted two workshops, many papers and the collaboration that led to the high-luminosity design presented to DOE (see story below).

While muons and electrons both are leptons, muons are more than 200 times heavier than electrons. This heaviness suppresses much of the synchrotron radiation that is generated when electrons are deflected. While synchrotron radiation is the basis for such vital machines as BNL's National Synchrotron Light Source, it can be a problem in the electron-positron collider, a machine being developed in which an electron beam collides with an anti-electron, or positron, beam.

However, muons can be accelerated and stored in a comparatively

(continued on page 2)

Haworth Distinguished Lecture

Insights Into Structural Biology

Donald Caspar has built his distinguished 40-year career on investigations into the structure and function of viruses and other macromolecular assemblies, which are built from regularly arranged protein structural units. From his student days at Yale to his long tenure at Brandeis, and now as a professor at Florida State University (FSU), Caspar has made major contributions to structural biology.

Donald Caspar with a model of the surface lattice of the polyomavirus, whose structure has been studied in his laboratory.

As a Haworth Distinguished Scientist, Caspar will share some of his insights in the field with BNL staff next month, when he will spend two weeks in the Biology Department, in the first year of this two-year appointment. A highlight of his stay at BNL will be a Labwide lecture entitled "Protein Adaptability, Quasi-Equivalence and Switching in Virus and Crystal Structures," on Wednesday, April 5, at 4 p.m. in Berkner Hall.

"Current research in structural biology is providing detailed pictures of the arrangements of atoms in protein molecules, which function as the machinery and fabric of living structures," said Caspar. "But understanding how these protein molecules move to carry out their functions is still a challenge. The way scientists discover how living structures behave involves the same kind of trial-and-error process that is involved in biomolecular activity."

In his Haworth lecture, Caspar will discuss the development of ideas about how virus particles self-assemble and how protein molecules can move in ordered arrays. He will trace the history of structural biology of protein assemblies with personal recollections from his days at Cambridge University in the mid-1950s to reflections on today's protein crystallography.

While in residence at BNL, April 1-11, Caspar will work on x-ray scattering experiments with Robert Sweet, Biology, and FSU postdoctoral students at X12C, one of several structural biology beam lines at the National Synchrotron Light Source.

On Monday, April 3, and Thursday, April 6, interested employees are invited to join Caspar for afternoon tea at 3 p.m. each day in the small conference room of Bldg. 463, to discuss emerging themes in structural biology and related topics.

Caspar will also deliver a Biology Department Seminar on "Electrostatic Interactions and Structural Transitions in Cubic Insulin Crystals" in the large conference room, Bldg. 463, on Friday, April 7, at 11 a.m.

Caspar received his B.A. in physics from Cornell University in 1950 and his Ph.D. in biophysics from Yale University in 1955. After doing postdoctoral work at the California Institute of Technology and the MRC Laboratory of Molecular Biology in Cambridge, England, Caspar taught biophysics at Yale and then did

(continued on page 2)

Muon-Collider Design and R&D

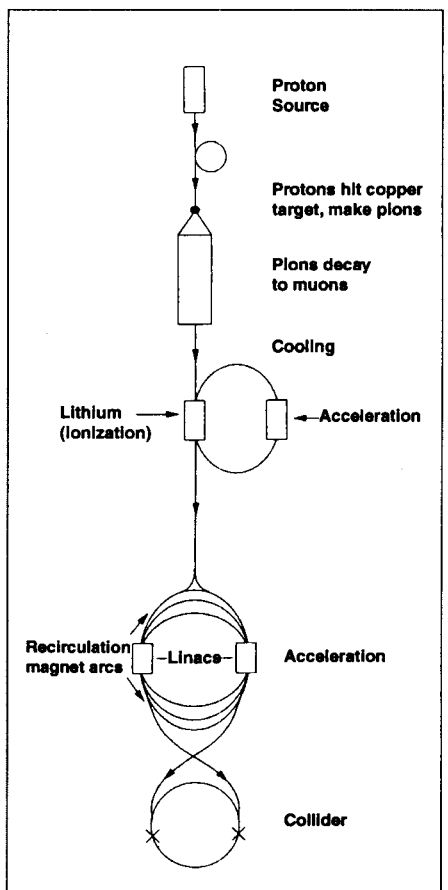
The Robert Palmer/David Neuffer muon collider design (see story above) calls for the production, cooling, acceleration and collision of two muon beams, one positively and one negatively charged. Two energy levels are being considered: a first-phase machine at 250 billion electron volts (GeV) and a super-high energy machine of 4 trillion electron volts (TeV).

For the last year, a collaborative team has been looking at the beam dynamics problems that can be expected in this highly advanced new physics machine. From BNL, Palmer and Neuffer have been joined by: Richard Fernow, Juan Gallardo, Harold Kirk, Y.Y. Lee, Iuliu Stumer, Mike Syphers and Yagmur Torun; together with David Winn, Fairfield University; Yang Cho and James Norem, Argonne National Laboratory; Nikolai Mokhov, Robert Noble and Alvin Tollestrup, Fermi National Accelerator Laboratory; Ronald Scanlan and Shlomo Caspi, Lawrence Berkeley Laboratory; and Olivier Napoly, Saclay, France.

These researchers have discussed muon-collider systems, starting from the proton accelerator needed to generate the muon beams and proceeding through the muon storage ring.

Said Palmer, "It appears that most of the necessary technology is in hand in some form, although we could be using it in novel ways. No hidden snags seem to have emerged in the simulations done so far."

For example, Palmer said, the muon collider would use a proton source running at 10 GeV and 30 hertz (Hz), similar to that proposed for a kaon machine at Vancouver, Canada. Already, a 30-Hz machine exists for a spallation neutron source at Argonne National Laboratory.



Design for a Muon Collider

The protons would hit a copper target and make pions. A very high magnetic field of 28 teslas (T) would be needed to capture the pions — but a 35-T field magnet at the Massachussetts Institute of Technology is already working and a 45-T field magnet is being built at Florida State University at Tallahassee.

Pions decay into muons, which tend to diffuse, so they must be subjected to ionization cooling to reduce the size of the beam. This technique has not yet

(continued on page 2)

Leaving the Lab — After 35 Years or More

The Bulletin salutes employees who retire with 35 or more years of service to the Laboratory.

Barbara Fitzgerald has worked at BNL for 37 years, but she isn't a Lab employee. Impossible? Not at all — Fitzgerald has spent her career working for the three successive federal agencies that have overseen BNL's activities, the most recent of which is the U.S. Department of Energy (DOE).

From her arrival as a secretary in the office of the Atomic Energy Commission (AEC) in 1958, to her present position as a contract specialist in the DOE's Brookhaven Area Office (BHO), Fitzgerald has seen the Lab grow and change as much as any BNL employee. And now that she's retiring today, March 31, she looks back on her time here and ahead to a fulfilling retirement.

Growing up in Queens, Fitzgerald knew the area around what was to become BNL from vacations at her family's summer house in Mastic Beach. So, years later, when she was laid off from a secretarial job, she didn't hesitate when the state unemployment office told her about jobs at the Lab.

She began in 1958, working for the AEC office's construction staff. "I took it as a temporary job, and 37 years later. . . ," she says. "And if I had to do it over again, I would."

In 1964, Fitzgerald moved up to become the secretary and administrative assistant to the Area Office's Manager, Emery Van Horn. One of her duties was to administer the AEC's part of BNL's foreign visitors program, which required AEC approval during Cold War times. At the same time, she took courses at Suffolk Community College toward an associate's degree in business administration, which she earned in 1971.

Even when AEC gave way to the Energy Research and Development Administration (ERDA) in 1975, and ERDA yielded to the newborn DOE in October, 1977, Fitzgerald continued

Roger Stoutenburgh

Barbara Fitzgerald

as administrative assistant in the manager's office. While the structure of the agencies' headquarters office has changed dramatically, Fitzgerald said, the office's function has essentially stayed the same — to deal directly with the Lab's staff while administering the contract with Associated Universities, Inc.

Fitzgerald became even more involved with that contract in 1979, when she became a contract specialist with the BHO. Ever since, she has overseen DOE matters in several contract areas: the Work for Others program, technical information, educational programs and property management. She has also been responsible for DOE's part of the farmer's market and the Red Cross' use of the kitchen in Bldg. 490 to prepare meals for housebound, elderly Suffolk County residents.

Work for Others allows Lab scientists to perform research and development for other federal agencies and private companies. It's also one of the largest DOE programs in terms of revenue, accounting for $41.6 million of activity at BNL alone. More than $40 million of that comes from projects managed through over 300 interagency agreements, many with the Nuclear Regulatory Commission. Nonfederal agencies and industry account for over a million dollars more.

In her position, Fitzgerald reviewed proposals for such work, as well as questionnaires that Lab researchers must submit with the proposals. Each one must be checked carefully for compliance with regulations before being approved or sent back for changes.

"People say, 'Thirty-seven years in one place?', but, to me, it hasn't been boring, and it doesn't seem that long, since I was always doing interesting and different work," she said. "I never really had the desire to leave: It was the best of all worlds!"

Now that she's retiring, Fitzgerald hopes to pursue some of her many hobbies, including gardening, sewing, crafts, sailing and beachgoing. She also expects to travel, visiting relatives in Ireland. But first, Fitzgerald is imparting some of her collected knowledge to her colleagues and saying goodbye to everyone she's come in contact with. "I really have enjoyed all the wonderful people I've worked with at the Lab and in this office," she said. "It's like family." — Kara Villamil

Muon Collider (cont'd)

small ring without the two costly, full-energy linear accelerators needed in an electron-positron collider. Also, muons are believed to be "point" particles, not made up of quarks as are protons. So muons do not split up the energy load at the point of collision, and they attain much higher energies.

"So," said Palmer, "at four TeV, a muon machine would have an energy reach comparable or greater than that of the SSC, yet be about ten times smaller."

Potentially, the Palmer and Neuffer design will deliver two fundamental requirements of forefront particle physics — exceedingly high energies and great luminosity — providing vital advantages in the search for the elusive particles that remain to be discovered.

One of these long-sought unknowns might be a supersymmetric Higgs boson, a particle whose relationship with other particles is expected to explain their mass. While this key particle would be hard to observe with an electron collider, it would be a likely prospect for direct observation in a muon collider at a first-phase energy of 200 billion electron volts (GeV), Palmer said.

Another muon-collider advantage is that the spread of energy of the collisions could be made far smaller than in an electron-positron machine, making the results easier to interpret.

The Electron Complement

"However," cautioned Palmer, "the advantages of muon colliders do not detract from the need for an electron-positron machine, which produces simple, single-particle interactions with little background — an essential property in exploring new particle states."

Muon colliders would suffer from high backgrounds not found in electron machines. Due to extra particles formed by the muons' decay, researchers could find it hard to distinguish the particles of interest resulting from the collisions of muon beams, although last February, a workshop group concluded that this problem should be manageable. As a compensating factor in favor of the muon machine, fewer corrections to offset radiation and associated physics backgrounds would be needed.

On the other hand, an electron machine will have an advantage in experiments where polarization — all the particles pointing in the same direction — is required, Palmer said. This is because a high-intensity polarized muon beam is very hard to obtain.

"We feel that the two types of collider complement each other, just as hadron accelerators have always proven complementary to electron machines," stated Palmer. "However, the great interest of the muon collider is that it appears practicable to produce a four-TeV machine with a very high luminosity, using no exotic new technologies. The magnetic and accelerating fields would be no higher than those used now, but we've put them together in unusual ways. Much work remains to be done, but, so far, progress is encouraging." — Liz Seubert

Haworth Lecture (cont'd)

research at the Children's Hospital Medical Center, the Children's Cancer Research Foundation and Harvard Medical School in Boston, 1959-73.

From 1972-94, Caspar was professor of physics and structural biology at Brandeis University. Last year, he joined the faculty of FSU.

Caspar's association with BNL began in 1972, as a guest research associate in Biology. He served as a member and Chairman of the Biology Department Visiting Committee, 1974-77, and he is currently a member of three BNL committees: the Neutron Advisory Committee and Scanning Transmission Electron Microscope Facility Advisory Committee, both in the Biology Department; and the Physics Department's High Flux Beam Reactor Program Advisory Committee.

Elected a member of the National Academy of Sciences last year, Caspar received the coveted Fankuchen Award from the American Crystallographic Association in 1992. Since 1988, his research has been supported by an Outstanding Investigator Grant from the National Cancer Institute.

The Haworth Distinguished Scientist appointments honor the memory of BNL's second director, Leland Haworth. Haworth scientists reside at BNL for one to three weeks each year, for up to three consecutive years.

Design and R&D (cont'd)

been demonstrated, but the muons would pass through a material such as lithium to lose forward and transverse momentum. Then, they would be reaccelerated in a linear accelerator, which would restore the longitudinal, but not transverse momentum, thus narrowing the beam. This would be repeated 20 times.

After this cooling process, the muons must be accelerated relatively rapidly to the multi-TeV energy required. This would be done in a succession of recirculating accelerators, like the one at the Continuous Electron Beam Accelerator Facility. The multiple return arcs of these machines would employ a specially designed magnet of 20 separated coils to keep the 20 pathways apart; guest scientist Gerry Morgan, recently retired from BNL's Relativistic Heavy Ion Collider Project, is working on this.

Then, the muons would be accelerated into the collider ring, where detectors would track the collision results. The largest recirculating accelerator would have a circumference of about 13 kilometers (km), and the final collider itself, only six km.

These dimensions are small compared with the roughly 85 km that had been planned for the Superconducting Super Collider, or with a linear collider of the same energy, which, with current technology, would be about 100 km long. And, of course, a relatively small-sized machine would also be likely to cost less. — L.S.

Graduate School Fair Set for Tomorrow

A Graduate School Fair in Science and Engineering will be held in Berkner Hall tomorrow, Saturday, April 1, from 9 a.m. to 4 p.m. Sponsored by BNL's Office of Educational Programs, the fair is free and open to the public — particularly anyone interested in applying to graduate school in science or engineering.

Graduate schools participating in the fair include: Adelphi University, Carnegie Mellon University, University of Connecticut, Georgia Institute of Technology, Western Illinois University, University of Iowa, Loyola University of Chicago Medical Center, North Carolina State University, Polytechnic University, Princeton University, Rutgers University, Vanderbilt University and Yale University. The schools' representatives will provide information about their programs and available financial support.

From BNL staff, fairgoers will also learn about career opportunities in science and engineering, in such fields as biology, biomedical science, chemistry, computer science, engineering, mathematics and physics.

For more information, call Robert Thomas, OEP, Ext. 4385.

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

Service Awards

The following employees celebrated BNL service anniversaries in March:

35 Years

Antone B. Chituk Jr. ..... Medical
Walter L. Hensel ..... AGS
Russell F. Lowell ..... AGS

30 Years

William E. Anderson ..... AGS
Kenneth R. Asselta ..... Physics
Clarence E. Barrett ..... Chemistry
Charles W. Carlson ..... Physics
Horst W. Foelsche ..... RHIC
John T. Niemczyk ..... Plant Eng.
Gary A. Smith ..... AGS

25 Years

Gerard E. Tanguay ..... Reactor

20 Years

Mattie L. Brown ..... Sup. & Mat'l.
Elizabeth E. Gilbert ..... Adv. Tech.
Elizabeth A. Mogavero ..... Physics
Antonino Realmuto ..... SEP
Nereida Santiago ..... Adv. Tech.

10 Years

James B. Calcanes ... Comp. & Comm.
Joseph F. Carbonaro ..... Adv. Tech.
Ralph R. Fullwood ..... Adv. Tech.
Stephen E. Gushue ..... Chemistry
Stuart H. Kern ..... Comp. & Comm.
Stewart Mandell ..... AGS
Zohreh Parsa ..... RHIC
Triveni Srinivasan-Rao ..... Instrum.
Diana Teich ..... Con. & Proc.

Coming Up

The final BERA concert of the 1994-95 season will feature outstanding young musicians from the State University of New York at Stony Brook. It will be held on Wednesday, April 12, at 8 p.m., in Berkner Hall. A $6 donation is suggested.

•

Martha Haynes, Professor in the Department of Astronomy at Cornell University, Collaborative Research Scientist at the National Radio Astronomy Observatory and member of the Board of Trustees of Associated Universities, Inc., will deliver the next Brookhaven Women in Science Seminar on Thursday, April 13. Her talk on "Mapping the Universe in Three Dimensions" will begin at 3 p.m. in the Hamilton Seminar Room in the Chemistry Department, Bldg. 555.

To join Haynes for lunch at the Brookhaven Center at 12:30 p.m. that day, contact Eva Bozoki, Ext. 3701.

•

"An Evening of Art and Science With Diane and David Bouchier," featuring the botanical paintings of Diane and incisive remarks by David, will be sponsored by the BERA Art Society on Thursday, April 20, from 5:30 to 8 p.m., in Room B and the lobby of Berkner Hall. The paintings will remain on exhibit the next day from 11:30 a.m. to 1:30 p.m.

Be Social Soon

The next informal monthly social sponsored by the BNL Ballroom, Latin & Swing Dance Club will be held on Saturday, April 8, at 8 p.m. in the North Ballroom of the Brookhaven Center. All are invited to fox trot, lindy, mambo, waltz, etc., the night away to CD music. The suggested donation of $1 per person goes to the club's music fund. For more information, call John Millener, social chairman, Ext. 3853.

Software Demo

The mechanical design software Pro/Jr.will be presented by representatives of Parametric Technology Corporation on Wednesday, April 5, at 10 a.m. and 1:30 p.m. in the Seminar Room, Bldg. 515. Pro/Jr. is a full-feature package with 3-D modeling capabilities. For information and registration, call Chris Neuberger, Ext. 4160.

Note to Employees:

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

BROOKHAVEN BULLETIN

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

ANITA COHEN, Editor
MARSHA BELFORD, Assistant Editor

Bldg. 134, P.O. Box 5000
Upton NY 11973-5000
Tel. (516) 282-2345; Fax (516) 282-3368

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

Winter ended earlier this month, on March 20, having dropped only 16.5 centimeters (cm) (6.5 inches) of snow on BNL over the entire season — the fewest flakes the Lab has seen except for the winter of 1972-73, when 14.5 cm (5.7 inches) fell. In contrast, last year saw 139.7 cm (55 inches) of snow on site, while the most snow — 190.5 cm (75 inches) — drifted down during the winter of 1966-67. A "normal" snowfall would be 73.66 cm (29 inches), says BNL meteorologist Victor Cassella, who provided this data. To satisfy any unfulfilled yearning you may have to see the Lab covered in snow, the Bulletin offers this photo taken by BNL Photographer Roger Stoutenburgh in January 1994.

Walk With BERA

BERA is sponsoring participation in two fund-raising walks:

For Multiple Sclerosis

On Sunday, April 23, for the first time, BERA is joining the MS Walk for Multiple Sclerosis (MS) to help raise funds for the National Multiple Sclerosis Society.

For March of Dimes

BERA members can join the 25th March of Dimes WalkAmerica for Healthier Babies on Sunday, April 30, and help support efforts to reduce infant mortality and the incidence of low birthweight.

Pick up registration forms at the BERA Sales Office in Berkner Hall, weekdays from 9 a.m. to 1:30 p.m.

To make a donation, make check(s) payable to the MS Society and/or the March of Dimes. Mail to the Recreation Office, Personnel, Bldg. 185, or drop off at the BERA Sales Office.

If you have any questions, call Andrea Dehler, Ext. 3347, or M. Kay Delimore, Ext. 2873.

Arrivals & Departures

Arrivals

Craig D. Fisher ..... Medical
Laura J. Jones ..... Saf. & Env. Prot.

Departures

This list includes all employees who have terminated from the Lab, including retirees:

Kai Hu ..... Adv. Tech.
Edwin I. Njoku ..... Saf. & Env. Prot.

Spring for Aerobics

With the spring softball and summer swimsuit seasons just around the corner, now's the time to sign up for the next ten weeks of BERA aerobic dance and stretch classes.

Aerobics, to be held in the Recreation Building in the apartment area at 5:15 p.m. on Tuesdays and Thursdays, begins on April 4. Wednesday stretch classes held at 5:15 p.m. in the Physics lounge, Bldg. 510, begin April 5.

The $30 fee for each 10-class session is payable at the first class. For more information, call instructor Pat Flood, Ext. 7886, or Kara Villamil, Ext. 5658.

Healthline Lecture
Understanding Arthritis

Arthritis is more than one disease characterized by inflammation of the joints, which affects approximately 37 million people in the U.S. and 440,000 Long Islanders annually. Still not curable, these rheumatic diseases are more successfully treated now than in the past — especially if treatment is begun early.

To introduce BNLers to the different types and treatments for these all too-common disorders, the Healthline series will offer two consecutive lectures. The first, on "The Medical Aspects of Arthritis," will be delivered on Tuesday, April 4, by physician Ronald Bennett; the second, on "Arthritis: Coping Strategies for Myself or Others" will be presented by Shirley Haubner of the Arthritis Foundation, on Tuesday, April 11. Both lectures will take place from noon to 1 p.m. in Berkner Hall and are sponsored by the Health Promotion Program (HPP) of the Occupational Medicine Clinic. All are invited.

On April 4, Bennett will differentate among the different rheumatic diseases, including rheumatoid arthritis, osteoarthritis, gout, spondylites and systemic lupus erythematosus. He will also review their medical treatment, including pain management.

A diplomate of the American Board of Internal Medicine in the subspecialty of rheumatology, Ronald Bennett has a private practice limited to rheumatology in Port Jefferson Station. He is Vice Chairman of the Board of Trustees of the Long Island Arthritis Foundation.

On April 11, Haubner will discuss self-help tips for arthritis sufferers, offer pointers for assisting others with the diseases, explain how to adapt household items to the special needs of people with arthritis and present motivational techniques for encouraging those with the disease.

Shirley Haubner began volunteering with the Arthritis Foundatin because members of her family have the disease. She is a self-help course leader, a member of the foundation's speakers' bureau, and an in-service instructor for home health-care workers.

To register for one or both talks, return the completed bottom portion of the Healthline flyer recently sent to all employees to Health Promotion Specialist Mary Wood, Bldg. 490, by the Monday before the lecture. For more information about HPP, call Ext. 5923.

Swim Lessons

Sign up now at the BNL pool, Bldg. 478, for swim lessons for both children and adults. In addition to the lesson fee, participants must either purchase a season pool pass or pay the $2 daily pool fee. For more information, contact Susan Juzwak, Ext. 3147, after 4 p.m.

. . . For Children

Eight weeks of swimming lessons for children will be offered on Tuesdays and Wednesdays from 4 to 4:45 p.m. Advanced beginner and intermediate lessons will begin on Tuesday, April 11. Beginner and advanced beginner lessons will begin on Wednesday, April 12.

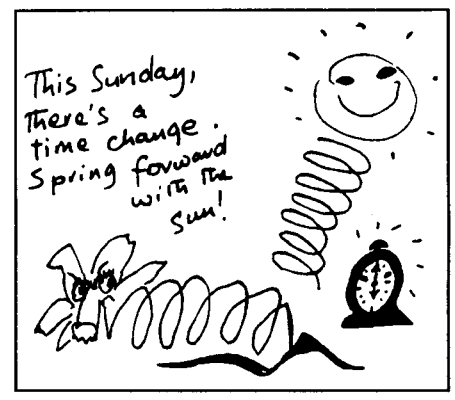
A minimum of ten children is needed for each session, and a maximum of 20 will be allowed. Red Cross certification will be awarded to children who meet the requirements by the end of the class. The cost is $35 per child.

. . . For Adults

Adult swimming lessons for beginners and intermediates will be offered for eight weeks, 5:15-6:15 p.m., on Wednesdays, April 12-May 31. The cost is $40.

Archery Club

The Archery Club will hold its next monthly meeting on Thursday, April 6, at noon, in the large seminar room of Physics, Bldg. 510. New members are welcome. For more information, call Bill Schoenig, Ext. 2377.



AutoCAD Training

The Computing & Communications Division (CCD) will offer basic computer-aided design training using AutoCAD R12, for ten half days, either mornings or afternoons, during the weeks of April 24 and May 1. Since class size is limited, participants will be admitted first come, first served. Contact Chris Neuberger, Ext. 4160, for registration and fee information.

Pool Schedule

The new, three-month schedule at the swimming pool will begin on Saturday, April 1, and end on Friday, June 30. Tickets may be purchased at the pool during open hours:

Open Hours

- **Monday through Friday**

11 a.m. - 1:30 p.m.	employees only
1:30 p.m. - 2 p.m.	reserved for speed swimming and training
5 p.m. - 9 p.m.	employees, families, guests*

- **Saturday & Sunday**

1 p.m. - 5 p.m.	employees, families, guests*

Fee Schedule

- **Daily Admissions**

employee or family member	$2.00
guest	$3.00

- **Season Tickets** (fees not prorated)

Individual	$40.00
Family	$50.00

Guest ruling: One guest per employee is permitted without prior arrangement. Advance arrangements for additional guests, up to five per employee at one time, must be made at the Recreation Office, Personnel Division, Bldg. 185. Guests must be accompanied by the sponsoring employee.* **The pool is closed on all Lab holidays.

Rifle & Pistol Club

The Rifle & Pistol Club meets on the second Wednesday of each month, so the next scheduled meeting is April 12, in Room 202, Bldg. 911B, at noon. Anyone interested in club activities may call Otto Jacobi, Ext. 3471.

Volleyball

Standings of March 28

*Open League		*League 1	
GTEAM	51-21	Rude Dogs	50-22
The Men and Me	50-22	Koopas	49-23
Farside	42-30	Network News	43-29
The Roofing Co.	31-41	Underdogs	23-49
Bud Men	6-66	Safe Sets	15-57
League 2		***League 3**	
Fossils	46-14	Silver Bullets	54-9
Safe Sets II	40-20	Take Five	51-12
Mon. Night Live	36-24	High Volley'em	33-29
Net Wits	33-27	Upton-Ups	32-31
Jolly Vollies	29-31	DO-DAT	27-36
Spiked Punch	26-34	For Play	24-39
Nuts & Bolts	23-37	Bonnie's Bombers	19-43

*final

Bowling

Red and Green League

H. Arnesen 278/203/631 scratch series, R. Mulderig Sr. 257/243/690 scratch, R. Mulderig Jr. 257/232/681 scratch, E. Larsen 244, J. Griffin 232/218/615 scratch, R. Raynis 229/213/636 scratch, G. Mack 231, A. Warkentien 230/600 scratch, J. Cuccia Jr. 224, B. Giuliano 224, K. Asselta 222, J. Goode 213, R. Eggert 207, B. Cahill 204, J. LaBounty 204, E. Meier 200, A. Liotta 200.

Purple and White League

D. Botts 226/193, C. MacDougal 223, Diana Fisher 216, E. Sperry IV 216, E. Sperry III 215, K. Batchelor 202, A. Pinelli 201, J. Butler 198, J. McCarthy 198, S. DiMaiuta 193, M. DiMaiuta 190/177, B. Belligan 189/186, S. Frei 189, J. Sheehan 186/185, P. Wynkoop 186, T. Farmer 184, E. Meier 183/180, J. Addessi 181, M. Haller 171, P. Pozzoli 171.

Basketball

Games of March 23

Scram 47		Deep Six 44	
Al Boerner	15	Brian Hobson	16
John Duggan	15	Calvin Butts	11
Steve Nappi	10	Tracey Fountaine	9
Tim Powers	7	Neil Tyler	5
		Charles Bennett	3

Three-point shots: Nappi (2), Boerner, Butts

Mustangs 74		Runaways 55	
Wayne Cummings	22	Jim Desmond	21
Greg Mack	10	Chris Ingoglia	10
Jerry Cook	9	Pete Ratzke	8
Jamie Sims	8	Gerry Shepherd	6
Steve Springston	8	Neil Donahue	4
Charlie Edwards	7	Ron Mayo	4
Rich Domenech	6	Jerry Gaeta	2
Lars Furenlid	4		

Three-point shots: Desmond (2), Domenech (2), Cummings

Magic 74		Air America 60	
Terry Buck	23	Doug Aichroth	26
Troy Mayo	20	Angelo Bosco	12
Mitch Williams	17	Louis Lalor	8
Dennis Ryan	5	Kevin Woodson	7
Al Langhorn	4	Jeremy Middleton	4
Ed Gregory	2	Alex Ratti	2
Carlos Victoria	2	Ed Calhoon	1
Fred Maier	1		

Three-point shots: Williams (4), Aichroth (2), Buck (2), Bosco

Regular Season Final Standings

Mustangs	9-1	Runaways	4-6
Scram	7-3	Deep Six	2-8
Magic	7-3	Air America	1-9
Night Court	7-53	Harlem Knights	11-52

Cafeteria Menu

Monday, April 3

Soup: Three-bean w/turkey	.90/1.20
A la Carte: Steak w/black bean chili	3.95
Lite: Ham & mushroom crepes	3.85
Deli: Leg of lamb	3.20
Grill: Eggplant Parmesan	3.30

Tuesday, April 4

Soup: Steak & vegetable	.90/1.20
A la Carte: Turkey Parmesan	3.65
Lite: Stir-fry curried shrimp & rice	3.95
Deli: BBQ brisket of beef w/veg. slaw	3.20
Grill: Turkey steak w/raisin sauce	3.30

Wednesday, April 5

Soup: Tomato	.90/1.20
Display Cooking: Fresh sauteed pasta	4.75
Deli: Pork w/rum-lime glaze	3.20
Grill: French dip	3.30

Thursday, April 6

Soup: Cream of corn	.90/1.20
A la Carte: Shepherd's pie	3.65
Lite: Vegetable lasagna w/pesto marinara	3.65
Deli: Turkey w/apple-mustard sauce	3.20
Grill: Tuna Nicoise	3.30

Friday, April 7

Soup: Winter vegetable	.90/1.20
A la Carte: Chicken w/hot peach relish	3.85
Lite: Shrimp & forest-mushroom quiche	4.10
Deli: Pastrami Dijonnaise	3.20
Grill: Tex Mex taco bar	3.30

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.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside candidates.

LS 0050. BIOLOGY ASSOCIATE POSITION - (term appointment) Requires a BS degree and several years' laboratory experience in molecular biology, biochemistry and microbiology. Computer skills are highly desirable. Responsibilities include working on a cotton genome project involving large-scale DNA sequencing, genome mapping and gene identification. Must be willing to work flexible hours and take part in greenhouse and field work. Biology Department.

LS 0051. RESEARCH SERVICES ASSISTANT - (part-time/term appointment) Must possess demonstrated organizational skills and be willing to work weekends. Responsibilities include field work, watering and the feeding of fish. Biology Department.

NS 3816. ENGINEERING POSITION - Requires MS in health physics, a comprehensive working background in health physics and knowledge of industrial hygiene and safety. A working knowledge of accelerators and past supervisory experience are pluses; ABHP certification is desirable. Safety & Environmental Protection Division.

Motor Vehicles & Supplies

92 GEO METRO - 16.5k mi, 3 yrs. left on warr., 5-spd, 45 mpg, am/fm. Joe, Ext. 4496.

92 TRAILER - galvanized, 4.80x12 tires, 1,200 lbs. cap., mint cond., $450. Dean, Ext. 4677.

91 BUICK LE SABRE - 4-dr., 6-cyl., 40k mi., full power, custom roof & trim, orig. owner, excel. cond., $11,950. Peter, Ext. 4235.

90 MITSUBISHI ECLIPSE GS-DOHC - white, ac, a/t, alarm, sunroof, cruise, p/w, p/l, 44k mi., good cond., $7,000. 475-1004.

89 JEEP CHEROKEE - 4-dr., 4.0L, 4wd, a/t, p/s, ac, roof rack, 84k mi., new tires, batt. & exhaust, excel. cond., $8,400. Chris, Ext. 2022 or 395-6112.

89 CHEVY CELEBRITY EURO SPORT - s/w, V-6, 3rd seat, ac, stereo, 58k mi., excel. cond., $5,900. Kai, Ext. 1003/2251.

88 NISSAN PULSAR - T-top, 5-spd., silver, good body, needs eng., best offer. Jim, Ext. 2432 or 821-9178.

88 OLDS FIRENZA - a/t, full power, cruise, ac, 4-dr., 90k mi., excel. cond. Arnie, Ext. 2606.

88 PONTIAC SUNBIRD - a/t, p/s, p/b, 67+k mi., ac, am/fm cass., fog lights, sport mirrors, silver metallic, asking $4,500. Hankes MC, 941-4011.

87 BMW 325 - 4-dr., 117k hwy. mi., orig. owner, new tires, batt. & exhaust, excel. cond. Ext. 3926.

87 NISSAN STANZA - good body for parts, 1½ yr. old tires, blown motor, neg. Kiesha, Ext. 4401.

87 HONDA REBEL MOTORCYCLE - 450cc, candy-apple red, low mi., gar., orig. owner, mint cond., many extras, must see. 473-7667.

86 CORVETTE - loaded, full power, a/t, red, 28.5k mi., excel cond., $14,000 neg. Tom, Ext. 5899.

86 ISUZU IMPULSE - new motor, excel. body, black, 2-dr., 5-spd., cruise, am/fm stereo, ac, leaving BNL, must sell, asking $1,900. Ext. 5704 or 399-7309.

85 BUICK PARK AVENUE - very clean in/out, 10k mi. on new motor, needs trans. work, $1,500. 543-8153.

85 LINCOLN TOWN CAR - white, red int., 5.0 liter od., v.g. cond. Bob, Ext. 2710 or 467-4222.

84 ESCORT WAGON - runs well, $500 neg.; 78 Olds 88, looks good, runs well, $400 neg. Ext. 7897 or 331-0807.

84 OLDSMOBILE CUTLASS SUPREME - needs engine work, make offer. Marie, 589-3020.

84 FORD E150 VAN - 6-cyl., 300 cu.in., 3-spd. od., p/b, p/s, no windows, some rust, $1,100 neg. Bill, 281-6498.

84 GMC JIMMY - full-size, 5-liter, 4wd, new tires & radio, CB, runs well. Bob, Ext. 2710 or 467-4222.

83 CHEVY CAPRICE WAGON - 5-liter eng., p/s, ac, 135k mi., orig. owner, asking $500. Ray, Ext, 5272.

82 CHEVY MONTE CARLO - blue, alum. wheels, V-8, $750. 289-3586.

81 FORD FAIRMONT - new brakes, rebuilt tranny, stereo, ac, 6-cyl., runs well, must sell, $400. Giuseppe, Ext. 5336.

80 CHEVY MONTE CARLO - 2-dr., V-6, 82k mi., ac, p/s, p/b, dependable, ask. $1,150. Billy, Ext. 5046.

79 CHEVY EL CAMINO - white, new Edelbrock carb., $18,000. Jon, 281-7935 eves.

76 VOLVO 242 DL - s/t, good running cond., $900; '77 244 DL parts car, not running, good body, $300. Steve, Ext. 3018 or 369-5181.

75 ARGOSY TRAILER - 24', sleeps 6, must see, $2,500 neg. Mike, Ext. 4100.

74 CHEVY PICKUP - 4wd, a/t, 250, 40k mi., running bds., new springs, cap, good cond., $3,000. Roger, Ext. 2382 or 734-5114.

71 CHEVY NOVA - 305 V-8, red w/black vinyl roof, new brakes & tranny, many extra parts, $1,500 neg. Jason, 744-1194.

69 GMC PICKUP - 4wd, 50 eng., new parts, plow, extra hood fenders, $1,800; rims, 4, brand-new, Chevy, 15", w/centers, ask. $60/all. Chuck, 821-1525.

64 CHEVY EL CAMINO - new 350, 4-spd., new tires & brakes, good cond., $3,000 neg. Ext. 3428 or 878-6007.

CORSAIR CAMPING TRAILER - 18', sleeps 6-8, stove w/oven, 30-gal. water tank w/elec. pump, h/c water, more, ask. $1,000. Jim, Ext. 7912 or 286-4823.

TIRES - 2, Goodyear, P225/75R14, brand-new, orig. $175, now $40 ea.; 2, UniRoyal, white lettered, P235/75R15, $30 ea. or 2/$50. 698-9274.

BUMPERS - new, front & rear, '95 Chevy van, $100 ea. firm; new radio, am/fm cass., w/speakers, $40. Don, Ext. 7237 or 744-2921 after 5:30 p.m.

WORKSHOP MANUAL - 1990 Mazda 626 and MX-6, orig. $50, now $10. Ext. 5054.

Boats & Marine Supplies

29' THOMPSON DAYTONA - 1987, sleeps 6, radar, Loran, fully loaded, excel. cond., $25,000. Ext. 3428 or 878-6007.

27' THOMPSON - twin Mercruisers, FWC, full canvas, TV antenna, low hrs., $2,500. 736-2596.

23' CHAPPARAL - 1984, UHF/radar, o/riggers, DF, live well, full canvas, d/btys, bunks, excel. cond., $10,000. Marilyn, Ext. 2259.

23' SAILBOAT - fg, fixed keel, sleeps 4, mooring dinghy, jackstands, 6-h.p. motor, sails, new windows, excel. cond, $1,900. Mike, Ext. 7861 or 698-3967.

21' RENKEN - 1980, cuddy cabin, 140-h.p. Volvo Penta, FWC, excel. running cond., trailer, new p/winch. Patrick, 471-7853.

17' O'DAY SAILBOAT - 17' trailer, outboard, good cond., $2,200. Ed, 581-1509.

17' COBIA - deep V Bowrider, 70-h.p. Johnson, galv., trailer, v.g. cond., $1,700. Bob, 265-0391.

14' GRUMMAN SPORTS - 1989, 25-h.p. Evinrude workhorse, steering, 8 controls, Cox trailer, $2,600. Roger, Ext. 2382 or 734-5114.

STAR SAILBOAT #6210 - fg, double hull, alum spars, 2 sails, cover, trailer, meas. cert., good cond., $1,900; 1992, 3-h.p. Yamaha o.b., long-shaft, excel cond. 472-1735.

OUTBOARD - 1990, 25-h.p. Mariner, long-shaft, asking $800 or will trade for short shaft engine, excel. cond. Chuck, 821-1525.

BOAT TRAILER - galv., Shoreline EZ load, new axle & light, for 19'-21' boat, excel. cond, ask. $665. Carl, Ext. 4420.

Furnishings & Appliances

BED FRAME - queen-size, black laq., w/ground effect lights, some scratches, $65. Billy, Ext. 5046.

BISTRO SET - w/2 chairs, glass top, black wrought iron frame, gray linen seats, excel., must see, orig. $600, sell for $275. 584-3830.

CHAIRS - Ethan Allen, solid cherry, Windsor-style, 4 side, orig. $99/ea., now $125/ea., 2 arm, orig. $249/ea., now $175/ea. Eric, Ext. 5875.

CHINA - Corningware, service for 12, 103 pieces, $95. Carol, Ext. 2673.

COFFEE TABLE - $20; 1950's wood patio recliner, $55; elec. heater, $20. Kathy, 744-2203.

COUCH - love seat, matching chair, early American, good cond., $200. Warren, Ext. 2080.

COUCH - tan floral pattern, good cond., $200 neg. Tom, Ext. 5899.

CRIB - oak, like new, beautiful, orig. $200, now $60. Greg, Ext. 2575.

CROCKPOT - Rival, 5-qt., brand-new, $25; carpet sweeper, $3. Joe, Ext. 2898.

CURIO - fruitwood finish, 2-dr., 3-sided, glass front, 4 glass shelves, int. light, 48"Wx75"Hx12"D, 2-yr., old, orig. $999, now $500. Eleanor, 744-0564.

DINING ROOM SET - Mediterranean style, 6 padded chairs, lg. table, china closet, w/glass doors, new cond., $400. 744-9429.

DINING ROOM - pine, hutch, table, 6 chairs, as is, $600 neg. Barbara, Ext. 3381.

DINING ROOM - black/gray lacquer, modern pedestal table, 4 high-back chairs, hutch, $1,150 neg. Barbara, Ext. 4037 or 244-9057.

DINING ROOM - walnut table, 3 leaves, $200; 6 chairs, $40/ea.; buffet, 6x18", $200; hutch, $100; desk, $100; bench, $50. Jack, 744-3919.

DRAWING TABLE - Anco, 31"x42", new, $100; area rug, 8'x10', used 2 mos., dk. blue, $70; fish tank stand, 13"x30½"x30"H, $25. Sue, Ext. 3492.

DRYER - GE, heavy-duty, commercial, 2 cycles, $65; Gibson freezer, upright, $85. 473-6432.

ENTERTAINMENT CENTER - black, like new, $300; brass head & footboard, great cond., orig. $2,500, best offer. 821-4983.

FREEZER - upright, locking door, like new, $125. 286-3377 after 8 p.m.

MATTRESS - full-size, Posture Perfect, blue mattress/boxspring, 1 yr. old, firm. $100. Billy, Ext. 5046.

MATTRESS - boxspring, frame, queen, $230; 2 sofas, $70 & $90; storm door, $60. Ext. 3842 or 929-6925 after 1 p.m.

MICROWAVE - 12 yrs. old, $20. Rich, Ext. 7013.

REFRIGERATOR - 16 cu. ft., $100. 289-0967 after 6 p.m.

SOFA BED - Sealy, full-size, 6" innerspring mattress, beige, Scotchguarded, $425. Ext. 5873 or 878-1303.

STOVE - Hotpoint, self-clean, elec., 1½ yrs. old, $250; fp screen & grate, $15. John, Ext. 4482 or 821-4280.

WATER BED - queen-size, $100. 751-4539.

Tools, House & Garden

BULBS - giant red canna, three/$1; fig trees also avail. Jim, 325-9293.

HEATING UNIT - Miller, good cond., $100 or best offer. O. Booker, Ext. 3082 or 727-5912.

LADDERS - heavy-duty, exten., $150; 6' alum. step, $40; 2' alum. step, $10; lumber, cherry, oak, redwood, walnut, mahogany. Jack, 744-3919.

PICNIC TABLE - 7', 2 benches, $75. Marie, 589-3020.

POOL ACCESSORIES - ¾-h.p. pump; Hayward sand filter, model GM; ladder; nets; make offers. A. Romano, Ext. 4024.

SOLAR WATER HEATER - 2 sq. meter collector, cir. pump, controller, direct connect, $100 neg.; 40-gal. elec. water heater, $40. Tom, Ext. 7196 or 286-2505.

STORM DOOR - 36"W, cross buck, white, w/screen, $35; water bed, super single, padded sides & head, $150; pet carrier, $40. Sue, Ext. 7235 or 395-3529.

SWIMMING POOL PANELS - solar heat-exchanger panels, 4'x9', $40/ea. or best offer. Ext. 2165.

SWIMMING POOL - ag, 16'x30', w/all accessories, ready to go, $500. Edward, Ext. 7502.

WHITE PINES - up to 4', nursery grown, $2/ft.; blue arboritae, up to 3', $2/ft. 744-5867.

Sports, Hobbies & Pets

AMP - Peavey Bandit guitar amp, 50W, channel switching, 12" speaker, $150. Greg, Ext. 2575.

BICYCLES - girl's, 20", Rallye Northstar, $40; girl's 24" Royce Union Savoy, 15-spd., $50; both like new. Phil, Ext. 5669.

BIKE - 10-spd., men's, Huffy, $30; sports cards. 472-3254.

BIRDS - cockatiels, males/female, 1 yr. old, greys, home raised, $75. 473-6432.

EASTER BUNNIES - baby lops, dwarfs, etc. Karen, 924-0085.

GUITAR - electric bass, Aria Pro II, 4 string, Sunburst w/maple fretboard, no case, $150. Tom, 732-2427.

JIGSAW PUZZLE CADDY - 30", new, $10. Ted, Ext. 2101.

PUPPIES - Labrador Retrievers, AKC, OFA, black, field champion blood lines, v.g. temperament. Al, 878-2577 or beeper 373-9066.

TREADMILL - Jane Fonda, new, $150. Jane, Ext. 4037, or Jack, 874-4049.

WORKOUT BENCH - Weider, legs, arms, stomach, excel. cond., $55; rowing machine, $15. 472-3254.

Audio, Video & Computer

COMPUTER - 486 DX2-80MHz. CD ROM, 170 MB HD, 4 MB mem., software, mon., $875. Paul, Ext. 7697.

COMPUTER - laptop, 14 lbs., 5 MB RAM, 40 MB HD, DOS 6.2, doubler, Windows 3.1, disks, zoom 14.4 kB modem, carrying case, $500. Ted, Ext. 2101.

SOFTWARE - Microsoft Works 3.0, brand-new, shrink wrapped, w/lic., orig. $100, now $65. Paul, Ext. 4156.

PRINTER - laser, Hewlett Packard II+, w/new toner cartridge, $295; postscript cartridge, $50. Mike B., Ext. 5046 or 878-3480.

PRINTER - Texas Instruments Omni 800, model 855, $50. Bill, 878-4356.

PRINTER - Macintosh Imagewriter II, for sys. 6.0 or later, cable, manuals, ribbons, $200. Margaret, 727-3863.

RADIO ALARM CLOCK - $5; elec. vacuum, $10. Ext. 5704 or 399-7309.

SPEAKERS - Pinnacle PN-8+, excel. sound, orig. $300, sell for $150. Greg, Ext. 2575.

Miscellaneous

BABY'S ITEMS - dbl. carriage, Jolly, $40; single carriage, like new, $50; high chair, $25; Fisher Price workshop, w/access., $50. Rex, 929-3235.

CRIB - safety, solid pecan, $75; bouncer, $12; diaper pail, $5. 473-6432.

FLOORING - 18 sq. ft., rock maple for countertop; 2 b&w TVs; approx. 20 pieces polished marble, about 4 sq. ft. ea. Paul, Ext. 7697.

GOWNS - spring/summer, for proms, weddings, parties; coat, beige. Ext. 5938.

HUMMEL PLATES - assorted, anniversary editions, collectors' items, in orig. boxes. Jeanne, Ext. 7722.

PROM DRESSES - red satin, new; cotton floral off shoulder, new; Gunne Sax peach satin strapless, excel., sizes 11-13, $35/ea. 473-6546.

TICKETS - 2, Jimmy Page & Robert Plant, Meadowlands, 4/6. 821-4983.

Free

ELECTRIC RANGE - old tan/yellow range, still works. Robin, Ext. 4967.

FIREWOOD - many hardwood trees, stacked up, some pine, lots of kindling, bring saw, backhoe avail. to help you load. Frank, 234-0538.

MAGAZINES - *Rolling Stone,* 1980s, dozens of issues, you pick up. Karl, Ext. 3116.

Car Pools

CUTCHOGUE/MATTITUCK - need 1 or 2 for 8-4:30 existing carpool. Richie, Ext. 2175 or Roger, Ext. 2382.

LIE EXIT 36 - fourth needed. John, Ext. 5181.

Yard & Garage Sales

BELLPORT - 4/1-2, 10 a.m.-4 p.m., large $1 section, 19 Fuoco Lane.

BROOKHAVEN - 4/1, tools, furn., lawn mower, woodstove, books, etc., 254 S. Country Rd., 1 mi. east of Bellport.

SHOREHAM - 4/1-2, 9 a.m.-5 p.m., everything must go, furn., dishes, tools, toys, paintings, records, knicknacks, linens, clothes, 6 Norman Dr.

Wanted

BABY'S FURNITURE - dresser & armoire, no crib needed. 286-4969.

CAMPING TRAILER - 24-28', good cond., entry-level; power washer, gas or elec., reasonable. Bill, 281-6498.

CARS AND PARTS - VW Beetle, will buy, need rear seats. Rich, 929-8514.

CRADLE - wooden, for newborn, buy or borrow. 474-8715.

DONATIONS FOR UPTON NURSERY SCHOOL - tag sale on 5/6. Cindy, 874-3652 or Jane, 929-8513.

DRAWING TABLE - Anco-type, adjustable, 23"x31" all wood. John, Ext. 7671.

HOMES FOR VISITORS - furn. apt., condos, homes, short-term rentals for visitors/guests of BNL. Marie, Ext. 4489.

MOVIE-TO-VIDEO - transfer machine. Morris, Ext. 4192.

In Appreciation

I thank all my friends and coworkers who offered their sympathy and support following the loss of my wife.
— Wayne Rasmussen

Farewell Gathering

RETIREMENT PARTY - for Eric Forsyth, 4/27, at the Brookhaven Center, 5:15 -8 p.m., open invitation, call for details. Mary, Ext. 2719.

Classified Ad deadline is 4:30 p.m. Friday for publication Friday of the next week.