BROOKHAVEN BULLETIN
Vol. 46 - No. 23 June 5, 1992
BROOKHAVEN NATIONAL LABORATORY

GALLEX Experiment Observes Neutrinos From the Sun

First results from the GALLEX experiment in Italy indicate that the primary neutrinos in the sun are produced at a rate consistent with current solar models. This conclusion is contrary to that drawn in a similar experiment that has studied the sun's production of these elusive particles.

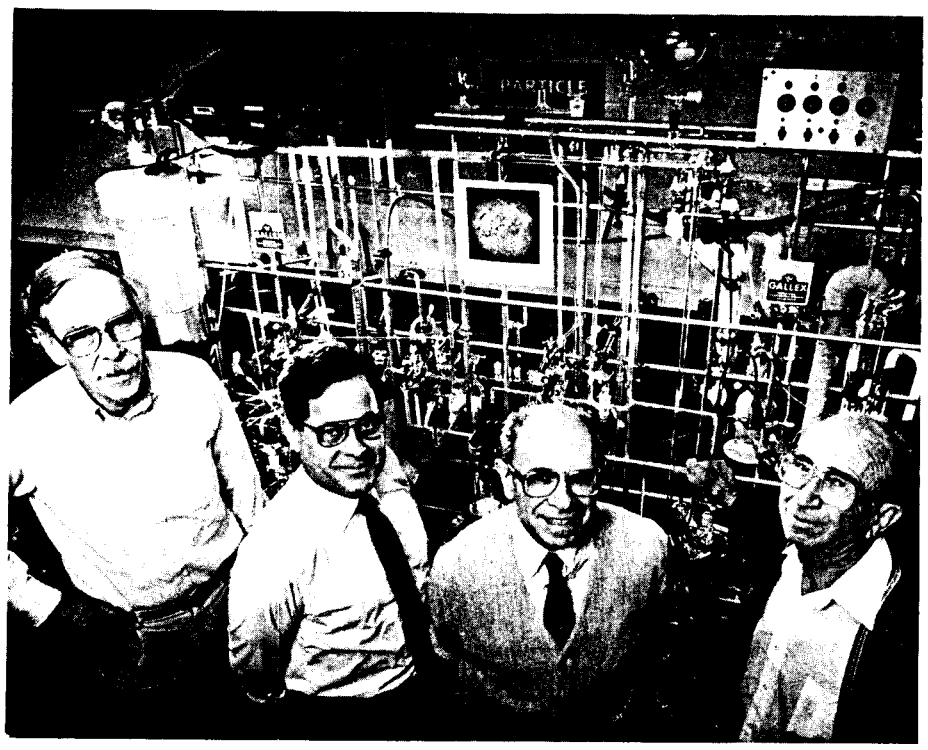
BNL is the sole U.S. laboratory participating in the GALLEX collaboration, which also involves chemists, physicists and engineers from nine other institutions around the world.

These early GALLEX results, according to Richard Hahn of BNL's Chemistry Department, "provide the first observation of the low-energy neutrinos that are produced deep in the sun's core in the primary step of the hydrogen fusion cycle that energizes the sun."

The GALLEX results also are relevant to the validation of two important scientific theories — one, in astrophysics, that describes energy production in the sun and other stars; and another, in particle physics, that discusses possible new properties of the neutrino.

The work is described in two separate papers submitted this week for publication in *Physics Letters B*, a European journal. One paper reports the data, while the second addresses their implications.

In addition to Hahn, the U.S. team includes Francis Hartmann, Keith Rowley and Raymond Stoenner, who are all in BNL's Chemistry Department; and Joseph Weneser, Physics Department. Another 49 scientists come from Germany, Italy, France and Israel.



Four of the Americans on the GALLEX team are: (from left) Keith Rowley, Richard Hahn, Joseph Weneser and Raymond Stoenner. Not pictured is the fifth BNL researcher, Frank Hartmann, who was in the Gran Sasso Laboratory at the time of the photo. A copy of the apparatus shown was shipped to Gran Sasso from BNL and is used in GALLEX.
— Photo by Roger Stoutenburgh

A Gallium Neutrino Trap

In standard theory, the sun's energy is produced from the conversion of hydrogen into helium. For every two hydrogen atoms converted, one neutrino is produced.

Neutrinos are electrically neutral and have a small or zero mass. They interact with matter so weakly that they usually pass right through the earth.

The GALLEX experiment was conceived in the 1970s at Brookhaven Lab, which has a long history of studying solar neutrinos. GALLEX stands for Gallium Experiment, so named because 30 tons of the element gallium are used in the experiment.

The gallium, in the form of gallium chloride, is dissolved in a solution of water and hydrochloric acid contained in a 50,000-liter tank. The tank is located in the Gran Sasso underground physics laboratory deep in a tunnel under the Abruzzi mountains of Italy, well shielded from cosmic ray interference.

When a solar neutrino enters the tank, it can transform the isotope gallium-71 into radioactive germanium-71, which has a half-life of 11 days.

Every 21 days, a series of intricate chemical manipulations are carried out to remove and purify the germanium, which is then placed in a small, 1-milliliter volume counter that measures radioactive decay. These measurements yield the number of reactions caused by neutrinos that occurred in the tank during each three-week cycle.

The first cycle was begun in May 1991. Fifteen cycles have been run, 14 successfully, with the last run completed at the end of this April.

GALLEX vs. Previous Experiments

Scientists around the world have awaited results from GALLEX because earlier experiments have detected neutrinos in smaller quantities than expected by theory.

Three major experiments have been carried out in the past. The first one dates back to 1967, when Raymond Davis, a retired BNL scientist who is now a research collaborator, and his colleagues set their solar neutrino trap in a deep gold mine in South Dakota. Instead of gallium, the active ingredient in their experiment was chlorine (the isotope chlorine-37) contained in ordinary dry-cleaning fluid. Neutrinos can transform chlorine-37 into a radioactive isotope, argon-37.

The results from South Dakota were intriguing. Scarcely one-third of the expected number of neutrinos were detected. So it was inferred that the standard solar model should be reexamined or that neutrinos have characteristics not yet understood.

To complement the South Dakota experiment, GALLEX was designed to

(continued on page 2)

GALLEX Seminar

A special seminar on the first results from GALLEX will be given by BNL Chemist Richard Hahn on Tuesday, June 9. He will speak at 11 a.m. in the Hamilton Seminar Room, Chemistry Department, Building 555.

Long Island Research Institute: Joining Forces To Transfer Promising Technologies

BNL is one of three major Long Island research institutions that form the nucleus of the Long Island Research Institute (LIRI) — a newly created nonprofit corporation for promoting technology transfer.

Concluding a year of discussion, Associated Universities, Inc. (AUI), which manages BNL for the U.S. Department of Energy, has joined with Cold Spring Harbor Laboratory and the State University of New York at Stony Brook to create LIRI, which will focus on bringing new technologies from the academic sphere to the world of commerce.

AUI President Robert E. Hughes and BNL Director Nicholas Samios are two of the 11 directors of LIRI, which was officially constituted on Thursday, May 21, when the board met for the first time to approve LIRI's certificate of incorporation and bylaws, and to elect corporate officers.

At its first meeting, the newly formed LIRI Board elected Walter B. Kissinger as its Chairman. The retired Chairman of The Allen Group, he currently heads WBK Associates and the Kissinger Family Foundation. He is listed in *Who's Who*.

Chosen as President and Chief Executive Officer was Philip Palmedo, who was a scientist in BNL's Department of Applied Science until 1979, when he left to found the International Resources Group, a consulting firm in energy, natural resources and finance.

Walter B. Kissinger

Samios called Kissinger and fellow LIRI Director James Simons, President of Renaissance Technologies Corporation, "the prime movers who gave this idea the early push."

For his part, Kissinger said, "The thing that struck me when I first became involved was that the situation on Long Island was a kind of paradox, with an economy based on defense that is declining and an abundance of research capability. We felt that there is great opportunity for some of this research capability to flow into industry."

Thus, LIRI's objectives are three: to accelerate the flow of research from Long Island research institutions into commercial application, to act as a catalyst for collaborative sponsored research between Long Island research institutions and industry, and to contribute to the solution of economic and environmental problems of the Long Island region.

"Of the three institutions that are participating," Kissinger continued, "Brookhaven is by far the largest and most diverse. Predictably, Brookhaven will make very major contributions."

At BNL, the Office of Technology Transfer works with researchers to find commercial markets for their ideas, when appropriate. With the advent of LIRI, Samios said, "Nothing changes. This just confers another avenue — a strong one."

LIRI will augment the technology-transfer operations of BNL and the other founding institutions with an active program of technology evaluation. It will facilitate the application of technologies through licensing agreements, joint ventures and company start-ups, as appropriate.

Initial opportunities have been identified in the areas of biotechnology, medical equipment and instrumentation, energy technologies, environmental analysis and technologies, advanced materials, and information technology and software.

The staff that such programs require would be too much for any single institution to support. But among them, LIRI's three founding institutions have over 1,500 Ph.D. or M.D. researchers conducting more than $400 million in sponsored research annually. These collective numbers virtually guarantee demand for LIRI's services.

For example, in the course of doing basic research, a BNL scientist might see a potential application for a discovery, but also recognize that it needs more development to be mar-

(continued on page 3)

Coming Up

Joseph Indusi, Associate Chairman of DNE who also heads its Technical Support Organization, will deliver the next Brookhaven Lecture. He will discuss "Technologies for Arms Control Verification" beginning at 4 p.m. on Wednesday, June 17, in Berkner Hall.

Safeguards for a Changing World

With the fall of the Iron Curtain and the rise of third-world dictators like Sadam Hussein, the International Atomic Energy Agency (IAEA) is changing the way it inspects nuclear material under the Non-Proliferation Treaty (NPT).

In the past, the IAEA assumed that countries that are party to the treaty would comply in good faith with their obligations to declare and control nuclear material, and to permit inspection of all nuclear facilities. As Iraq proved to the IAEA with its clandestine nuclear weapons facilities, however, not all treaty signatories are holding to this agreement.

As a result of the changing nuclear world, the IAEA is shifting its approach to the NPT. In addition to continuing its traditional inspections of declared facilities, the IAEA is developing new safeguards approaches to monitor all nuclear materials, equipment and facilities, not all of which are necessarily declared by party nations.

To discuss in general how the IAEA may pursue both its traditional and new approaches to safeguards and inspections without expanding its budget, the Semiannual Review of Technical Support for IAEA Safeguards was held on site, April 29-May 1. At the meeting, it was agreed that one important new departure in upholding the NPT is an expanded base of information on countries' import, export and holdings of nuclear and nonnuclear material, equipment and facilities.

Brookhaven is involved with the IAEA through the International Safeguards Project Office (ISPO), a group within the International Projects Division (IPD) of BNL's Department of Nuclear Energy (DNE). ISPO was established in 1977 to manage a special Program of Technical Assistance to IAEA Safeguards (POTAS), under the supervision of a committee including the Arms Control & Disarmament Agency, the U.S. Departments of Energy and State, and the Nuclear Regulatory Commission. Through a 1976 act of Congress, POTAS was set up as the first and largest of 14 programs operated independently by IAEA member nations to provide the IAEA with additional funds, expertise and equipment with which to carry out inspections.

The meeting was attended by, among others: (from left) ISPO and IPD Head Ann Reisman; DNE Chairman Romney Duffey; J. Christian Kessler, U.S. Department of State; Jon Jennekens, Deputy Director General IAEA Department of Safeguards; and Kaoru Naito, Director of the Division of Development & Technology Support within the IAEA Department of Safeguards.

Representatives from five national labs that receive R&D money from POTAS were also in attendance. They included a member of the staff of BNL's Technical Support Organization, another DNE division.

Leaving the Lab — After 35 Years or More

Robert Jones, a senior technical associate in the Department of Applied Science (DAS), may have retired from working at BNL with 40 years of service as of Sunday, May 31, but he hasn't retired from playing at BNL — as a member of the Brookhaven Employees Recreation Association (BERA).

"BERA is an important part of the Lab, but lots of people who work here don't take advantage of the sports and social opportunities it provides," comments Bob Jones, who pitched every season with the Softball League from 1952 to 1989, who continues occasionally to knock the pins down after 35 years in the Bowling League, and who intends to making hitting the little white ball in the Golf Association his "main frustration in retirement." His BERA career also included chairing the Softball and Bowling Leagues for a combined total of eight years.

Jones began his association with BNL and BERA on November 11, 1951, when he was hired as a patrolman. In January 1956, Jones transferred to work at the Brookhaven Graphite Research Reactor (BGRR), as a technician with the Radiation Effects Group of the Nuclear Engineering Department (NED).

Working on the development of a liquid-metal fuel reactor, Jones assisted in evaluating the metallurgical properties of different materials being considered for use within that type of reactor. He also characterized graphite samples taken from the BGRR — and is immortalized as one of two lifesize cardboard cutouts of radiation workers dressed in self-contained air suits that now stand in the Science Museum/Exhibit Center occupying the BGRR building.

To do this work, during the late 50s, Jones helped to build the metallurgical hot cell within the Hot Lab, Bldg. 801, and used the manipulators to handle irradiated materials under test within that cell. In addition, he was called upon to test samples of control rods and fuel elements taken from the HFBR.

"Handling very high radiation sources got to be pretty routine after a while," he recalls. In 1959, he was promoted to senior technican, to technical specialist III in 1961, and to technical specialist II in 1966.

When rocks collected from the moon's surface by Apollo 11 astronauts were sent to the Lab in October 1969, Jones helped analyze them for radioactivity, as part of the effort to date the rocks and compile a lunar history. As he recalls, "The sample I worked with was small, not much to talk about. But I was reminded that, if I lost that sample, I couldn't go get another too easily."

After 1969, when the NED became the first DAS, Jones moved into the old Metallurgy building, Bldg. 480, to join what has since become the Materials Science Division within the present DAS. In 1970, he was named a technical associate II, moved up to technical associate I in 1980, and given his present title in 1986.

Bob Jones

Since the discovery of new high-temperature superconductors in 1986, Jones has worked on their development and on the preparation of superconducting samples to be examined with the electron microscope.

Now at home in Wading River, not far from where he grew up on the grounds of Wildwood State Park as a son of the superindendent, Jones has no plans to move. "People ask why I don't move out east to some nice little village, and I try to tell them that I did, but everyone else also moved to Wading River.

"I have the usual list of projects that I'd like to get done around the house. The only experimenting that I expect to do is attempting to make the perfect margarita. My wife is still working so she can support me in the style that I'd like to get accustomed to," says Jones of his wife Sharon Jones, who works in the Safeguards & Security Division.

So, during Sharon Jones' off hours and vacations, they will play golf and travel, first to Montauk to visit Jones' daughter and her family, then to Colorado to see his son and daughter-in-law. — Marsha Belford

Apprentices Graduate

At a graduation ceremony on June 1, five new, fully qualified journeymen joined the ranks of BNL's cabinetmaker, machinist, plumber and steamfitter trades. Holding their certificates, (front, from left) plumber Kevin Kobus, steamfitter Kevin Tisch, machinist Frank Teich, (middle, left) steamfitter Thomas Walters and (middle, right) cabinetmaker Richard Okula celebrate their successful completion of the Lab's four-year Craft Apprentice Program. Jointly run by the International Brotherhood of Electrical Workers and BNL, this program provides training opportunities to Lab employees in apprenticeable trades.

Also present to wish the new journeymen well are: (back) Mary White, Supervisor of the Apprenticeship Program, and Joint Apprenticeship Committee members (center) Stephen Gracia and (back, from left) Wally Spiers, Bill Chaloupka, Mike Cardarelli and Ed Jackie. Not present are Charles Geonie and Lou Graziano. — **Photos by Roger Stoutenburgh**

GALLEX (cont'd)

use gallium, which is sensitive to a broad spectrum of solar neutrinos, including those that have energies below the threshold for interaction with chlorine in the South Dakota system.

Another gallium experiment, dubbed SAGE, was mounted in Russia by a team of Russian and American scientists. SAGE is in some ways similar in concept to GALLEX. For example, it, too, uses gallium.

First results from that experiment were announced in the summer of 1990 and then published in December 1991. SAGE had found essentially no evidence of neutrinos. Hence, the GALLEX results are incompatible with the published SAGE values.

In 1990, the Japanese also reported a neutrino deficit in an experiment that used a different technique — scattering of neutrinos from the electrons contained in a huge volume of water. They saw about half of the predicted flux of neutrinos.

Of the four solar neutrino experiments, only the ones with gallium are sensitive to the low-energy neutrinos that are the major product of nuclear fusion in the sun.

Given its present accuracy, says Hahn, the GALLEX result, taken by itself, is consistent with the current theory of the production of these low-energy neutrinos in the sun.

"This solar model, however, is severely strained, but not completely ruled out, when it tries to accommodate not only GALLEX, but also the results of the two other experiments — the chlorine and the Japanese — that have looked at high-energy neutrinos from the sun," he says.

He notes that a different, intriguing theory invokes the possibility of neutrinos having significant mass, in order to reconcile these three solar neutrino experiments.

Says Hahn, "The results from GALLEX have severely limited the possible options that are available to these two different theories. But GALLEX cannot yet put beyond all doubt the choice of one theory over the other."

The GALLEX team plans to extend the experiment for several more years, in order to refine their experimental results. BNL's participation is supported by the U.S. Department of Energy's (DOE) Office of Nuclear Physics, within DOE's Office of Energy Research (OER).

William Happer, OER Director, offered his congratulations to the researchers and BNL. "These are spectacular research results," Happer said. "They appear to be consistent with the major reaction that scientists theorize produces the sun's energy. The research itself is a unique combination of exquisite nuclear physics and chemistry that exemplifies the interdisciplinary strengths of Department of Energy national laboratories."

— Mona Rowe

LIRI (cont'd)

ketable. BNL research funds could not be used in that applied effort, but LIRI could provide financing.

Because LIRI will also provide marketing and evaluation expertise, "The concept will help the researcher who wants to see his or her idea commercialized, but who doesn't want to leave the Lab," said Samios, "and that's the part that attracts me because we don't want to lose our scientists!"

LIRI was launched with about $100,000 in start-up money from the founding institutions. With support from the New York State Science and Technology Foundation, $400,000 for LIRI has been written into the state budget and should be forthcoming in the next months. Thereafter, funding is expected to come largely from state and federal sources and research contracts.

In creating the distinct entity that is LIRI, the founding directors looked to other existing institutions for direction. In particular, Kissinger cited the Stanford Research Institute, "which was started during World War II and had an influence on the explosive growth of Silicon Valley."

Samios sees the same kind of possibility here. "LIRI should be very fruitful," he said, "creating all sorts of enterprises, and benefiting Long Island and the three institutions in particular." — Anita Cohen

Tennis Fun Day

The Tennis Committee has scheduled a Tennis Fun Day at the Lab's courts on Saturday, June 13, at 9 a.m., with a rain date of June 20. To sign up, call Om Singh, Ext. 5332.

This free event is open to all Lab visitors, employees and family members. So bring your racket and a can of balls to join us for Fun Day.

Cafeteria Menu

Luncheons

Monday, June 8	
Soup: Chicken rice	.80/1.10
Entree: Spaghetti w/meatballs	3.20
Entree: Chef's choice	3.20
Fitness: Vegetable quiche	3.20
Carvery: Hot pastrami sandwich	2.95
Grill: Reuben w/French fries	2.95
Tuesday, June 9	
Soup: Corn & potato chowder	.80/1.10
Entree: Chicken Provencale	3.35
Entree: Chef's choice	3.20
Fitness: Baked fish w/mushrooms & wine sauce	3.45
Carvery: Hot roast beef sandwich	2.95
Grill: Pastrami & cheese combo w/FF	2.95
Wednesday, June 10	
Soup: Split pea	.80/1.10
Entree: Tricolor tortellini w/red sauce	3.20
Entree: Chef's choice	3.20
Fitness: Beef stroganoff over noodles	3.35
Carvery: Hot baked ham sandwich	2.95
Grill: Turkey, tomato, bacon & Swiss	2.95
Thursday, June 11	
Soup: Cream of mushroom	.80/1.10
Entree: Chicken Kiev w/veg.	3.45
Entree: Steamed fresh vegetable platter	2.35
Fitness: Chef's choice	3.20
Carvery: Hot corned beef sandwich	2.95
Grill: Double burger w/fries	2.95
Special: Soup & sandwich	
Friday, June 12	
Soup: New England clam chowder	.80/1.10
Entree: Baked fillet w/herbs	3.45
Entree: Macaroni & cheese	3.20
Fitness: Chef's choice	3.20
Carvery: Hot roast turkey sandwich	2.95
Grill: Tuna melt w/fries	2.95

MOVIE.....*Major League*
Wed., June 10.....8 p.m.....Center Club

BROOKHAVEN BULLETIN

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

ANITA COHEN, Editor
MARSHA BELFORD, Assistant Editor
LIZ SEUBERT, Reporter

35 Brookhaven Ave., Upton, N.Y. 11973
(516) 282-2345

An Evening of Indian Music

Ajoy Chakrabarty and Tapan Baidya, two of the foremost vocalists of India and Bangladesh, will appear in Berkner Hall in a special program sponsored by the BERA Concert Committee, on Friday, June 12, at 8 p.m.

Now one of India's leading artists, Ajoy Chakrabarty has been performing since the age of six. Although an exponent of the *Patiala-Kasoor* style of North-Indian vocal classical music and a spiritual successor to the late Maestro Bade Ghulam Ali Khan, he is an excellent performer of light-classical vocal music as well.

Ajoy Chakrabarty

As the *New York Times* has noted,"Mr. Chakrabarty's most impressive quality was the often astonishing array of attacks and colors he could summon up with his voice — making it whisper, wail, stutter, vibrate, trill, execute a kind of high-level scat-singing, rapidly shift pace and 'bend' a beat or tone in just the right way to keep alive the musical line."

Tapan Baidya is among the most promising young vocalists of Bangladesh. Trained in the traditions of Indian vocal classical music — *Dhrupad, Dhamar, Khayal* and *Thumree* — he has attracted much critical praise and attention.

Tickets for the concert will be sold at the door for $15, and $10 for students. For more information, call Hasna Khan, Ext.7028 or 821-5043; Mahbub Khandaker, Ext. 7249; or Waled Chowdhury, 937-6131.

A Convincing Approach to Safety

Need a good reason to wear your seat belt? Take a ride on the "Convincer" next Friday, June 12, in the parking lot on the east side of Bldg. 134. All are invited to participate in this convincing demonstration by the Suffolk County Police Department — the culmination of the Plant Engineering (PE) Division's observance of National Safety Week, June 7-13, which is sponsored by the American Society of Safety Engineers to emphasize safety professionals' critical role in preventing accidents and saving lives.

PE's Safety, Quality Assurance & Training Group has scheduled several other events for PE staff during a Safety and Health Exhibition covering three topics: Preventive medical care on Monday, June 8, will include a blood pressure clinic with representatives from BNL's Occupational Medicine Clinic. Nutrition and fitness, on Wednesday, June 10, will feature BNL's Walking and Swim Clubs. Vehicle safety on June 12 will include defensive driving — and the Convincer.

Arrivals & Departures

Arrivals

Charles Ashby.....Medical
Dinko Franceschi.....Medical
Chong-Jer Liaw.....Accel. Dev.
Weifang Luo.....App. Science
Yaw-wen Yang.....Chemistry

Departures

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

Margaret E. Appleby.....Con. & Proc.
Robert H. Jones.....App. Science
David C. Lyon.....Cen. Shops
Elizabeth L. Roche.....Medical

Gym Closing

Effective immediately, the gymnasium will be closed on Saturdays and Sundays throughout the summer.

PSI Celebrates 10th Anniversary

The first ten years of the Upton Chapter of Professional Secretaries International (PSI) will be celebrated on Wednesday, June 10, at 6 p.m., in the Recreation Building.

Following a festive cold buffet and dessert, guest speaker Mary Eisenstein of Chrysalis Enterprises will discuss "Your Business Image," giving historical and cultural perspectives on the views people have of themselves in their careers.

To attend the dinner, send a check for $8 per person, payable to Upton Chapter, PSI, to Susan Carlsen, Bldg. 701. For more information, call Carlsen, Ext. 7647, or Sharon Jones, Ext. 2493.

Swim Club Splish Splash

Celebrate the 4th of July one day early with the BNL Swim Club — at Splish Splash.

On Friday, July 3 — a Lab holiday — the BNL Swim Club is sponsoring a group trip with discounted tickets to Splish Splash. Located in Riverhead off LIE Exit 72, Splish Splash is Long Island's newest and hottest water park.

Opened last year, this year it features three new water rides, plus unlimited schusses down the Kamikaze, Double Hump, and other fast and fun flumes. The Lazy River ride is for the more sedate, and a children's area offers three different kiddie pools. Splish Splash also has acres of beach chairs, sun and shade; high-diving and tropical bird shows; concession stands; and more.

On July 3, the Swim Club will meet in the Splish Splash parking lot at 9 a.m. to distribute tickets. The park opens at 9:30 a.m. and closes at 6 p.m.

The Swim Club has reserved 50 admission tickets at $10 each — $6.95 off the usual cost for adults and $2.95 off an under-48-inch-tall child's ticket. Children under two are admitted free. Parking is an additional $3 per car, to be paid to the lot attendant.

Paid reservations are being taken first come, first served by Marsha Belford, Bldg. 134, Ext. 5053. In case of rain on July 3, the trip will be canceled and money refunded.

Equipment Demo And Evaluation

All are invited to help the Technical Information Division (TID) evaluate two CD-ROM-based systems at a demonstration in Berkner Hall on Tuesday, June 9, from 11 a.m. to 2 p.m.

One system, from Cahners CAPS, offers technical documentation of semiconductor and integrated-circuit manufacturers. The other, from National Standards Association, provides full-text industry vendor catalogs.

TID's Pat Flood will be on hand to answer questions and take comments.

Cooking Exchange: Potluck Dinner

To end a tasteful season, the Cooking Exchange will hold a potluck dinner on Friday, June 12, starting at 5:30 p.m. in the Recreation Building. All families are invited, especially newcomers to BNL or the apartment area. Please bring a dish that will feed two families of your size so that we will be able to share. Drinks will be provided.

Sign up before June 7 by calling Li-Jiuan Huang, Ext. 3096, or Yfke Boosman, 736-2880.

Basketball Champions

The Trailblazers blazed through their schedule, winning 11 of their 12 games to become the regular-season champs: (from left) co-captain Ralph Garappolo, Terry Buck, co-captain Troy Mayo, Steve Springston and Alex Ratti. Not pictured: Dwayne Branch, Rich Domenech, Charles Edwards, Allen Jones and Dan Martin. — Photos by Roger Stoutenburgh

The Runaways ran away with the championship game, beating the Trailblazers 74-65 to take top honors in the end-of-the-season tournament: (from left) captain Gerry Shepherd, John Belz, Jim Desmond, Lars Furenlid, Steve McAlary, Mike Fulkerson, Pete Ratzke and Wayne Cummings. Not pictured: Jerry Gaeta and Bob Wells.

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 ASSOCIATE - trained in experimental condensed-matter physics or materials science, with emphasis on measurements describing microscopic interactions in solids, to conduct neutron-scattering studies of solids utilizing the HFBR. Contact: Stephen Shapiro or John Tranquada, Physics Department.

POSTDOCTORAL RESEARCH ASSOCIATE - trained in experimental particle or relativistic heavy-ion physics, to participate in the design, construction, testing and implementation of large scintillating crystal-based veto system for AGS Experiment 787, a study of rare K^+ decays. Contact: Laurence Littenberg, Physics Department.

POSTDOCTORAL RESEARCH ASSOCIATE - trained in physics, specifically electron microscopy, to conduct research to produce nanochannels down to 2 nanometers and measure ion transport through channels. Contact: Myron Strongin, Physics Department.

POSTDOCTORAL RESEARCH ASSOCIATE - trained in experimental elementary particle physics, to join a team analyzing data from the current $\bar{p}p$ collider run at Fermilab using the DØ detector. Contact: Serban Protopopescu, Physics Department.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees.

DD 0852. OFFICE SERVICES POSITION (term appointment) - Requires AAS or equivalent and excellent oral and written communication skills. Will provide varied secretarial and clerical support to the Protein Data Bank and carry out editorial functions associated with accepting and processing of data submissions. Word processing experience desired. Chemistry Department.

DD 0265. SECRETARIAL POSITION - Requires AAS in secretarial science or equivalent experience, a thorough knowledge of Laboratory policies and procedures, and excellent communication skills. Responsibilities will include preparation of correspondence and travel arrangements through IPAP, and record keeping. IBM PC experience required; WordPerfect 5.1 desired. Office of Equal Opportunity.

NS 0160. CONSTRUCTION INSPECTOR (electrical) - Requires minimum of ten years' related experience in electrical and fire-detection systems. Previous experience with electrical construction trade highly desirable. Responsibilities include the inspection and coordination of all phases of construction work; must be capable of reading and interpreting construction documents, and be knowledgeable of BNL QA and safety standards, OSHA regulations and National Electric Code. Plant Engineering Division.

NS 0162. ROADS & MASONRY SUPERVISOR - Will direct employees on jobs, including assignment, training, scheduling, grievance handling and technical direction. Coordinates all work of unit; maintains records and reports; and supplies technical assistance and information as requested. Plant Engineering Division.

NS 8389. DEPUTY DEPARTMENT ADMINISTRATIVE MANAGER - Requires bachelor's degree or equivalent experience, and extensive administrative experience and supervisory background. Demonstrated experience in budget preparation, procurement and property management required; familiarity with project-management systems a plus. Duties include responsibility for many of the daily administrative functions within the Department, as well as assisting in the implementation and coordination of new administrative procedures as required. Department of Nuclear Energy.

Motor Vehicles & Supplies

89 BRONCO EDDIE BAUER - like new, perfect inside & out, every option, 39k mi. 727-3863.

85 SUBARU XT - 95k mi., light blue, sunroof, am/fm cass., 757-1973.

85 HOLIDAY ALUMILITE XL CAMPER TRAILER - 31', sleeps 6, dbl. bed, F/R entry, rear bdrm., all deluxe, all amenitites. Florence, 924-3291.

84 FIREBIRD - 2-dr., 63k mi., a/t, am/fm cass., tinted, a/t, excel. cond., $2,900 neg. Ext. 3583.

83 NISSAN SENTRA XE COUPE - 2-dr. h/b, 5-spd., ac, Michelin XA4 tires, recent timing belt, 115k mi., new brakes, more, $1,400. Ext. 2296.

83 PLYMOUTH RELIANT WAGON - white, blue int., a/t, ac, am/fm, 88k mi., good cond., asking $1,495. Bob, Ext. 4562 or 744-2913.

83 YAMAHA VIRAGO - black, garaged, extras, mint cond., $1,900 neg. Charles, Ext. 5211 or 321-6674 eves.

80 HONDA CIVIC GL - 1500cc, high mi., runs, basic transportation, $250. 363-8332.

80 BMW 320I - 5-spd., sunroof, am/fm, ac, mag wheels, high mi., reliable, $1,400. John, Ext. 7671 or 765-1299.

80 NISSAN 200SX - 2-dr., a/t, stereo cass., ac, cruise, p/s, p/b, 107k mi., good cond., $800. Joung, 689-6717.

80 HONDA MOTORCYCLE - Model CR1200T, low mi., excel. cond., helmet incl., $300. 744-6423.

78 CUTLASS - nice body, no rust, runs well, $800 neg. James, 736-1639 after 6 p.m.

78 FORD PINTO - cheap, basic transportation, no rust, $100. Danby, 929-4530.

77 FORD PINTO WAGON - a/t, 69k orig. mi., gently used, good cond., 4 new radial tires, $750. Ext. 4240 or 286-0295.

72 MERCEDES 280 SEL - 4.5, beautiful collector's sedan, p/w, ac. Bill, 924-7357.

71 HONDA MOTORCYCLE 750 - runs well, $250; helmet, $60; leather suits, medium & small, $100 ea. Siggy, Ext. 4360 or 331-5416.

TOYOTA SR5 PICKUP - long-bed, cap, hitch, runs well, body rough, $300. Bill, 286-7583.

91 ACURA INTEGRA - 3-dr., 5-spd., ac, factory alarm, am/fm cass. w/4 speakers, equalizer, p/w, p/sunroof, low mi., $13,900. Ext. 5919 or 722-3010.

91 DIRT BIKE - Suzuki RM250, $2,100; 87 trailer, hi-point fg, full encl., more, $3,500. Lois, Ext. 4904; Bob, Ext. 4672 or 929-4753 eves.

89 JEEP CHEROKEE - 4x4, 4-dr., ac, p/s, p/b, a/t, 4.0L eng., roof rack, excel. cond., $10,500. Luke, 928-9136.

87 NISSAN PICKUP - excel. cond., 38k mi., $4,000. Dan, 360-3803.

83 HONDA 1000 MOTORCYCLE - custom, excel. cond., 10-spd., h/l range, 11k mi., $2,000. Chuck, Ext. 4688 arter 6 p.m.

83 PONTIAC GRAND PRIX - runs well, body good, p/s, p/b, ac, am/fm cass., $1,000. Ed, 924-3528.

83 CHRYSLER LEBARON - 75k mi., good cond., asking $1,700. Arne, Ext. 3422.

82 PONTIAC FIREBIRD - runs well, brakes & tires good, ac, p/s, p/b, a/t, rebuilt eng. & trans., $1,000 neg. Jim C., Ext. 4150.

81 MONTE CARLO - V8, T-tops, ac, cruise, tilt, new tires, am/fm cass., spoiler, good cond., $1,600 neg. Gregg, Ext. 4446 or 874-8631 after 5 p.m.

79 BUICK CENTURY - a/t, p/s, p/b, ac, 4-dr., 94k mi., good tires, new rad., runs well, 3.8L V6 eng. Bob, Ext. 5016.

74 CHRYSLER TOWN & COUNTRY STATION WAGON - 8-cyl., ac, $350. Tony, 698-9274.

73 COUGAR - 6-cyl., 73k mi., 4-dr. 437-4978.

72 NOVA - collector's item, s/t, 6 cyl., excel. cond. 472-4518.

70 CHEVY IMPALA - 350 cu. in. V8 eng., 2-dr., a/t, ac, 120k mi., needs to be restored, w/spare trans., $300. Bob, Ext. 4002 or 924-7658.

67 PONTIAC LEMANS - big block Chevy, 450 h.p., everything new, extras. 744-3284 after 6 p.m.

WHEELS - 2, GM, 14", 5-lug, excel. cond., $15/both. Paul, 727-4859

BUMPERS - front, Oldsmobile Cutlass Supreme, 1978-79, good cond., $30; Cadillac Seville 1980-85, v.g. cond., $125. Ray, 727-3608.

HITCH RECEIVER - Class III; weight dist. frame hitch, sway control hitch assembly; stabilizer jacks, $200. John, Ext. 4028.

TIRES - 4, 13" Michelins, fairly new, ask. $185. DeVonne or Troy, 924-2075.

Boats & Marine Supplies

28' BERTRAM - 1974, FWC, Mercruisers, 600 hrs., new cushions, full canvas, mint, must see. Bill, 283-0071.

23' FOUR WINNS - 1986, 230-h.p. Merc I/O, used 2 seasons, many extras, trailer optional, $10,900. Charlie, Ext. 2407.

23' CUDDY CABIN - 260-h.p. Chrysler I/O, camper top, trailer w/elec. winch, more. $5,000. Dennis, Ext. 4028 or 298-4117.

19' FOUR WINNS - 1987 cuddy, 190-h.p. FWC Mercruiser I/O, full canvas, $7,000. Michael, Ext. 2081 or 878-9384.

18' HOBIE CAT SAILBOAT - 1990, w/trailer, hardly used, excel. cond., $4,000. 473-1456.

17' BOAT - 40-h.p. runabout, plywood, f/g, trailer, under tarp 5+ yrs., as is $300. John, 744-5867 after 5 pm.

16' BOWRIDER - f/g, 65-h.p., galv. trailer, runs well, $1,200. Jim, Ext. 3372 or 821-0250.

10' GAMEFISHER - 5½-h.p. Johnson, 12 hrs., tilt box, gas tank, complete; 7' f/g dinghy, $950/all. Chuck, Ext. 4688.

10' DINGHY - $220. Tom, 698-3918 after 6 p.m.

WINDSURFING SHORTBOARD - Tiga 285, great for first board, epoxy, $300; rainbow weedspeed fin, new, $45. Joe, Ext. 4139.

Furnishings & Appliances

CABINET - Colonial, maple, w/record player, radio, storage or TV area, 61"x3'x2' deep, $110. S. Saxon, 929-4701.

DESK - w/open-shelved hutch topper, country, stenciled, good parlor/bedroom piece, excel. cond., orig. $375, asking $130. Debbie, 325-1207.

DINING ROOM & BEDROOM SET - all wood, glass end & coffee tables; boat w/motor & sails; assorted bric-a-brac lamps. Ivan, Ext. 7874.

DINING ROOM - oval table w/leaf, 6 wrought iron chairs, $80; 2 china cabinets, $30/ea. 744-7172.

BEDROOM SET - queen-size bed, end tables, dresser w/mirror, armoire, $690 neg. Ext. 4661.

BEDROOM SET - 5-piece, traditional, armoire, dresser, 2 night tables, bed, 2 mirrors, $350. Bob, Ext. 3457.

COUCH & CHAIR - gold stripe/green, $100; swivel rocker recliner, brown, $50; swivel rocker, gold/green print, $25; all excel. cond. Paul, 727-4859.

DINING ROOM SET - table, 6 chairs, 3 leaves, buffet, china closet, walnut finish, $225. 475-9343

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

DINING ROOM SET - Thomasville, pecan, 68" table, 3 leaves, 2 captain's chairs, 4 side chairs, serving cart, $750. Wegner, 286-8639.

DINING ROOM - cont., dark wood, table, 1 leaf, 6 chairs, china closet, buffet, 5-light chandelier, $350. firm. E. Grahn, Ext. 4792 or 265-3731.

DINING ROOM - table, 6 chairs, solid oak, 1930s vintage; 2 sets of bone china; credenza. 286-0466.

KITCHEN SET - solid maple, 6 chairs, $75; IBM elec. typewriter, old; f/p log holder, $20; card table set, $20; much more. Ext. 2345 or 929-8443.

REFRIGERATOR - good spare, $25. Sue, Ext. 7235.

REFRIGERATOR - Hotpoint, 32"x25"x64", approx. 10 yrs. old, working cond., almond, $75. Frank D. Ext. 2022.

REFRIGERATOR - Whirlpool, 20 cu. ft., self-defrost, white, 2 yrs. old, $525; washer/dryer, GE, white, $75/ea., or $125/both. Irving, Ext. 2827

VACUUM - Eureka, upright, attachments, $35; coffee maker, $5; GE dishwasher, convertible, 2½ yrs. old, wood top, mint cond. Ofra, 821-6856.

Tools, House & Garden

ELECTRIC MOTORS - used, $5/ea.; push lawnmower, $7; kitchen metal cabinet, $5; 5-piece bedroom set, needs handles, $95. 878-6637.

FENCE - 120', used, three-rung split rail, $125. Al, Ext. 2795.

GARAGE DOOR - w/opener & remote, like new, single car, $350/both. Sue, Ext. 7235.

KEROSENE HEATERS - 2, radiant, $50; Black & Decker elec. lawn mower, $50; George, Ext. 2343 or 563-2889.

LAWN MOWERS - rotary, 1 Snapper, 1 Craftsman, almost new cond. Frank, Ext. 3120.

LAWN MOWER - riding, 26" cut, 5 h.p., pull start, w/Craftsman swiper, $300 neg. Joe, Ext. 4986.

LAWN MOWERS - riding, 5 h.p., $350; 3½ h.p., self-drive, rotary, w/bag, $65; 3½ h.p., 22" cut, self-drive, rotary, $65. Dan, ext. 4987 or 698-7322.

LAWN MOWER - riding, Gilson/Toro, 26" cut, pull start, reconditioned, $200. John, Ext. 4028.

SHALLOW WELL PUMPS - 2, filters, tanks, complete systems, $75/everything. Bill, 878-6016.

SHALLOW WELL PUMP - w/integral pressure tank, 4 yrs. old, 110/220, $100 neg. Ext. 3844.

SNOW THROWER - Toro S-620E, elec. start, 20" path, excel. cond., w/spare scraper, $175. 475-9343.

TOPSOIL - fine screened, $20/per yard, delivered, 3 yd. min. 696-6011.

Sports, Hobbies & Pets

BICYCLES - 2, Raleigh, woman's, 3-spd., $70; Fuji, man's, 10-spd., upright handlebars, rear rack, $50. Chuck, 567-5409.

BIKE - Cilo Sport-SE, SIS gear, used twice, 30 miles, $250; Cilo helmet, $50. Larry, Ext. 4295.

BIKES - 2, men's, 3-spd. & 10-spd.; rowing machine, make offer. Sue, Ext. 7235.

FERRET - 3 mo. old, female, cute, 2 cages, all access., asking $230. Sally or Graham, 821-1726.

GAME TABLE - octagonal, converts to poker/bumper pool, no chairs, $125; library steps, glass, lighted, $100; both $200. Irving, Ext. 2817.

GO CART - 5 h.p., knobby tires, alum. diamond plate floor, custom pedals, seat belt, $350. Dan, Ext. 4987 or 698-7322.

KEYBOARD - Casio 202, full size, stand & cover, $75; O'Brien Black Magic knee board, like new, $75. Richie, Ext. 2175 or 734-7342.

LABRADOR RETRIEVER PUPPIES - black, AKC registered, sire and dam on premises, great w/children. 929-4993.

TRANSCEIVER - Kenwood TS930, w/ant. tuner, CW & SSB filters, mint cond. Don, Ext. 2694.

Audio, Video & Computers

AMPLIFIER - guitar, Ampec Portaflex w/speakers, $200. Harry, Ext. 5976.

CAMCORDER - Sony, 8mm w/case & accessories, ask. $500 neg. Mike, Ext. 4199.

CASSETTE TAPE DECK - 3-head Dolby system, RK-D600, microphone, headphones, tapes, new cond., cost $400+, now $100. Saxon, 929-4701.

COMPUTERS - 2 Commodore C64, two 1541 disk drives, printer, joysticks, misc., all for $250. 689-7123 eves.

COMPUTER - Commodore 64, MPS-1000 printer, mouse, software, no monitor. Ext. 4844.

COMPUTER - C128, printer, disk drive, modem, Mach 128, C-compiler, CPM-kit, many programs & flight simulators, like new. Don, Ext. 2694.

TV - b/w, great 2nd set, works well. Frank, Ext. 3120.

Miscellaneous

BABY'S ITEMS - toys, clothes, bedding items, baby carrier, $5; bathtub, $4. Ofra, 821-6856.

CASH REGISTER - old National, brass w/marble plate, works, $50. Chuck, Ext. 4688 after 6 p.m.

JUICER - fruit & vegetable, Moulinex, in box, orig. $79, asking $35; paperback books, various subjects, make offer. 474-3799 afternoons.

LUGGAGE - suitcase, $15; overnight, $15; pullman, 29", $30; 2 printer's boxes, $30, $35. Pat, Ext. 3807.

PROM DRESSES - peach satin, size 7/8; black/white plaid, black velvet trirn, size 12, $20 ea. 473-6546.

MAPLE SYRUP - from my family's farm in Vt. Peter, Ext. 7687 or 744-1112.

TYPEWRITER - Brother ZX1900, word processor w/LCD display & memory, 256k Simms memory modules for IBM compatible PC. Ext. 4844.

VACATION - 4 nights in Ft. Lauderdale, 2 nights in Bahamas, roundtrip, Discovery I cruise for 2 adults, $400. John, Ext. 5883.

WEDDING GOWN - size 10, sweetheart neckline, lace bodice. Steele, Ext. 3496

Free

KITTENS - healthy, cute and lovable. 363-7032.

WOOD PLATFORM - for ag pool, w/seats, liftable ladder; leftover wood, bring truck. Ext. 2259.

Yard & Garage Sales

ROCKY POINT - 6/6-7, 32 Hemlock Rd., take Broadway to King, 3 blocks west on King.

Car Pools

NJ/BRONX/QUEENS - John, Ext. 5709.

SHINNECOCK HILLS, SOUTHAMPTON - need ride Mon. & Wed., 3-5 p.m., time neg. 283-6071.

Wanted

BIKE RACK - to fit 81 Chevy Blazer, reasonable. Kathy, 821-2586.

CANOE - 15'-17', alum. or fiberglass. John, Ext. 7671 or 765-1299.

CBX - Honda motorcycle, running or not, 6 cyl. 79-82; 6-door freezer and a bread slicing machine. Chuck, Ext. 4688 after 6 p.m.

HOUSE TO SIT - free, experienced, caring, avail. any period from 6/19-9/30. J. Allentuck, Ext. 2412.

HOUSEMATE - for large, furn. room, spacious house w/mod. kit., lg. l/r-d/r, $320/mo. Ext. 7897 or 689-2958.

LAWN MOWERS - and lawn tractors, old, complete. Dan, 698-7322.

OUTDOOR TOYS - such as cars, activity gym, or playhouse. Ofra, 821-6856.

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.*

ALTERATIONS - men's & women's clothes. Theresa, 289-0898.

BABY-SITTER - exp., responsible, 19-yr.-old, avail., day & night beg. 6/8. 286-5897.

BABY-SITTER - mom of one to care for your child in Eastport home, M-F after 1 p.m., Saturdays/Sundays, reasonable. Debbie, 325-1207.

BABY-SITTER - exp. high school sitter avail. after school & weekends, avail. all summer. 341-1055.

CAKES - custom decorated, all occasions, order for graduations, confirmations, birthdays, pies, cookies, mini pastries also avail. Millie, 367-4147.

CARPETING - discount purchase, installation & repair, custom work, stripes, borders, printing in carpet. Mark. 399-2813.

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

CHIMNEY SWEEPS - fireplaces, wood, coal, oil flues, chimney repairs, custom caps, stainless steel or copper. Mike, 821-5526.

COLLEGE FINANCIAL AID - guaranteed, fee refunded if no aid, computers match w/student's background, Lab disc. Tom, 736-6691.

DECKS - custom, cedar, CCA, 20 yrs. exp. Danny, 698-9274.

DECORATIONS - balloons, misc., for theme party, prom, wedding, etc. Mary, 924-9397.

DJ/MC - The Music Connection, music from 40s-90s, quality sound/service at affordable prices, all occasions, insured., let's party. Lou, 698-8210.

GROOMING - dog, cat, ferrets, etc., discount, will pick up & deliver, all breeds. Jen, 727-3830.

HANDYMAN - painting, Sheetrocking, spackling & landscaping, any home repairs. John, 929-3407.

HOUSECLEANING - any time, references available, reasonable price. June, 369-8447.

HOUSECLEANING - dependable, reas., responsible, hardworking, refs. Cathi, 281-0360.

JEWELER - repairs, special orders, expert workmanship, honest, affordable, no job too large or small. Kelly, 821-5239.

LAWN CARE - maintenance, general cleanups & service. Ryan, 878-1178.

LAWN MOWER & LAWN TRACTOR REPAIRS - reasonable rates, fast service, have trailer will travel. Dan, 698-7322.

LOCKSMITH - sales & service, 10% Lab discount, keys cut during lunch. Pete, Ext. 5105 or 399-2813 after 5 p.m.

MAILBOXES - custom-made & installed, 9 distinctive colors, heavy-gauge metal or wood, free custom numbers/lettering. Mike, 821-5526.

PARTY TENT - 20'x30' w/side curtains, we set up & take down, $250/38 hr. 321-2889.

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

ROOFING, SIDING & IMPROVEMENTS - all major & minor home/ business repairs. 878-1178.

SEAMSTRESS - clothes made & altered, reasonable prices. Donna, 924-1684.

SILK FLOWERS - arrangement & baskets, great gifts for family, friends, sunshine clubs, add beauty to any home decor. Maureen, 360-3803.

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

TENNIS LESSONS - all ages & levels. 286-5897.

TRAINING - dogs, all breeds, obedience/family, all levels, discounts, refs. avail. Jen, 727-3830.

TUTOR - Does your child need reading help? Experienced K-12 reading tutor avail.; also other elementary subjects, $15/hr. Tara, 447-6641.

TYPING - letters, resumes, desktop publishing, graphics, using WordPerfect autoCad, reas. prices, professional service. Jack, 369-8447.

WRITING TEACHER - workshop for 8-10 yr. olds; 5 days, 7½ hrs. of instruction, 7/13-17, sessions 10-11:30 or 1:30-3 p.m. Bob, 724-2937 eves.

In Appreciation

Thanks to all my friends for a beautiful farewell. Bless you all. —Art Anderson

We thank all of our friends and coworkers for their kind and thoughtful expressions of sorrow, sympathy and comfort upon the loss of our youngest son, Everett, following his long illness. — Grace & Alvin Vestal & Family

Ads left out of this issue due to lack of space need not be resubmitted to appear in the next issue.