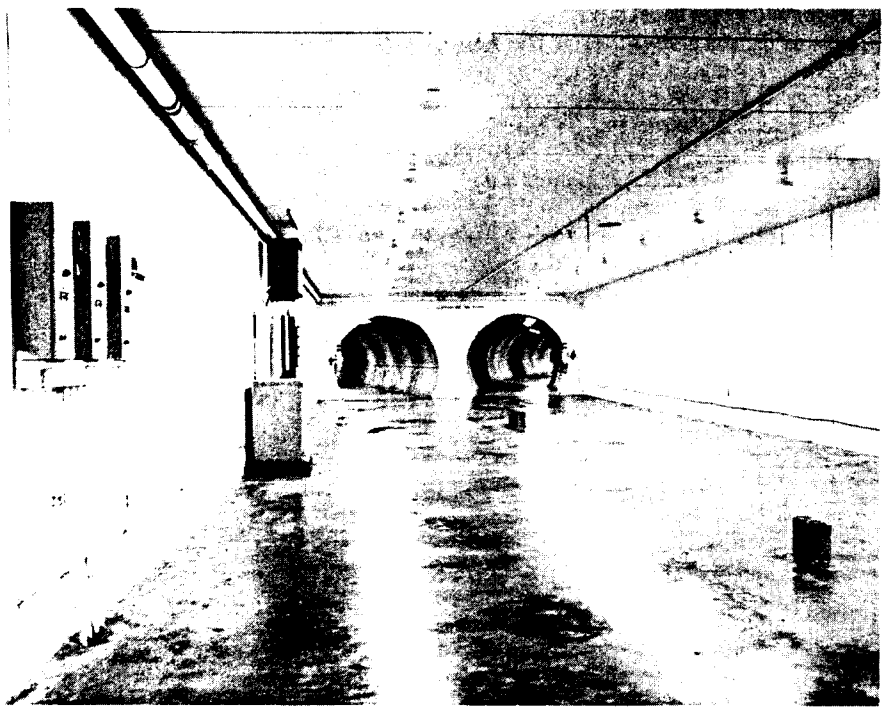
BROOKHAVEN BULLETIN

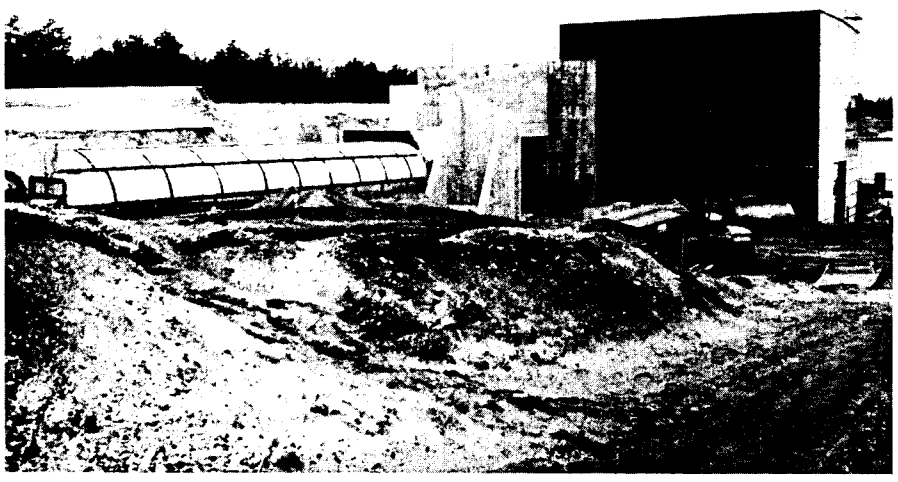
Vol. 36 - No. 13 April 2, 1982

BROOKHAVEN NATIONAL LABORATORY



Mort Rosen

About 98% finished is the South Injection Transition Section. As part of the injection system for ISABELLE, this is the point at which the pipe carrying the beam lines splits into two, in order to inject each of ISABELLE's rings separately. With the completion of the Service Building at the end of this year, the majority of the conventional facilities for ISABELLE will have been finished.



Mort Rosen

Last January, the experimental hall at the 8 o'clock intersection of ISABELLE's two rings was about 85% complete. The tunnel leading to it (at left) was finished but still exposed. Today, the tunnel is covered with earth and the Major Facility at 8 o'clock is 90% complete.

ISABELLE's Place in U.S. High Energy Physics As Seen by Trilling Subpanel

The final report of the Subpanel on Long Range Planning for the U.S. High Energy Physics Program, known as the Trilling report after the Subpanel chairman George Trilling, has been submitted to DOE as a guideline for the future.

The 60-page report deals with all aspects of the U.S. high energy program and looks closely at the current and proposed facilities at the DOE high energy accelerator laboratories — SLAC, Fermilab and Brookhaven, and the NSF-funded accelerator at Cornell. It also describes the accelerator facilities available in Europe, Japan and the U.S.S.R., and the possibilities for international collaboration on the building of future accelerators. It specifically states that ISABELLE would be especially appropriate for world-wide use.

The Subpanel was charged with developing a national high energy physics plan for the next decade, at three possible funding levels, with particular attention to be paid to the role of ISABELLE. The levels of $440 million and $395 million are of particular interest to Brookhaven. (At the lowest level of $360 million there would certainly be no ISABELLE, no AGS, and the state of U.S. high energy physics would be sorry, indeed.)

There is general agreement among Subpanel members that "construction of a substantial new facility to be ready for research by the end of the 1980's" is a major requirement for a flourishing high energy program. Current accelerators will be too old to address physics questions of the future. The Tevatron I collider, now under construction at Fermilab, and the proposed SLAC Linear Collider will offer a limited number of interaction regions where experiments could be done.

But the nature of this new facility will depend on the amount of money available. At $440 million, it's full steam ahead with ISABELLE. Although this funding level has not yet been reached, the Trilling subcommittee allows a period of grace. It assumes that such a level will be reached by FY 1984, "or at the latest FY 1985." In the meantime, it recommends that magnet R&D be the focus of concentration at Brookhaven.

At $395 million (1982 dollars) the

(Continued on page 3)

Perspectives On ISABELLE

The Fiscal Year 1983 budget that President Reagan submitted to Congress in January included no funds for ISABELLE construction, although funds were substantially increased for extensive R&D on its superconducting magnets. The President's budget request is now being considered by Congress, and it is hoped that construction funds will be restored during that process. One of the accompanying articles itemizes some of the arguments for keeping ISABELLE a vital part of the U.S. high energy physics program. The other summarizes the role of ISABELLE in the program as reflected in the final Trilling report.

Behind many an important discovery lies a unique instrument. During the Renaissance, Galileo constructed the first complete astronomical telescope, which led directly to the confirmation of Copernicus' revolutionary theory of the solar system. Fifty years ago, John Douglas Cockcroft and Ernest T.S. Walton used an electrostatic accelerator to produce nuclear disintegrations. This development led to cyclotrons, linear accelerators, synchrotrons, colliding beam storage-ring devices and more, without which we would have little knowledge of such things as the nucleus, radioactivity, nuclear medicine and fusion power.

ISABELLE is a unique instrument that shares this potential for discovery. The proton beams in ISABELLE's two rings will collide at six intersections where energies available to create new matter will reach 800 GeV. Physicists believe that this energy region may be rich in new phenomena. The words of the 1974 report of HEPAP's Subpanel on New Facilities are relevant: "In the past, the opening up of a new energy region always has shown that nature is much richer than we had predicted from the results at lower energies. It is difficult to express in guarded terms the enthusiasm generated in the high energy physics community by the prospect of such major breakthroughs."

The report goes on: "The Subpanel as well as the community of physicists feels strongly that such a dispersal (PEP on the West Coast, TeV in the Midwest, ISABELLE on the East Coast) provides the diversity of physics, style and intellectual input which is desirable for a fruitful scientific endeavor." Subsequent HEPAP studies have continued to emphasize the importance of the multi-Lab concept for the U.S. high energy physics program.

In Physics Today (January 1982), John Marburger, president of the State University of New York at Stony Brook, said, "The profound insights come only after long scrutiny of nature's actual behavior. And that requires apparatus: apparatus both to aid the eye and to stimulate something worth seeing." ISABELLE will "aid the eye" with extremely high luminosity, implying a high rate of particle collisions. With luminosity 100 to 1000 times higher than any similar machine, with energies up to 800 GeV, ISABELLE is expected to stimulate many things worth seeing. When physicists set up their experimental equipment, here are a few of the things they will be looking for:

• **W and Z** - One theory holds that the carriers of the weak force (responsible for radioactivity) are intermediate bosons called $W^{\pm}$ and Z. Even if other accelerators detect the W's or the Z before ISABELLE is completed, Larry Trueman, deputy chairman of the Physics Department, said, "ISABELLE's high luminosity will make it possible to study the properties of these bosons in detail, with a greatly reduced experimental error, and so, for example, permit accurate measurements of the W mass. This cannot be done anywhere else."

• **t-quark** - So far, physicists have found five quarks and have postulated the existence of a sixth, called t. While the mass of the t-quark is unknown, there are two reasons to believe it may be found in ISABELLE's energy range: lower energy electron-positron colliders have failed to find it and the first five quarks have been found to be successively more massive. "ISABELLE should be able to produce the t if its mass is as high as 100 GeV," said Trueman. "If it's higher than that, it would be hard to find it anywhere."

• **Jets** - These sprays of particles may be formed by the interactions of quarks escaping the pull of coupling particles called gluons. The interaction of quarks and gluons is described by a theory called QCD. ISABELLE's high luminosity will provide far more jet events than any other machine and help physicists to test the validity of QCD.

Beyond these predictions of the model of elementary particles, Trueman pointed out that ISABELLE will be used to study the new physics at much higher masses, to search for the elusive Higgs boson, to explore the predictions of more far-reaching theories such as the super-symmetric theory which unifies bosons and fermions, and the technicolor theory which aims at exploring the origin of mass. There are several new particles predicted to be in the mass range that can be studied at ISABELLE, up to around 300 GeV. The discovery of one of these would have a revolutionary effect on our understanding of matter. To quote Nobel laureate S.C.C. Ting, "The physics of ISABELLE is unique. It is the only accelerator with true potential for discoveries beyond our expectations."

BNL's acting director Nicholas Samios has said, "ISABELLE will provide the cornerstone of the U.S. high energy physics program." And Stony Brook's John Marburger wrote, "It is the only accelerator currently under construction that is capable of maintaining American competitiveness in high energy physics."

Superconductivity occurs when electricity flows with no resistance through certain materials at very low temperatures. Since the electricity is not dissipated in resistive heating, to operate electrical equipment built with superconductors costs relatively little, requiring power only for running a cryogenic system. ISABELLE will use over 1100 superconducting magnets to shape and guide the proton beams. R&D efforts have aimed at perfecting those magnets and the cryogenic system that will cool them to temperatures below 3.8°K. Results have been highly successful. The magnets have proved powerful and reliable, even exceeding the ISABELLE performance specifications. The helium refrigerator will be the largest in the world. These technologies may prove to be directly applicable to other potential uses of superconductivity, which range from electrical power transmission to more efficient generators and even magnetic fusion.

Besides superconductivity, groups are working in high vacuum, computer controls, data processing, electronic devices and detector develop-

(Continued on page 2)

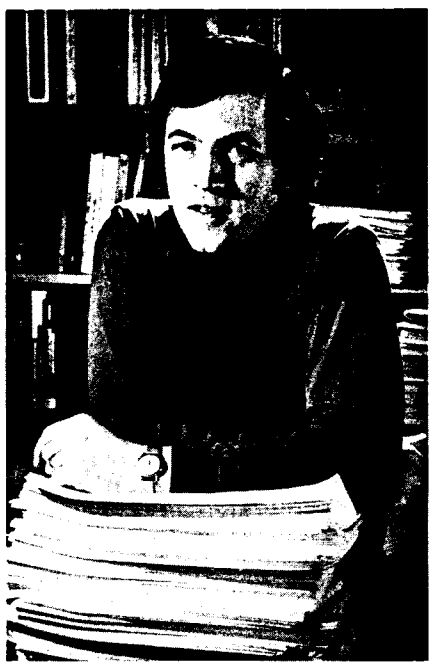
BNL Lecture On Theoretical Chemistry

Just as some medical doctors opt for psychiatry and stay out of the operating room, many chemists happily stay out of the lab and do their own special brand of "experiment," implementing a variety of theoretical models with the help of high speed digital computers such as the CDC 7600 at BNL.

So says Marshall Newton, Senior Chemist, who will be giving the next Brookhaven Lecture on Wednesday, April 14. Beginning at 8 p.m. in Berkner Hall, Newton's talk is entitled "What Does Theory Do For Chemistry These Days?"

According to Newton, in the last decade quantum chemical calculation of geometrical and electronic structure for molecules and clusters has become an indispensable tool in predicting and interpreting a wide range of chemical phenomena, especially in cases where key features are difficult or impossible to probe with conventional experimental techniques. The theoretical calculations not only yield numbers for given properties (the *observables*) but also rationalizations of these numbers (often in terms of *"non-observables"*).

Newton's work deals with small molecular species which are frequently chosen as models for crucial quantum-mechanical behavior in much more complex systems. Examples are small silicon oxide clusters (models for extended silicates) and "supermolecules" formed from two transition metal complexes in close proximity (models for electron transfer reactions in aqueous solution). In other cases the clusters are of interest *per se:* e.g., small clusters of nickel atoms (an example of the type of system whose electronic properties may soon be amenable to direct probing at the



Marshall Newton

NSLS). In another project, the systematics of subtle cooperative aspects of OH...O hydrogen bonding have been elucidated in research stimulated by a plethora of structural data obtained at the HFBR.

In his talk, Newton will give the flavor of the methodology and principal conclusions from some of the above studies, emphasizing the evolution of the coupling of theory and experiment.

Marshall Newton holds a Ph.D. in physical chemistry from Harvard University. He joined the staff of BNL's Chemistry Department in 1969, and is currently assistant department chairman, while continuing basic research in theoretical chemistry. Newton has been a member of the BNL Council (1976-79) and the Computer Users Organization Steering Committee (1979-82).

On the evening of the lecture, a buffet supper is served at 6:30 p.m. at the Brookhaven Center. The price is $7.25, and reservations should be made by calling Ext. 3541 before 5 p.m. that day.

1984 Budget Is On Its Way

Many things bloom in the spring and the budget is one of them. It is an annual cycle, starting with the presentation of our budget to DOE by April 1. Then a couple of months later, DOE forwards its total package to the Office of Management and Budget (OMB). After a lot of adding and subtracting, OMB eventually compiles the President's Budget for the Federal government which is presented to Congress in January. Congress then proceeds with the resolution of differences within that body and with the President. The final step is the signing of appropriations bills at The White House releasing funds approved for the various departments and agencies.

Often there is considerable overlapping. For instance, the money for Fiscal Year 1982 (which started October 1, 1981) finally came through in December last; the FY 1983 budget is now undergoing Congressional scrutiny; and on March 30th our request for funding in FY 1984 was shipped to Washington — all 2,947 pages of it.

BNL's current budget submission reflects several different years. It not only includes Brookhaven's funding needs for FY 1984, but a summary of what we were given under the President's Budget for FY 1983, our revised request for FY 1983, and a listing of how the FY 1982 money is being spent.

For FY 1984 Brookhaven is asking for a total of nearly $272 million. This will take care of operating expenses, inventories, capital equipment and construction projects. This figure includes a 9.0% rate of inflation for operating expenses and 7.9% for capital equipment. "We do our own economic forecasting," says Don Robbins, Deputy Budget Officer. "Brookhaven has been doing its own inflation analysis for a number of years."

This effort was further reinforced when, in the fall of 1981, John Hauser of the BNL Budget Office, in collaboration with DOE's Independent Cost Estimating staff, developed a model that forecasts cost escalation rates at BNL. This model uses historic Laboratory data as well as selected cost indices from Data Resources, Inc. It also draws from credible economic forecasts enhanced by local information which has a significant effect on BNL costs. Among the latter items are employee salaries (which must be competitive with the market), and fuel and electric power sources, i.e., BNL's Alternate Liquid Fuel and the PASNY power diverted to the Lab from upstate.

The largest item in BNL's FY 84 operating budget is $70,500,000 for High Energy Physics. A not very close second is Materials Sciences at $24,440,000, followed by Chemical Sciences at $15,895,000, Environmental R&D $12,445,000, Life Sciences Research and Nuclear Medicine Applications $12,395,000 and Nuclear Physics at $8,500,000. Other operating requests are in the $3 million range or less.

High Energy Physics gets the lion's share in the budget request for capital equipment, and a high level of funding is requested for Chemical Sciences (includes NSLS) and for Life Sciences Research and Nuclear Medicine Applications.

New construction requests are for additional experimental beam lines at the NSLS, and the installation of a new tandem-type accelerator. General purpose facilities are proposed for cogeneration, central chilled water and fuel storage. Funding has also been requested for various accelerator improvement projects and general plant projects.

The preparation and assembly of the budget took about three months this year, and began in mid-December. The departments had until February 16 to submit their final Field Task Proposals to the Budget Office. Getting the budget ready is a trying time for everyone, and Robbins says that "there is much joy in Mudville when we get that thing out." He estimates that the Budget Office alone puts in 700 hours overtime in a two-month period. And by the time the number of copies required for distribution in Washington were made, 198,000 pieces of paper had gone into the making of the budget for FY 1984.

Louis DiCarlo and James Pittman (at rear) of Supply & Materiel Division load part of the budget into a station wagon in preparation for a trip to Washington. Lending a hand are Don Robbins and Helen Caisey of the Budget Office. The station wagon was driven to Washington on Tuesday and the budget safely transferred to the appropriate offices by Mike Correa, Supply & Materiel.

—Photos this page by Humphrey

ISABELLE Perspectives

(Cont'd)

ment. "We try to use industrial technologies, but sometimes we need to develop techniques beyond what is presently available," said Tom Ludlam, head of the ISABELLE Detector Development Group. "Because of the symbiotic relationship between high energy physics and industry, some of these techniques may be picked up by industry to come back to society in a more immediately beneficial form."

One such spinoff could be RELWAY - the reliable process data highway developed to connect the myriad components of ISABELLE's control system. RELWAY uses standard techniques and parts from the cable TV industry to create a multi-band version of a popular type of single channel communications data system. Rusty Humphrey, head of the ISABELLE Control Group, said, "RELWAY has created considerable interest in industry and may soon be used commercially."

Detector development often requires new techniques. A detector must pick out the significant signals from the millions that pass through it each second. To make these decisions and record essential data from the large number of events (50 million per second) that ISABELLE's high luminosity will foster, the electronics must operate more quickly than ever. An ultra high-speed electronic logic device developed by BNL physicist Ed Platner will be used in ISABELLE's detectors. And since it can access data at speeds in excess of 330 megahertz, it is so attractive to industry that efforts are now underway to make this device commercially available.

Each of ISABELLE's detectors must surround one of the six points where the two proton beams collide. This imposes space limitations that render some existing types of detectors impractical. Addressing this problem, BNL physicists Dick Strand and Sam Borenstein are developing optical fibers of scintillating material to replace conventional scintillation counters, and tiny photo-diodes to replace bulky photo-multipliers. Now being tested, "this idea represents a totally new technique for detecting particles," said Ludlam.

In listing ISABELLE's benefits, it becomes obvious that the human element is a very important one. Some of the country's best scientific personnel are being trained and challenged at ISABELLE. These scientists and engineers will feed into many streams of American life and invigorate our technical know-how.

The spinoffs from ISABELLE - those which exist and those which are predictable - make a long and varied list. Still, many benefits will not be listed until ISABLLE is completed and the needed technology is developed along the way.

No one knows exactly what rewards will ultimately be reaped from ISABELLE. But in pushing technologies to their limits, in helping physicists probe ever more deeply into matter, ISABELLE will surely be a unique instrument with a unique potential for discovery.

Beware The Dogs

The BNL police report that a pack of wild dogs has been noticed on site and has already killed two deer in the Biology field. The police are anxious that runners, particularly, be aware of this situation and be on the lookout.

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Published weekly
for the employees of
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Trilling Report (Cont'd)

Subpanel concludes that "construction of this scientifically valuable facility [ISABELLE] would have to be abandoned in its present scope." Therefore, it suggests that a lot of thought be given to "a start by the mid-1980's on a new high energy construction project" more modest in cost. Among such projects being studied is "an electron-proton collider or a less expensive high luminosity ($L=10^{33}cm^{-2}sec^{-1}$) hadron-hadron collider built in the ISABELLE tunnel."

The Trilling report notes that a substantial high energy physics program could be maintained at the $395 million level until late in the decade, but by 1990, the lack of an ISABELLE would be apparent. A less expensive new facility, with fewer opportunities for experiment would be adequate, but "the U.S. effort, while of high quality, would be less competitive."

The Reagan budget for FY 1983 has earmarked $429 million for the U.S. high energy physics program. This is approximately the second level of funding considered in the Trilling report —$395 million in 1982 dollars. At this level, zero money is requested for ISABELLE construction, but funds are recommended for magnet research.

ISABELLE is by no means down and out, and it should be noted again that the Subpanel supports the construction of ISABELLE if increased funding is provided by FY 1984 and even as late as FY 1985. As a matter of fact, there seems to be an upward trend. The FY 1983 budget for high energy physics in the U.S., as it now stands, is considerably larger than that for FY 1982, and this could be taken as a move toward the higher level necessary for the continued construction of BNL's accelerator.

BNL Bike Care

Users of BNL-owned bicyles are expected to perform incidental maintenance to prevent unnecessary wear or deterioration resulting from neglect or abuse. Such procedures as chain lubrication, tension adjustments or checking tire pressure should be done as a routine matter. Tires and tubes are available from the Bulk Warehouse, Bldg. T-158.

The Laboratory also maintains a service contract with a commercial bicycle repair shop for services as needed. When a bicycle needs repair, the user should prepare a shipping memo and forward it to the Shipping Section, Bldg. T-89.

Arrivals & Departures

Arrivals

John H. Taylor ..... Nuclear Energy

Departures

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

Gregory P. Ballantyne ..... Biology
Norma R. Cicale ..... Chemistry
Lee Colsmann ..... Accelerator
Teresa Kelley ..... Biology
Julia S. Larsen ..... Accelerator
Patrick J. McGauley ..... Energy & Env.
Ronald W. Squire ..... Central Shops
Mary Pat O. Takacs ..... Saf. & Env. Prot.
Peter Z. Takacs ..... Instrumentation

Plan Now For Nursery School Next Fall

If you have pre-school toddlers, consider enrolling them in the Upton Nursery School. Applications are now being accepted for the 1982-83 term, which begins in September.

The school's aim is to foster the development of children as they learn to respect themselves, their environment and the various ways of others. A wide range of activities are offered that allows a child to explore his or her capabilities, identity and environment. No formal academic subjects are taught. Instead, children are free to experiment with such activities as art, music, nature study, stories, water play, outdoor play and cooking.

Classes are for three and four-year-old children, from 8:30 to 11:30 a.m. You can select a schedule of three mornings a week or two mornings a week.

The school's three certified, professional teachers, Reneé Bloch, Polly Carroll and Susan Kossiakoff, hold graduate degrees and have had extensive experience teaching young children. The staff feels that a child at the age of three and four begins to learn self confidence and is interested in socializing with children of the same age. The Upton Nursery School provides a good opportunity for children to interact with each other. The school is unusual in that children from different countries attend, and everyone learns to accept and enjoy the varied language and cultural differences.

Doug Humphrey

Teacher Susan Kossiakoff with some Nursery School alumni.

Another advantage of the school is that parents can be directly involved with the development of their children. Parents of children enrolled are members of the Upton Nursery School non-profit, self-governing corporation and therefore have a vote in matters concerning the school. Also, parents rotate as assistants to the teachers (although other arrangements can be made for a substitute).

Tuition is $460 a year for classes three mornings a week or $320 a year for classes two mornings a week. Tuition can be paid in installments.

Applications can be picked up at the cafeteria or from Karen Brunschwig, 924-0030; Janice Thern, 929-3550; or Ruth Fernow, 928-8465. A written request can also be sent to: Upton Nursery School, Box 324, Upton, N.Y. 11973.

If you want to see the school in action before enrolling your child, make an appointment by calling between 11:30 and 11:45 a.m., Monday through Friday, at 282-3033, or call one of the persons named above.

Golf

An organizational meeting of the BERA Golf Association will be held on Friday, April 9 at 5:15 p.m. in the Recreation Hall. Membership applications are being mailed to last year's members. Prospective members may obtain an application by calling Ron Webster (Ext. 2845). Membership in the league is open to all employees, their spouses, and retired employees.

Speakers Bureau

R.C. Anderson (DO), Kiwanis Club of Riverhead, The Relation of Energy to the Economy, January 5.

Debbie Appio (AUI); **Harriet Fadem** (Accel.); **Frances Scheffel** (DNE), Center Moriches High School, Support Services to Science, January 19.

Martin Plotkin (Accel.), Rotary Club of Valley Stream, BNL General, February 16.

Jan Naidu (S&EP), Suffolk County Community College, Environmental Pollution/Radiation Hazards, February 17.

Eva Bozoki (NSLS), Career Service Center at C.W. Post College, Careers in Physics, February 25.

John Usher (DNE), Kings Park High School, Nuclear Fusion, February 25.

Louis Harson (PE), Senior Citizens of St. John's Church of Southampton, Camp Upton, March 1.

Betty Heldman (Med.), North Babylon High School Career Day, Medical Research at BNL, March 11.

Russell Dietz (DEE); **Norman Holden** (DNE), Shelter Island 17th Annual Science Fair, Science Fair Judges, March 12.

Frances Brown (Bio.); **Eva Emmerich** (Accel.); **Eena Mai Franz** (DNE); **Marian LeFevre** (Med.), Shoreham-Wading River Title IX Awareness Day Seminar, Non Traditional Careers, March 12.

Jeanne Yermakoff (Med.), Baldwin High School Career Day, Pharmacology/Toxicology, March 18.

R.C. Anderson (DO), Custer Institute, Prospects for the Third Millenium, March 20.

Deborah Appio (AUI); **Sharon Smith** (DEE); **Ruth Wright** (Bio.), Suffolk County Community College, Women in Math and Science, March 26.

PSI News

For those who wish to become charter members of the Upton Chapter of Professional Secretaries International (PSI), today is the deadline for submitting the full registration fee of $46. Checks, payable to Queen Anne Chapter, PSI, should be delivered to Pat Towey, Bldg. 120.

Those who have the classification of Secretary, or who can describe their particular positions as ones which carry out secretarial duties, are eligible to join. The organizers are aiming for an early May installation of the Upton Chapter.

Bowling

White League

The Flounders moved into first place. S. Smith rolled a 199, J. Griffin 204, N. Tyler 199/210/588, C. Zopf 207, N. Carter 231.

Purple League

C. MacDougall had games of 211/234/173 for a 618 scratch series, A. Pinelli 178/236/206 for a 620, E. Sperry 217, K. Riker 217, E. MacDougall 202, B. Benson 204/201, W. Milian 213, M-G Meier 201/183/188 for a 572, B. Jellett 192, G. Riker 202.

Red & Green League

High games were rolled by E. Gill 233, G. Meinken 230, A. Pinelli 220, J. Connelly 220, T. Prach 217, H. Marshall 204, H. Arnesen 202, C. Bohnenblusch 201.

Pink League

A. Donegain bowled a 182, M-G Meier 189, H. Keeley 182, M. Connelly 165/161, J. Thiede 184.

L.I. Industrial Tournament

The Lab team finished fifth overall, 158 pins over average. They also had the high single game of the tournament with a 1067. Good games were bowled by R. Jones 234/612 scratch, M. Iarocci 233/204, J. Morris 209, K. Riker 203.

Hospitality News

At the next Hospitality Committee morning get-together, which will be held Tuesday, April 6, from 9:30 to 11:30 a.m. in the Brookhaven Center, Lisa Hendry will demonstrate various aerobic exercises. After the demonstration, Ms. Hendry will conduct a short exercise period for those who would like to do the exercises. If you plan to participate we suggest that you wear comfortable clothing, such as loose-fitting slacks or a bodysuit and leotards.

All wives of Laboratory employees and guests are welcome. Please come and bring the children. Babysitting will be provided free of charge.

Volleyball

A Division

Teddybares	15-3
Dinkers	13-5
Mixed Ups	12-6
High Society	10-8
Nuts and Bolts	8-10
Las Bolas	1-14
Leftovers	1-14

Congratulations to the Teddybares as winners of the last third. Next Monday, April 5, make-up games from December 21, 1981, will be played starting at 5:30. The original schedule for December 21 will be followed.

B Division

Final standings for the 2nd quarter

Puff and Stuff	11-4
Semi Tough	11-4
Big Boopers	8-7
TNT	7-8
KMA	4-11
Quirks	4-11

A playoff between Semi Tough and Puff and Stuff will be held at 5:30 on April 5 for the winner of the second quarter.

Special NYC Trip

In addition to the regular Wednesday LIRR trips to New York City, the Hospitality Committee will sponsor a group trip to the city on **Saturday, April 17.** Departure will be at **8:31 a.m.** from the Patchogue LIRR station. Round-trip fare for adults is $3.50, children under six years ride free.

Reserve a ticket by sending your fare through the U.S. mail to P.O. Box 322, Upton, New York 11973, **no later than April 12.** Please make checks payable to "Brookhaven National Laboratory," and put the date of the trip, your telephone number, and your BNL life number on your check. Reservations will be accepted on a first-come, first-served basis. Your tickets will be given to you on the train.

Additional Saturday trips to the city have been scheduled as follows:

May 15
July 31
August 28
October 30
December 11

Cafeteria Menu

Week Ending April 9

Monday, April 5

Cream of potato soup	(cup)	.60
	(bowl)	.70
Cheese omelet & 1 veg.		1.70
Turkey a la king on rice		1.70
Hot Deli — Grilled Reuben		1.75

Tuesday, April 6

French onion soup	(cup)	.55
	(bowl)	.65
Meatcakes & onions w/1 veg.		1.75
Broiled chicken livers & 1 veg.		1.70
Hot Deli — Chicken fillet parmesan w/tomato & lettuce	(on bread)	1.75
	(on roll)	1.85

Wednesday, April 7

Easter Special
Choice of
Cup of spinach egg drop soup
or
Small 6 ounce juice

Choice of
Roasted fresh ham
or
Poached fillet of fish with shrimp sauce

Choice of 2
Rice pilaf
Glazed baby carrots
String beans almandine

Choice of
Holiday cake
or
Assorted jellos
$2.15

Thursday, April 8

Chicken soup with matzo balls	(cup)	.55
	(bowl)	.65
Holishkes (stuffed cabbage) & 1 veg.		1.70
Chicken cacciatore & 1 veg.		1.75
Hot Deli — Baked ham	(on bread)	1.75
	(on roll)	1.85

Friday, April 9

New England clam chowder	(cup)	.60
	(bowl)	.70
Eggplant parmesan & 1 veg.		1.75
Fish & chips		1.75
Hot Deli — Pastrami	(on bread)	1.75
	(on roll)	1.85

Classified Advertisements

Autos & Auto Supplies

78 HONDA - 400cc, well maint., 6,000 orig. mi., some extras, must see. $1,000. Ext. 2926.

73 MAVERICK - 6 cyl, auto, am/fm cassette, 56,000 mi., garaged, mint cond., best offer. Ext. 2034 or 928-7042 after 5:30 p.m.

77 TRUCK CAMPER - 11' Aristocrat, loaded, mint cond., must sell. Mike, 878-1325.

71 HONDA - 350cc, CL, parts plus new tires and helmet. John, Ext. 4153.

74 FORD MUSTANG GHIA - p/s, disc brakes, a/c, am/fm, 8 track. Steve, 744-5752 after 5 p.m.

TIRES - Semperit 155, SR-15, Dunlop 185-VR-15, Volks 600-15 w/rim (2), 700-14 (1), snow 560-15 (1), 4 VW hubs. 369-2151 eves.

76 HONDA MOTORCYCLE - CB400F, 13K mi., all stock, mint, $800. Ext. 3146 or 654-2617.

75 FORD SUPER CAMPER - pickup and camper, 33,000 mi., both very clean, will sell separately. 286-8991.

74 HONDA CIVIC - hatchback, am/fm stereo w/cassette, economical, runs well, asking $950. 732-5829.

79 HONDA HAWK - 400cc, almost new, $1,495. 588-0805 eves.

TIRES - (2) Goodyear L235x15, steel belted radials, used, good tread, $50/pair. John, 589-2338.

69 CAMARO - nose less grill, front bumper and radiator, other parts, good cond., $250. Ken, Ext. 5385.

72 AMC HORNET - 2 dr, 6 cyl, auto, p/s, very good running cond., $475. Paul, Ext. 4474 or 473-3689.

VOLKS BEETLE - trailer hitch, heavy duty, $25; Beetle wheels, 2 ea., 4-hole, $5/ea. Gene, Ext. 3254 or 363-9527.

TIRE RIMS - (5) w/tire valves, GM 14" dia., 5-hole, 4-3/4" radius, 5" c/s, $80. 473-4477.

71 TOYOTA - Mark II wagon, good tires, new exhaust, extras, 77K mi., orig. owner, $650. 732-9102 after 5 p.m.

77 CHINOOK - Micro-mini Motorhome on Toyota chassis. Fully equipped, sleeps 4, 55,000 mi., 18-20 mpg, excel. cond., $7,500. Sam, Ext. 7205.

MOTORCYCLE CAFE FAIRING - black, for 7" headlight, hardware incl., $35. Bill, Ext. 2826 or 757-4329.

77 YAMAHA - 360cc, elec. start, excel. cond., extras, $700. John, Ext. 4185 or 929-8204 after 5 p.m.

76 VW DASHER - 4 dr., a/t, am/fm, $2,800 or best offer. Arnie, Ext. 2606.

68 OLDSMOBILE 88 - 8 cyl., 4 dr. sedan, runs well, $500. Jeanne, Ext. 2364 days or 281-6776 eves.

RIMS - (2) 16" Chevy, $6 ea. 732-6266 after 6 p.m.

75 MG - Midget, mint cond., new tires, muffler, shocks, tops, must see/sell. Buying new car. Damian, 744-5079.

80 SCIROCCO - 4 sp., am/fm, dark metallic green, 29,000 mi., excel. cond., $6,295. Ext. 2525 or 567-1812.

79 CHEVETTE - 4 dr., 4 sp., 4 cyl., economical, new steel radials, am/fm, $3,150 or best offer. 473-2473.

70 FORD - Maverick, 6 cyl., a/t, clean, dependable, new tires, battery, exhaust, etc., $700. Ext. 4921 or 929-6177.

78 TRANS AM - lo mi., 6.6 lt. eng., 4 sp., new brakes, p/s, p/b, T-top, gold ed., beige interior. Roy, Ext. 4664 or 744-8779.

78 KAWASAKI - KZ400, good cond., $900. 698-4444.

Boats & Marine Supplies

12' FIBERGLASS BOAT - 10 HP Evinrude, good trailer, $800 or best offer. Brian, Ext. 2059.

22' DEEP-V GLASS SEA SKIFF - and trailer, V6 w/75 hrs. running, lots of extras, $3,500. Charlie, Ext. 3935 or 325-0968.

SUNFISH SAILBOAT - paddle, belts, trailer, excel. cond., $750. Ext. 7654 or 286-2435.

13' SKIFF - fiberglass bottom, oars and anchor, excel. cond., $175. John, Ext. 2294.

16' ALUM. OPEN FISHERMAN'S BOAT - 40 HP Evinrude outboard, Mfg trailer, $900. 924-6751 eves.

18' GARVEY - clamming boat w/40 HP Johnson eng., both good cond., $800. John, Ext. 3292 or Jeff, 286-1348.

DIXIE - Model 172, 16' Mod. V, bow rider, navy top, 65A/hr Bett/ease; 65 HP Merc./Pow. Trim Cox Trailer/spare; power winch, extras, excel. cond., asking $4,295. 929-4522 after 5 p.m.

Yard Sales

SPRING YARD SALE - misc. items, live Easter plants, April 9-10, 39 Nottingham Dr., Middle Island, 924-9232.

GARAGE SALE - all must go. April 3-4, rain/shine, 788 E. Bartlett, Middle Island, 924-4054.

Miscellaneous

CHESS SET - plastic pieces, Florentine style, 4" king; (2) women's expanding watch bands, non-working watches incl., $5/ea. Pete, Ext. 4324.

ELECTRONIC MEDICAL THERMOMETERS - brand new, $10. Charlie, Ext. 3935 or 325-0968.

EXERCISE BICYCLE - $30; Gerry-pack baby carrier, $5; Brownie 8mm movie camera, $7; Argus 35mm, $10. Ext. 2115.

FURNITURE - contemp. liv. rm. couch, 2 chairs, 4 lamps, excel. cond. Phil, Ext. 3500 or 363-2070.

U.S. DIVERS SCUBA TANK - 80 cu. ft., K-valve, back pack, boot hydro visual 2-82, $80. 286-1074.

TUMBLING BARRELS - machine and (2) rubber lined barrels (110 volt), $150. Fred, Ext. 4407.

LEATHER MOTORCYCLE JACKET - black, sz. 42, by Schott, plenty of zippers, mint cond., $90. Ext. 3897.

COUNTRY STYLE KITCHEN FIXTURE - white frosted globe and chimney, top and bottom lights, orig. $110, asking $60. Theresa, Ext. 2907.

POOL - 24" dia., alum., good cond., w/access., you disassemble and remove. 473-1295 after 5 p.m.

TYPEWRITER - Smith Corona portable, $40. Ext. 2041.

DOWN JACKET - White Stag, women's sz. 9/10, red; new corduroy skirt, tan, sz. 7/8. Ext. 3636 or 369-2151.

FREEZER - $200; girl's 20" bike, $45. Paul, Ext. 4156.

BIKES - (2) 24" Ross convertible bikes, great for beginners, $35/$45. George, Ext. 4460.

STEREO CABINET - walnut veneer, 65" wide, 30" high, excel. cond., asking $35. 698-3856.

LANGE WOOD STOVE - end of season bargain, $100. 744-5553.

DOG CARRIER - United Airlines approved, fiberglass cargo kennel, medium to large dog, $50. 929-8662.

LIVING ROOM FURNITURE - contemp., good cond., couch, 2 chairs. Franz, 744-3235.

FISCHER "400" - stereophonic FM receiver w/two speakers, $90. Ext. 4680 or 286-1331 after 5 p.m.

ELECTRIC RANGE - Tappan Profile 400, 30" drop in, white, $50. 281-8274.

JACKET - Mouton lamb, brown, good cond., fits sizes 12-16, $75. 475-0144 after 6 p.m.

PUPPIES - Shih-Tzu, AKC registered, tiny, ready by Easter. Ext. 7727 or 929-4631.

AIR TIGHT WOOD STOVE - free standing or insert for fireplace, whole house heat output, asking $450. 399-1789 eves.

GAS ENGINE - OS 40 FSR, brand new, still in box, $60; Heath 3-channel R/C with Servos, 27 Mhz for model car or boat, $50. Steve, Ext. 4442.

55 GAL. DRUM - never used, $20. Steve, Ext. 4636.

USED TOYS - many to choose from. Helen, 281-8848.

ATARI - TV game w/1 pair joysticks, 1 pair paddles, Combat, like new. Cumming, Ext. 4347.

SKI PANTS - men's stretch, 33-34R, dk. blue, new, never worn, orig. $150, asking $85. Ext. 4727.

DEEPWELL PUMP - 1 HP, 2 stage, 110-220 volt, $95; hanging bathroom sink, cast iron, pink, faucet legs, very gd. cond., $35. 924-3565.

TRANSITE PEGBOARD PANELS - 4'x8'x", orig. cost $48 ea., selling for $18 ea. 286-1522 eves only.

BROIL MATE - Nesco, very gd., clean, $10. M. Tesla, Ext. 3284.

BARBER CHAIR - porcelain, 1940's, great conversation piece, $150; electric barber pole light, $120. Mike, 669-9482.

PIANO - Yamaha, studio upright, excel. cond. Ext. 3917 or 727-2876 after 6 p.m.

SMALL DREMEL - good shape; men's lrg. wet suit, ¼", new $90, best offer over $50; lrg. Godin coal stove, new $1,095 without inside & outside pipe, $800 firm incl. pipe & base. Carol. 289-3917.

DECORATIVE CEILING BEAMS - (4), solid wood, 4"x5"x12', stained dark walnut, $40. 698-4444.

LAWNSWEEPER - 31" trailer, excel. cond., compl. w/parts list and manual, asking $45. 744-3218.

WHITE RABBIT - just in time for Easter, healthy adult male, best offer. Ext. 3578 or 878-4864.

FIREPLACE AIR TUBES - $10. John, Ext. 3675.

OMEGA ENLARGER - color head, 35 or 2x3, 4 film & 2 lens carriers, new cond., $210. Ext. 4058 or 286-0436.

EMERSON STEREO - & speakers, excel. cond., still in orig pkg., asking $175. Ext. 4303.

PHONO CARTRIDGE - audio/video Stanton 681 EE, $15; Scotch Beta Video head cleaner, $10. Peter, Ext. 4272.

STOVE COMFORTER - cast iron, can be used for wood or coal. Ext. 2557 or 475-0509 after 5:30 p.m.

CHAIR W/OTTOMAN - high back, tufted, Mediterranean style, cranberry color, excel. cond., $60. 744-2404.

LIVING RM. FURN. - couch & matching loveseat, sacrifice. 265-0501 after 7 p.m.

Real Estate

Real Estate advertised for sale or rent is available without regard for the race, color, creed or national origin of the applicant.

For Sale

DELAWARE COUNTY - 4 rm cottage, wooded area, 3 hrs. from NYC, stream, 8'x38' deck. 744-4087.

RIDGE - 3 bdrm., eik, formal d/r, fireplace, Cul-de-Sac, assumable mort. 8%, $62,500. 929-8781.

N. PATCHOGUE - high ranch, l/r, d/r, kitchen, 3 bdrms., 1 baths, lrg. paneled family rm., garage, util. rm., prime area, walk to schools, assumable 6% mort., low taxes, $39,000. Owner, 929-6984.

POCONOS - vacation campsite with e/w/s, 1 hr. from NYC, lake, pool, clubhouse, price negotiable, will hold mort. Owner, 928-0066.

For Rent

SOUTHAMPTON - new 3 bdrm high ranch w/fireplace, sun deck, wood/coal stoves, R38/R19 insulated, 3 min. to beaches and golf, 35 min. to BNL. Yearly $575/mo., summer $6,000. Ext. 2070 or 283-0223.

BERKSHIRES CHALET - 3 hrs. from NYC, 3 bdrms, 2 baths, fully equipped kitchen, elec. heat, deck w/spectacular view, near lake, hiking trails. Available weekly or weekends. 929-6946 after 6 p.m.

FURNISHED ROOM - share bath, kitchen, l/r, $200/mo. incl. util. Roy, Ext. 4664 or 744-8779.

Wanted

MOTORCYCLES - bent or broken, any age or cond. Kevin, 281-8031.

TWO MALE DUCKS - 581-7656.

HOUSE TO RENT - professional family with 2 infants; 3 bdrms, furn. or unfurn., occupancy 5/1/82. Ext. 7114.

VETERANS - to join D.A.V. chapter. Don Devlin, 736-3405.

BOLEY WIRE CHUCKS - (3) jaw chuck, (4) jaw chuck, bezel chuck, slide tool compound. Hrabak, Ext. 3536.

APARTMENT - two profess. women need 2 bdrm apt., Port Jefferson Village area. Joy, 265-4347.

LEAF RAKER - strong, willing, energetic, for weekends. Ext. 3838.

CAMPING EQUIPMENT - 369-2151 eves.

LAWN SPREADER - Scotts preferred, reasonable, good cond. 744-9311 eves.

WRECKS - any wrecks, junk, parts for 67-73 Camaro, anything, we take wrecks. Ken, Ext. 5385.

G.M. LOVE SEAT - for child over 15 lbs., reasonable price. Ken, Ext. 5385.

HOUSEMATE - 2 b/r condo, Holtsville, 5 appl., $225 incl. all util. Female please. Ext. 3199 or 475-6622 eves.

ELECTRONIC ENGINEERS MASTER CATALOGS - Vols. 1&2, 1980 and later. Peter, Ext. 4662.

SEWING MACHINE - Singer, good cond., reasonable price. 924-0581.

TIRES - G78-14, up to $20; camping items, heater, chairs, table. Ext. 4321 or 3078 after 6 p.m.

POLICEMAN'S HAT - old style for Hello Dolly. Glenn, Ext. 3336.

PERSONAL COMPUTER - call with details. John, Ext. 3292 or 286-1348.

USED LUMBER - 2x4, 2x8, 2x10, sheathing. Howard, Ext. 2000.

TO RENT - 1 or 2 bdrm. house or apt., reasonable. 399-0864 after 5 p.m.

Services

Services are listed as a courtesy to BNL employees. They are neither screened nor recommended by the ***Bulletin.***

ROTOTILLING - for gardens, lawns, any size, $15/hr. Dave, Ext. 4289 or 288-3011.

HOUSE PAINTING - int./ext., profess., quality materials, insured. Bob, 289-7657 after 6 p.m.

PLUMBING AND HEATING - Lab discount. John, 654-8189.

SPRING CLEANUP - ambitious, strong, 11 yr. old desires yard work, car washing, garage cleaning. Peter, 821-9547.

ATTENTION MOTHERS - in Shoreham/Wading River/Rocky Point, responsible, loving, 13 yr. old desires babysitting/mother's helper position during summer months. Nancy, 821-9547.

HOUSE SITTING - free, caring, experienced, any period after May 28, plan your vacation now. Allentuck, Ext. 2412.

TYPING SERVICES - 744-4047.

BUS TRIP - NYC, visit private Rodin collection atop World Trade Center, Stock Exchange, Wall Street, April 14, $18.50. 286-4500.

FIRESIDE CHIMNEY SWEEPS - spring cleaning special, fireplaces, stoves and oil flues, hand swept and vacuumed. Bill, 584-6425.

INCOME TAX - prepared by professional accountant, very reasonable rates. Bob, 286-5829 eves. and weekends.

ASPHALT PAVING AND SEALING - Bob, 475-4382.

RESUMES - prepared, typed, printed, cover letters. Bill Polvent, 821-9081.

TAXES - prepared by tax consultant, your home or mine, reasonable. John, 732-2472.

AUTOMOTIVE REPAIRS - and tune-ups. Glenn, 281-7873.

HOUSECLEANING - serve at parties, babysit, local, mature woman and/or man, reliable, references. 924-3755.

FIRE ALARMS - burglar, all types. Call today for free survey. Custom System, 399-3806.

CONSUMER REPORTS - subscription group has opening, special rate, $10.50/yr. Alyce, Ext. 2902.

TILE & CEMENT WORK - reasonable rates, good work. John, Ext. 3292 or Donald, 281-8848.

CAR CARRIER - and driver for hire. Any kind of car transported safely. Ed, Ext. 4095.

LIMO SERVICE - luxury, chauffer driven Cadillac, proms, weddings, airport, all occasions. Roy, Ext. 4664 or 744-8779.

SMALL APPLIANCE REPAIRS - vacuums, heaters, all small appliances, No. Patchogue. 654-3900.

PROF. INCOME TAX SERVICE - by exper. preparer, year-round service, on-site preparation. Jack, Ext. 7942.

TUNE-UP FOR SPRING - lawnmower repairs. Joe, 475-8440.

CARPETS INSTALLED - repaired, quick, dependable service, free estimates. Jim, 821-0187 after 5 p.m.

LANDSCAPING - light auto. repairs, cheapest rates possible. 289-9811.

TILE SETTERS - ceramic quarry tiles, no job too small, free estimates. E. Harris, 475-6460.

GARDENS - plowed or rototilled. 727-0082 after 6 p.m.

HOUSECLEANING - and/or babysitting, house flex., exper., can provide refs. Cathi, 281-0360.

TREE SERVICE - pruning, trimming removal; yard, cellars, garage clean-ups. 727-1617.

HOUSE SITTING - free, any period after April 12, exper., caring, plan vacation now. J. Allentuck, Ext. 2412.

Classified Ad Policy

Deadline is 4:30 p.m. Friday for publication Friday of the following week.

1. The Brookhaven Bulletin's classified section may be used only by active and retired Laboratory employees.
2. All items for sale or rent must be the advertiser's propert
3. A aterial acquired for resale in association with a full t time business cannot be accepted.
4. Ads the sale or trade of firearms will not be accepted.
5. Ads not carried because of space restrictions will be held for publication in the next issue.
6. Ads are run only once and must be resubmitted if they are to be repeated. One ad per person per week.
7. **Property for sale or rent cannot be accepted on this form. Special Real Estate Ad Forms are available at the office of the Brookhaven Bulletin, Building 134.**

☐ For Sale: Autos & Auto Supplies ☐ For Sale: Boats & Marine Supplies ☐ For Sale: Miscellaneous ☐ Car Pools ☐ Lost & Found ☐ Services ☐ Wanted ☐ Free

Please print your ad below in 15 words or less using one word per block. Include name and phone number to call.

Note: The following must be completed for your ad to appear.

NAME (Please Print) .....

Employee's Signature ..... Life No. ..... Ext. .....

Send to: Brookhaven Bulletin, Building 134 (Ext. 2345).

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