

The Latest on Polarized Protons

Another chorus of cheers went around the Accelerator Department this week when polarized protons were accelerated into the AGS main ring. This achievement followed last week's acceleration of polarized H^- ions from the radio frequency quadrupole accelerator (RFQ) into the AGS Linac.

On Wednesday at 7 p.m., a beam of polarized protons was accelerated to 4 GeV, at 53% polarization. It was another step toward providing polarized protons for the spin physics experiments scheduled later this year on the AGS.

Last week, when a 1.5 microampere beam of polarized H^- ions was accelerated through the Linac, the beam

from the source, through the RFQ and on through the Linac, "When the RFQ injected into the Linac last week, it became the first RFQ in the world to be coupled to an operating accelerator." The polarized H^- ions were then injected into the AGS, where they were stripped of electrons to become polarized protons, and then accelerated for only a few milliseconds, not long enough to measure polarization.

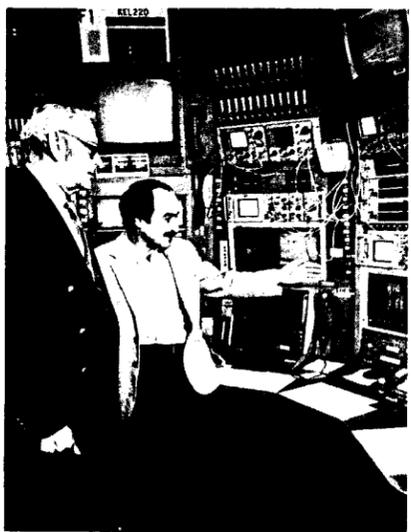
Because the RFQ proved to be so well-matched to the Linac, the way was paved for this week's successful beam acceleration into the AGS. Repeated efforts will be made over the next month to fine-tune all parts of the system to increase beam intensity and polarization.

For Makdisi, that means optimizing the intensity of the polarized H^- ions as they journey from the ion source all the way to the AGS.

Once the beam is inside the AGS, the biggest challenge will be to keep it polarized as it gains energy circulating around the ring, according to Larry Ratner, who is in charge of the AGS end of the operation. The project's goal is to accelerate polarized protons to 26 GeV. Ratner says that even above 12.75 GeV, completely new spin physics will be possible. This was the highest energy of a polarized beam achieved to date from the decommissioned ZGS accelerator at Argonne Lab.

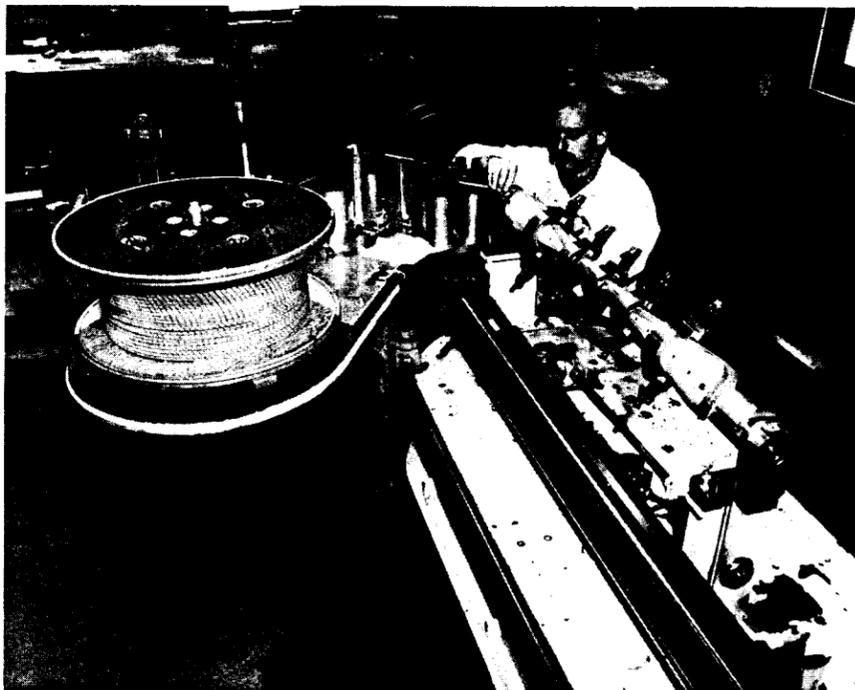
Both Ratner and Makdisi are members of experimental teams scheduled to do spin physics experiments with the AGS polarized beam this summer. As Makdisi says, "We are eager to get the polarized beam going so we can do these exciting experiments."

What they and others will be aiming for is a polarized proton beam at 26 GeV, with more than 50% polarization. This will allow precise measurements of spin effects in the totally unexplored region above 13 GeV.



In the AGS control room are Larry Ratner (left) and Yousef Makdisi, two of the people involved in the project to accelerate polarized protons in the AGS.

was measured at 65-70% polarization by Jabus Roberts and his colleagues from Rice University, using the proton-carbon scattering polarimeter built there. According to BNL's Yousef Makdisi, who has been in charge of the effort to get polarized H^- ions



A view of the coils designed by the Magnet Division for high field superconducting magnets for the SSC. Note the "dogbone" shape of the coil. Its flared ends reduce the strain on the delicate niobium tin superconductor.

BNL Developing A Super Magnet

Standing on end, it will be about as high as a five-story building. Lying horizontally, it could almost form a bridge between the bases on a softball field. But the object under development by the Magnet Division of High Energy Facilities will be neither building nor bridge. It will be a 50-foot long superconducting magnet. And perhaps it will be one of the 3600 magnets through which protons would pass on their journey around a Superconducting Super Collider (SSC) 70 kilometers in circumference.

First proposed by the High Energy Physics Advisory Panel last June, the SSC is now in the early stages of development, with three possible ring sizes and magnet field levels (low, 2-3 Tesla; intermediate, about 5 T; high, to 8 T), under consideration at different laboratories. One of these levels and ring sizes will be chosen for the reference design to be used by Energy Secretary Donald Hodel in deciding whether or not the Department of Energy should ask Congress for R&D funding for the SSC for fiscal year 1985. At BNL, efforts are concentrated on developing high field superconducting magnets for an SSC with a 70 kilometer circumference.

In proposing the SSC, HEPAP also recommended that the Colliding Beam Accelerator (CBA) be terminated. So the Magnet Division shifted gears. With its experience in developing superconducting magnets for the CBA, the division was in an excellent position to begin work right away on high field magnets for both the SSC and RHIC, the relativistic heavy ion collider BNL has proposed to occupy the completed CBA tunnel. The transition has been as smooth as synchro-mesh. For, just as each higher gear in a stickshift adds upon the speed built up by a lower gear, the magnets needed for the new generation accelerators use the CBA magnet work as a starting point.

Lawrence Berkeley Laboratory (LBL) leads one high field SSC magnet effort taking place at BNL. Planned to reach fields about 6.5 T, this magnet will use a new version of the niobium titanium conductor developed for the CBA magnets, and the same iron yoke. The LBL team, led by Clyde Taylor, will use BNL's manufacturing capabilities since, in California, they can only construct models up to

one meter in length. And BNL is also assisting LBL with some calculations.

BNL people are focusing on an 8 T magnet design which draws upon work previously done at BNL in refrigeration, vacuum and measurement techniques (see box). Though the final configuration will not be settled until about March, the ideas under consideration all call for a 2-in-1 design, similar to one originally considered for the CBA magnets. The first three magnets demonstrating the concept will be 15-footers, built and tested in the facilities created for the CBA magnets. And the very first of the three, planned for completion by late June, will use the same niobium titanium cable for a superconductor, in time for Secretary Hodel to have an accurate working model on which to base his decision. The second demonstration magnet will be ready by August and the third will be finished by September.

For the third magnet, the niobium titanium cable will have been replaced with a superconductor made of niobium tin, now being developed in cooperation with industry. After commercial manufacture, the niobium tin will be woven into a multi-stranded, slightly trapezoidal cable, either by industry or at BNL, by using a newly-modified cable winding machine borrowed from the Power Transmission Project.

The idea of using niobium tin was first proposed by Associate Director Bob Palmer. "This will be a major advance in superconducting technology if it works out, because the niobium tin is capable of much higher currents than niobium titanium," said Erich Willen, the Deputy Division Head in charge of physics aspects for the Magnet Division, headed by Ralph Shutt.

But niobium tin also has its drawbacks. Once it is heat-treated to become superconducting, it also becomes very brittle and can crack easily when wound tightly. In the new magnet design, this problem is compounded by a tiny aperture, the opening through which the proton beam passes under vacuum. The bore was reduced to about 3.2 cm, as opposed to 13.2 cm for the CBA design. Said physicist Per Dahl, "The cost of the magnet is strongly dependent on the size of the

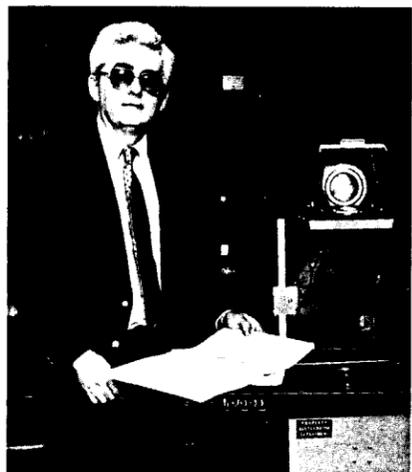
Task Force Recommends AGS II

A few months ago, the Laboratory asked users of the AGS to give their thinking on the important physics which could be pursued at this accelerator, and what should be done to the machine to make such a program successful. Their recommendations were to be given both for the near and the long term.

So the High Energy Discussion Group (HEDG) appointed a 41-member AGS II Task Force to carry out the charge. Last week, their deliberations were summarized for BNL staff by Task Force chairman Gerald A. Smith (Penn State).

In brief, the Task Force concluded that considerable forefront physics is still obtainable from the venerable AGS, given suitable modifications and additions. As emphasized by Smith, what should be done to improve the AGS was determined by the areas of physics the Task Force considered most important and achievable only at this accelerator. In fact, the report concludes that "failure to follow through on these recommendations would create a major void in the field of experimental particle physics, a void which no other existing machine is capable of filling." The Task Force did not concern itself with a heavy ion physics program at the Laboratory as this has been addressed elsewhere.

Among the new areas of physics which could be explored at the AGS, the Task Force highlighted the following:



Gerald A. Smith, chairman of the AGS II Task Force, prepares to address the staff at the Snyder Seminar room.

- Rare kaon decays — the report notes that "if $K \rightarrow \mu e$ or $K \rightarrow \pi \mu e$ were detected, this would be a discovery of great importance, comparable, for example, to a discovery of nucleon decay. If $K^+ \rightarrow \pi^+ +$ (undetected particles) did not occur at a rate equal to its standard model prediction, it would be a major breakthrough."
- Research in neutrino interactions and oscillations and muon physics.
- Intense hadron and polarized proton beams for detailed studies of QCD.
- Unique intermediate energy kaon beams to explore the structure of exotic atoms, dibaryons and hypernuclei.

(Continued on page 2)

Kilo Alpha 2 Golf Alpha Tango

Joe Mazzarella, Supply & Materiel, picked up a postcard with an aerial view of the Lab to send to an acquaintance he had conversed with over an amateur radio frequency. He had tried to describe the change the site had undergone from having been Camp Upton to being the Brookhaven National Laboratory. Mazzarella thought that a picture of the site would be valued by the Army veteran who had been stationed at Camp Upton for five months during World War II. As an amateur radio operator, Mazzarella bridged a gap in time and distance for this Camp Upton veteran who now lives in Santa Barbara, California.

One night while operating his Heath Kit 101 transmitter and receiver, Mazzarella, known over the air as Kilo Alpha 2 Golf Alpha Tango, was having a "QSO," or conversation, with a man who asked his "QTH," or location.

"Long Island," said Mazzarella.

"What part of Long Island," asked the man.

"Shirley."

"Where is that?"

"Ten miles south of Port Jefferson."

"I know where that is," the man said, "During the war I was stationed at Camp Upton for five months."

"Well, I live about three miles from the site."

"Tell me, what happened to Camp Upton?"

Mazzarella told the former soldier that it had become a scientific research center, renamed the Brookhaven National Laboratory, and that he worked there. When the man discovered the further coincidence that Mazzarella then worked in Building T90, a former mess hall where the man had worked for three months,

"he was so overwhelmed with old memories and emotions that he signed off the air," says Mazzarella. "He later wrote me a letter in which he invited me and my family to visit with him in California."

Mazzarella, who holds a general class license and is preparing for the advanced licensing exam, has been an amateur radio operator for two years. "On the first evening of amateur radio classes in which one of my sons was enrolled, I sat outside the class reading the newspaper. An elderly man asked me what I was doing, and why wasn't I in the class. So I went, and I got my novice license, I am now ahead of my son in the licensing classifications because Jim switched to girls while I stayed with the radio."

After receiving his general license, which allows an amateur operator to talk over the air as well as use Morse code, Mazzarella began a QSO in Italian with a man who turned out to be his long-time best friend Gino from Taranto, Italy, Mazzarella's home town. Since he speaks Spanish in addition to English and Italian, Mazzarella is able to communicate with many people from around the world, as well as across the United States, and is proud of the over 1,000 "QSL" postcards he has received from his amateur radio contacts. "The thrill of ham radio is talking to distant countries, and keeping up with your friends," explains Mazzarella. "The challenge is to contact people farther and farther away. The more skills you have in the various techniques of amateur radio operation, the more luck you have in contacting people far away."

—Marsha Belford

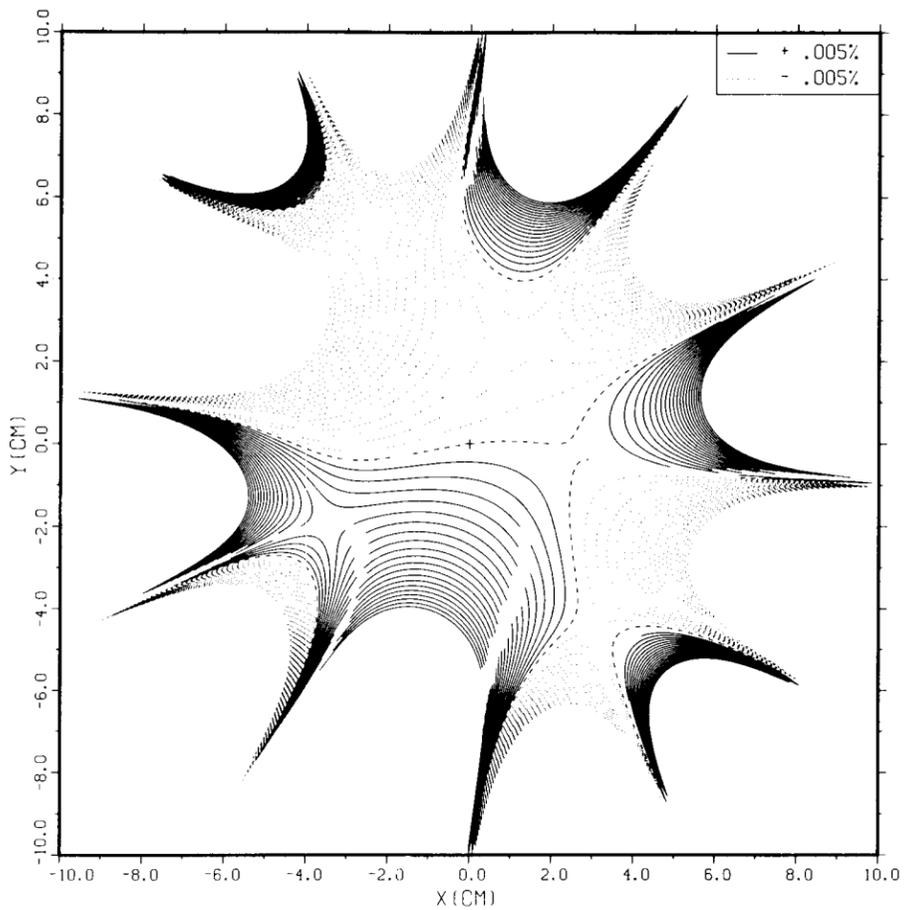
When Joe Mazzarella and his son have made contact with other radio amateurs, they send them this QSL postcard. On the back of the card, Mazzarella notes the date of the conversation, the Greenwich Mean Time, the frequency, the signal strength, whether Morse Code or spoken words were used, and the type of equipment. He ends his remarks with the hope that he will "catch you down the log."

Joe and Jim Mazzarella
49 Forest Ave. Shirley, N.Y. 11967

□ JOE **K A 2 G A T**

□ JIM **K A 2 G A U**

United States of America



This computer graphic was devised by Magnet Division computer analyst Richard Hogue to provide a possible presentation for field quality analysis of superconducting magnets. By calculating contours from measured coefficients for a particular magnet, Hogue's program can provide images depicting the deviation of the magnetic field, with each contour representing how much a particular part of the field differs from the field at the magnet center. This graphic illustrates the vertical field deviations within a prototype dipole superconducting magnet. The + sign indicates the magnet's center, and the type of line defining each contour shows the percent of change from the center's field; a dashed line (---) = 0% deviation; a solid line (—) = a positive 0.005% deviation; a dotted line (...) = a negative 0.005% deviation.

Super Magnet

(Continued)

aperture, because smaller bores require less superconductor." Paradoxically, however, the small diameter also places a considerable strain on the superconductor when it is wound, in a coil that fits snugly around the aperture. So learning how to wind tight coils with this delicate conductor has been a Magnet Division priority. To solve this problem, division engineers have come up with a unique "dog-bone" design for the superconducting coils, which flares out at the ends.

Smaller bores also mean less room. The superinsulation that fit nicely around the walls of the warm vacuum chamber in the CBA design cannot be crammed into the new magnet's bore. So the new design will have a cold

bore for, as Dahl said, "The worries that kept us with warm vacuum seem no longer pertinent."

Others in the Magnet Division are concentrating on tooling. While the present fixtures and machines will be useful in helping teams from both BNL and LBL build 15-foot demonstration magnets, having a 50-foot prototype ready by the beginning of 1985 will require a whole new set of facilities where a magnet weighing about ten tons can be built and tested. The focus right now is on design of these facilities so that if Secretary Hodel gives the nod to SSC and to BNL's magnet, construction of additional R&D magnets can proceed.

— Anita Cohen

PC User Group To Be Formed

A workstation can be defined as a collection of equipment and tools that enables people to use some computer resources to assist them in their work. Because the use of personal computers as workstations is becoming increasingly popular, a PC/Workstation User Group is being formed.

The first meeting will be held on Tuesday, March 6 at 10:30 a.m. in the Physics Seminar Room. This meeting will be largely organizational, but subsequent ones will feature a presentation on a particular topic followed by a discussion.

Those who are now using or plan to use a PC in their work, are invited to attend, or to communicate with Kurt Fuchel, Ext. 4116, who will function as chairman of the group until an election can be held.

Note that this group does not replace the Microcomputer Club (whose chairman is James Hainfeld, Ext. 3372) which concerns itself more with computers used at home.

Task Force

(Cont'd)

To insure such a program at the AGS during the next 10-15 years, hardware upgrades and dedicated machine R&D would be necessary, and the total price tag is estimated at \$114 million. Included in this figure would be a slow spill stretcher ring; beam line and detector upgrades; increased repetition rate; 10 Hz, 2.5 GV booster; and AGS upgrades needed for high intensity.

Operating reliability and beam intensity led the list of machine goals. In the near term (up to five years), the Task Force estimates improvements to cost \$46 million out of the total estimate of \$114 million, with an increase in intensity from 1.5 to 3×10^{13} protons per pulse. In the long term (over five years) further improvements would allow the AGS to deliver 10^{14} protons per second.

The 254-page report has been presented to Laboratory management who will study it in detail. The possibility of the AGS moving on to become AGS II will be discussed further in conjunction with a HEDG meeting at the end of March.

Taking a Magnet's Measure

"There's a mole in my magnet."

Soon, statements like that won't seem very peculiar at High Energy Facilities' Magnet Division. Moles will be put inside the new superconducting SSC magnets as a matter of routine. But as they burrow through the small bores, they won't be looking for insects on which to feed. They'll be checking out the magnet's quality.

Moles are the Magnet Test Section's answer to a problem posed by the same small aperture that will function as the moles' primary environment. Headed by Peter Wanderer, the section's main task is to figure out ways of assessing a magnet's field quality. So they have come up with the mole, a self-contained rotating coil which can be pulled through a magnet, stopping every foot or so to measure the characteristics of the field as it moves along.

For the CBA magnets, the section had devised tangential measuring coils, but that design won't work in the new magnets. Not only is it too large to fit inside the small bore, but it won't work over the long distances — 50 feet — of the final magnet design.

"Essentially, the mole is based on techniques we have developed for measuring magnets with tangential coils. But this is a real exercise in miniaturization," said Erich Willen about the three-foot long mole, which was designed largely by engineer John Skaritka. "Still, it's not trivial because we will be in a very high magnetic field with this thing, which means you must be careful of the materials you use and, in some cases, modify things that have been made with metal parts." Considering the technical feasibility of this measurement technique is the responsibility of physicist John Herrera.

Willen is enthusiastic about the mole's potential. "This is the kind of device that also lends itself to future development," he said. "For example, it could be self-propelled, so it can simply continue by itself through the whole ring of magnets." Self-propulsion presents difficulties since electric motors can't be used in the high magnetic fields. Also of concern is where and how to hide the mole when the accelerator is running, so it doesn't block the beam.

But these are problems for the next generation of moles. The granddaddy of them all is now being fabricated in a shop in the Physics Department where it is expected to be completed in about six months, in plenty of time to test the first 50-foot SSC magnet.

— A.C.

BROOKHAVEN BULLETIN

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BERNICE PETERSEN, Editor
MONA S. ROWE, Assistant Editor
ANITA COHEN, Reporter
MARSHA BELFORD, Reporter

35 BROOKHAVEN AVE., UPTON, N.Y. 11973
Telephone (516)282-2345

WIS Dinner Meeting

The next dinner meeting of the BNL Women in Science will take place on Wednesday, March 14, starting at 5:15 p.m. in the NSLS conference room. Jane Setlow, Senior Geneticist, Biology Department, will speak on "The Impact of Genetic Engineering on Modern Life."

Jane Setlow did her undergraduate work at Swarthmore College where she met and married Richard Setlow (now chairman of BNL's Biology Department). She then stopped her studies to raise a family. After her children were in school, she went to graduate school and obtained a Ph.D. in biophysics from Yale University in 1959. Thereafter, the Setlows worked at Oak Ridge National Laboratory and in 1974 they came to BNL.

For six years Jane Setlow was active on the National Institutes of Health Recombinant DNA Molecule Advisory Committee, and served as chairperson from 1978-80. Her efforts were directed toward the relaxation of guidelines for research in recombinant DNA molecules. She is now doing research on the recombination and repair of U.V. damage in bacteria.

Reservations can be made by sending a check for \$6.75, payable to BNL-WIS, to Nancy Fallon, Bldg. 535A, before March 9, or by calling her at Ext. 4530.

Tell Us A Story

We are looking for hot tips and informed sources for Brookhaven Bulletin stories and features. If you are making news, or have some information about a special event or person at the Lab, please let us know by calling extension 2345, or by mailing us a note at Building 134.

On Safety Shoes & Glasses

The Laboratory's safety shoes and safety glasses are under contract with outside vendors. Glasses can be ordered on Wednesdays from 9 a.m. to 4:30 p.m.; shoes on Mondays from 1:30 p.m. to 4:30 p.m. and Thursdays from 9 a.m. until noon.

The vendors are located in Bldg. T-88, 14 S. Railroad Street and will answer questions regarding status and availability, during the above hours, on Ext. 2864. Do not call Supply & Materiel for this information as all records are maintained by the vendors.

Normally, orders take about two weeks to be delivered and you will be called by the vendor when yours is received. Should you encounter any unusual difficulties, call Ext. 5200.

Bumper Stickers

Safeguards and Emergency Services will not honor 1983 bumper stickers after March 16. So don't get caught out. Apply for your 1984 sticker now.



The Herrick Quartet will perform at Berkner Hall on Friday, March 9, at 8:30 p.m. On the program is Haydn's "Quinten" Quartet in D Minor, Op. 76, No. 2; Beethoven's Trio in C Minor, Op. 9, No. 3; Three Preludes on Welsh Hymn Tunes, a quartet by Vaughn Williams; and Mozart's Quartet in A Major, K. 298. Tickets will be available at the door. General admission is \$7; students and senior citizens, \$3; and those under 18, \$3.

Tax Tip

If you have a bank loan and are completing your income tax, you will want to know how much interest you paid in 1983. To get this information, drop by the on-site bank, or call them, as they have interest statements already prepared for each account.

Interest paid on Credit Union loans for 1983 was included on December statements. If you have mislaid your statement, the local office will be glad to get the amount for you.

Hospitality News

Adrienne Usher will demonstrate Russian punchneedle embroidery at the Hospitality Committee's next morning get-together on Tuesday, March 6, from 9:30 to 11:30 a.m. at the Brookhaven Center.

Wives of Lab employees, guests, and visitors are welcome. Coffee, tea and danish will be served. Please come and bring the children. Babysitting will be provided free of charge.

Volleyball

Standings as of 2/27/84

Mixed League	
A Division	
Dinkers	15-3
Teddybears	15-3
EPO's	9-9
Semi Tough	9-9
Up Fagrabs	11-7
Mixed Ups	6-12
Nuts and Bolts	3-15
TNT	4-14
B Division	
Photobars	15-3
Servers	13-5
Bottoms Up	14-4
Chungas Revenge	12-6
Excitons	5-13
Screwballs	7-11
CRAW	3-15
Quirks	3-15
Open League	
As of 2/15/84	
Phoenix	48-0
Rowdy Radicals	34-14
Half Lives	18-30
Mana	11-37
Generic	9-39

Stony Brook Events

- Mar. 5 6-10 p.m. Free instrumental jazz workshops for Suffolk County high school and college students. Int. Art of Jazz. Music Wing, Fine Arts Center. Info 246-6126.
- Mar. 6 7 & 9 p.m. Film "Ivan the Terrible" Stony Brook Union Auditorium Fee \$1.
- Mar. 6 8 p.m. Lecture: "Scandinavian Perceptions of the Soviet Union and National Security," Per Alin, Prof., Dept. of History. Arms Control, Disarmament, and Peace Studies Resource Center, Old. Chem. Bldg.
- Mar. 8 8 p.m. Concert. Chamber Symphony Orchestra and Opera, Main Stage, Fine Arts Center. Tickets \$5.

Cafeteria Menu

Week Ending March 9

Monday, March 5	
Beef barley soup	(cup) .65
	(bowl) .85
Turkey a la king on white rice	1.90
Kielbasi & kraut	1.90
Hot Deli - Veal patty	
Parmesan	(bread) 1.95
	(roll) 2.10
Tuesday, March 6	
Cream of chunky vegetable	(cup) .65
	(bowl) .85
Southern fried chicken w/1 veg. & cranberry sauce	1.90
Beef and broccoli stir fry on rice pilau	2.00
Hot Deli - Grilled Reuben	1.90
Wednesday, March 7	
Split pea soup	(cup) .65
	(bowl) .85
Sauerbraten w/potato pancake & red cabbage	2.20
Meatless eggplant Parmesan w/1 veg. & garlic bread	1.95
Hot Deli - Turkey breast	(bread) 1.95
	(roll) 2.10
Thursday, March 8	
Turkey noodle soup	(cup) .65
	(bowl) .85
Breaded chicken cutlet w/stuffing	2.10
Veal ragout on egg noodles	2.00
Hot Deli - Top round of beef	(bread) 1.95
	(roll) 2.10
Friday, March 9	
Boston clam chowder	(cup) .65
	(bowl) .85
Batter dipped fish w/French fries	1.85
Roast fresh ham & 1 veg.	1.95
Hot Deli - BBQ meatloaf	(bread) 1.90
	(roll) 2.05

Fiesta! Baile! Salsa!



The Hispanic-American Society is holding open house, to which all employees are invited, on Friday, March 2, from 5:15 p.m. to 10 p.m. at the Recreation Building. On the program will be delicious Spanish dishes, dancing to a DJ, and a cash bar offering beer, wine and soda. There is no admission charge. For more information, call Jose Medina, Ext. 7636, Jose Sanchez, Ext. 7765, or Lucy Sanchez, Ext. 4399.

Arrivals & Departures

Arrivals

James J. McManus App. Math

Departures

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

Willie H. Campbell S&M
Thomas C. Esnes Plant Engrg.
Kenneth J. Voska DNE
Joseph H. Whelan Plant Engrg.

Basketball

Boxscores - 2/23/84

Game 1

Hollywood - 103	Coasters - 68
B. Woodson 12	E. Taylor 6
R. Schuman 2	B. Doty 17
L. Walcott 26	L. Smith 16
L. Lawrence 2	M. Fulkeson 10
E. Meier 18	M. Williams 13
G. Mack 18	B. Jasper 4
B. Kowaski 2	L. Snead 2
D. Nostron 23	

Game 2

Long Shots - 74	Runaway - 80
J. Gaffney 21	T. Mooney 4
B. Johnson 10	S. Woodson 2
L. James 29	J. Shepherd 6
R. Church 2	G. Smith 6
J. Garrison 11	P. Johnson 34
B. Danowski 1	T. James 26
	J. Lehmann 2

Team Standings

Hollywood	5-0
Longshots	3-2
Coasters	1-4
Runaways	1-4

Bowling

Applications are still available at the BERA Sales Office for the Scotch Doubles on March 4 at 2 p.m. at Port Jeff Bowl.

Red/Green League

H. Marshall rolled a 236, L. Jacobson 223, J. Medaris 206, H. Arnesen 205, T. Holmquist 205, C. Bohnenblusch 204.

Purple League

High games for two weeks were bowled by E. Meier 202, J. Roesler 213, D. Adams 201/200, J. Ferrante 208, B. Belligan 213/226, M. Connolly 218, J. Petro 209/229, K. Asselta 246, K. Vogel 190.

White League

R. Sheehan had a 226, M-G Meier 221, P. Manzella 188, J. Pinelli 187, P. Lebitski 181, E. Meier 219, B. Glasmann 198, B. Jacobs 196.

Drivers Note

If you rent cars for official or personal use and don't recognize this card, you are missing out. Check with the Travel Office for more information.

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Classified Advertisements

Placement Notices

The Laboratory's placement policy is to select the best-qualified candidate for an available position, with consideration given to candidates in the following order of priority: (1) present employees within the department, with preference to those within the immediate work group; (2) present employees within the Laboratory as a whole; and (3) outside applicants. In keeping with the Affirmative Action plan, selection decisions are made without regard to age, race, color, religion, national origin, sex, handicap or veteran status.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all non-scientific staff positions; second, to give employees an opportunity to request consideration for themselves through Personnel; and, finally, for general recruiting purposes. Because of the priority preference policy stated above, each listing does not necessarily represent an opportunity for all candidates. As a guide to readers, the listings are grouped according to the anticipated area of recruitment.

Except when operational needs require otherwise, positions will remain open for one week following publication date.

For further information regarding a placement listing, contact the Personnel Placement Supervisor, Ext. 2882.

LABORATORY RECRUITMENT: Opportunities for Laboratory employees.

2024. BIOLOGY ASSOCIATE - Requires BS in biology, biochemistry or chemistry including a minimum of one year biochemistry course work. Individual will purify and assay enzymes; prepare and characterize DNA. Biology Department.

OPEN RECRUITMENT: Opportunities for Laboratory employees and outside applicants.

2025. PROJECT ENGINEER - Requires BSME or equivalent with at least 5 years of experience related to design and construction of residential buildings with greatly reduced need for energy heating or cooling. Experience with building performance monitoring required. Analytical and creative ability are also required to enable the successful candidate to participate in the optimization of building systems. Department of Applied Science.

Autos & Auto Supplies

GERMAN AUTO PARTS - wholesale prices on new parts for VW, Porsche, Audi, BMW, and MB. Augie, 289-4211.

80 TOYOTA 4 x 4 P.U. - 55,000 mi., extras, excel., \$7,400. Mark, Ext. 4031 or 878-8255 eves.

66 CHEVY MALIBU - 4 dr., run, \$75; tires, 2 x 6.95/14, 1 x 7.35/14, 1 x 7.00/13 on rim, \$5/ea. Rich, Ext. 2965 or 744-0960.

71 CHRYSLER NEWPORT - runs fine, new tires, best offer. Ext. 4363 or 924-7238 or 286-1183.

75 HONDA 500CC TWIN - good cond., low mi., \$700. Irene, 589-5126.

74 JEEP CJ5 - 304 eng., many new parts, looks and runs great, \$3,400 or best offer. 234-9630.

76 COUGAR XR7 - am/fm radio, a/t, p/s, p/b, a/c, lt. blue, good cond. Joan, Ext. 2446 or 727-2930 eves.

72 DUSTER - 6 cyl., 3 spd., engine, clutch, needs work, am/radio, drive it away, \$400. Bill, 246-7110 days.

68 VW CAMPER - sleeps 3-4, sink, icebox, runs, needs some work. Wanda, Ext. 3583 or 3692.

78 BUICK REGAL - a/c, a/t, new w/w tires, wire wheels w/l, am/fm stereo, excel. cond., small V-6 engine. 588-7989.

GOODYEAR TIRES - (4) Polysteel w/w (3) P195/75-14, (1) P205/75-15, good spares, \$5/ea. Ext. 2492.

78 HONDA 550 - 4 cyl., 5 spd., low mi., excel. cond., \$895. Ext. 4309.

81 FORD F250 3/4 TON P.U. - auto. w/overdrive, p/s, p/b, 30,000 mi., excel., \$6,000. Slim, Ext. 3084.

76 DATSUN B210 - 4 spd., radials, am/fm cassette stereo, sports pkg., excel. in/out, \$1,675. 586-2353.

CHROME ROLL BAR - w/5 KC lights for Ford P.U., \$150. Ext. 3499 or 589-9103.

77 CADILLAC COUP DEVILLE - 2 dr., excel. cond. 473-6432.

67 VOLVO - runs, many new parts, needs little work, \$250. Rose, 744-5069.

76 CHEVY MALIBU CLASSIC - small V8, a/c, p/s, p/b, new all weather radials, clean in & out, runs well. Ext. 2926/eves. or 744-3298/days or weekends.

78 MERCURY MONARCH - 6 cyl., auto., p/s, a/c, 4 dr., \$2,000. Ext. 3908 or 585-4038.

TIRES - (2) Tiempo steel-belted radials, P195/75R14, \$10/ea. Ext. 3919.

78 HONDA - 750K, fairing, radio, 11,000 miles, excel., \$1,500, firm. Ed, 929-6798 after 6 p.m.

73 APACHE POP-UP CAMPER - excel. cond., priced to sell, \$1,350. Joe, Ext. 4255 or 289-1831.

82 TOYOTA - 4x4 SR5 longbed pickup, 15,700 miles, loaded, \$7,990. Russ, 928-1209 after 6 p.m.

78 YAMAHA DIRT BIKE - IT250, good cond., many new parts. Nancy, 281-6699 eves.

HEAVY DUTY HAND TRUCK - w/hydraulic lift platform, \$100. 261-7825.

71 CHRYSLER NEWPORT - runs fine, many new parts, best offer. Rich, Ext. 4363 or 924-7238.

79 DODGE DART 318 - p/s, p/b, a/c, 2 dr., runs great, dependable, \$650. 281-7578.

74 CHEVY VAN - small V8 engine, a/c, p/b, p/s, fully customized camper pkg., \$1,800. 821-9280.

77 FORD VAN - small v8 engine, auto., p/b, p/s, am/fm stereo, runs well, \$1,700. 821-9280.

HONDA 200CC - excel. commuter, w/fairing and windshield. Kristin, Ext. 3372 or 744-6287 after 6 p.m.

73 DODGE VAN - 6 cyl., auto., all windows, body excel., custom inside, \$1,400. Joe, Ext. 7961 or 722-3957 eves.

69 CADDY - fully equipped, dependable transportation, asking \$750. 744-7734.

77 DATSUN B210 - good cond., \$1,200. 727-2471 after 5 p.m.

71 DODGE DART - economical, hardtop, convertible, re-engined, very good mech. cond. and body, \$800. Ext. 4230 or 363-7431.

MAG WHEELS - (4), silver, 12" x 5 1/2", 4-lug, with (4) Goodyear Eagle NCT P185R70 tires mounted, \$300. Eric, 289-2352 days.

80 KAWASAKI 650 LTD - red, crash bars, excel. cond., must sell, \$1,550. Bob, 475-2305 or 283-4741 after 6 p.m.

80 TRAVEL TRAILER - Nomad, 24' bunkbeds, full bath, awning, sleeps 8, like new, \$6,800. Richie, Ext. 2175 or 734-7342.

74 VW SQUAREBACK - runs well, \$750. 924-7238 or 286-1183.

SAND RAIL - San Fernando frame, 1,600cc, VW motor, 15" wheels, \$600. Bob, Ext. 2558 or 744-3289.

76 GRAND PRIX - buckets, p/w, p/seats, 66,000 mi., white w/red, new trans., brakes good, \$2,000. Ext. 3379.

77 DODGE D-200 TRUCK - 9 foot self contained slide-in camper, both excel., \$5,000 or sell separately. 878-0514.

81 SUZUKI GS650G - 4 cyl., shaft drive, triple disc, soft saddle bags, excel., \$1,500. Bob, Ext. 2558 or 744-3289.

78 DATSUN 200SX - recent tires, shocks, brakes, alt., and water pump, 5 spd., a/c, sunroof, am/fm cassette, 80K, asking, \$2,650. 281-0360 after 6 p.m.

SNOW TIRES - H78-15 with old rims, studded, \$35. Paul, Ext. 4309.

69 VW - runs well, good cond. Pat, Ext. 3803 or 587-9486 eves.

74 VW BUS CORVAN - warranted Corvair engine, new radials, clutch, p/b, am/fm cassette stereo. Rich, Ext. 2965 or 744-0960.

76 VOLARE PREMIERE - 4 dr., a/c, 6 cyl., cruise ct., hi. mi., mint cond. in/out, \$1,900. 924-6616.

73 DUSTER - V8, manual, runs well, \$600. Doug, Ext. 4095.

72 DODGE SWINGER - V6, auto., body good, new tires, new brakes, needs engine work, \$275. Tian, Ext. 4157.

70 PLYM. - \$200. Ext. 4819 or 289-7218.

Boats & Marine Supplies

24' MENEMSKA SLOOP - keel/centerboard, classic lines, diesel, wood interior. Joe, Ext. 7961 or 722-3957 eves.

16' PENN YAN - 40 HP Mercury, certified trailer, extras, \$2,400 or best offer. Kevin, Ext. 3267.

19' GRADY-WHITE - 115 HP Johnson, 1973, 1980 Shoreline trailer, cuddy cabin, many extras, \$4,500. 475-8162.

21' VIKING - 40 hrs. use, walk around cuddy, Merc. I/O, 4 cyl., excel., \$12,500. Donnie, (212) 835-5287.

18' BOAT - used, trailer, needs fixing, \$100/negotiable. Bill, Ext. 3848 or 281-6498.

17' RENKEN BOWRIDER - 70 HP Evinrude, galvanized trailer, all 1978 extras, immaculate, \$3,900. Bob, Ext. 2558 or 744-3289.

19' THUNDERBIRD - sit down cabin, 105 HP Chrysler, navy top, \$2,200. Stan, Ext. 2075.

MOORING - 250 lb., complete, mushroom, chain, s. ring, 3/4" double rope and pick-up bouy, excel., \$250/firm. Ext. 3848 or 928-6944.

Miscellaneous

EASTER BUNNIES - choice of colors, \$10. 363-6292 eves. and weekends.

GRACO COMBINATION CRADLE - and swing, excel. cond. \$30. 941-4328.

RECORDER - Panasonic, cassette, model RQ-409S, built-in mike and handle, excel. cond., \$30. Ext. 3876 or 4822.

GIRL'S BIKE - 24", Columbia 10 spd., like new, \$50. Richie, Ext. 2175 or 734-7342.

FLOOR WAXER - scrubber, 2 brushes, w/accessories, \$8. Ext. 4602 or 722-4489.

DINING RM. SET - 44" octagon table, 2 leaves, pad, 4 chairs, Mediterranean oak, \$400. 724-4312.

MINK COAT - \$600; cut glass dolls and collectables. 472-0509.

BMX MONGOOSE - 2 rims, alloy cranks, many more extras. 751-8158.

WOOD STOVE - airtight, homemade, burns 12-18 hrs., \$100; Peterson Safety Shell baby car seat, holds up to 40 lbs. Bob, 467-4222 eves.

LAWN MOWER - self propelled, rear bagger, \$100. 744-9677.

COLONIAL LIVING RM. SET - couch, chair and ottoman, earth tones, orig. cost, \$1,200, like new, sacrifice for \$350. Deb, 286-4652.

MUM'S CHEESECAKE - 7" dia. x 2 1/2" thick, 3 lbs., \$12.50. 588-3894.

FRANKLIN WOOD STOVE - \$75; ladies size 6 Nordica ski boots, \$20. John, Ext. 4312.

DRESSER - young child's, \$50; headboard, \$20, both white with yellow trim. Les, Ext. 2920.

DRAPERIES - (2) pr., sheer, sky blue, brand new; 96" x 54" and 96" x 63", \$20/ea. 286-0682.

SHORTWAVE RADIO - Sanyo, portable, with cassette player, twin speakers with stereo, \$60. Ext. 4680.

BICYCLE - German made, small "City Hopper", almost new, lock, storage compartment, tools, must see. \$125. Marsha, Ext. 2871.

FROST FREE FREEZER - Sears, 19.5 cu. ft., excel. cond., \$250 firm. 924-8488 after 6 p.m.

REFRIGERATOR/FREEZER - side by side, frost free, \$100. Donna, 722-4644.

BEDROOM SET - full size bed, hdbd., ftbd., 2 nightstands, trpl. dresser w/mirror, dresser, \$400. 929-4886.

WATER BED - heated, king size on modern platform, \$150. Ext. 7755 or 289-7292.

ANTIQUET PLAYER PIANO - Arnold, 473-6432.

HELMET - full face, Bell professional, size 7 1/4, orig. was \$150, excel. cond., \$100. 289-1705.

FUR COAT - Muskrat, very good cond., \$90. Sharon, Ext. 3995.

DOLLS - huggable 16", \$18; clothes for Cabbage Patch dolls, girl/boy, \$3.50 and up. 737-0246.

STOVE - wood burning, 24 hours, "All-Nighter," antique furniture, record player, \$100; dresser w/four draws, \$100. 281-5605.

VIC 20 COMPUTER - w/game cartridges, priced to sell. Joe, Ext. 4255 or 289-1831.

PUNCH PRESS - standard mach'y, #2B, kick operated, \$100. F. Paffrath, Ext. 4407.

BABY ITEMS - bassinet, crib/dresser, high chair, playpen, carriage, etc. Jeanne, 924-3104.

COLONIAL SOFA - green, \$50; 17 x 12 multi-brown rug, \$50; upright vacuum. \$50. 289-8212.

FIREWOOD - about 1 cord, already cut, \$75; curtains, biege seeded voile, 6/pr. w/valences. Ext. 3565 or 924-8594.

POT BELLY STOVE - antique, cast iron, burns coal or wood, excel., \$100. Rich, 924-8224 eves.

TICKETS - (2) Stuttgart Chamber Orchestra, March 10, SUNY Stony Brook, \$10/ea., 4th row. Dave, Ext. 2694 or 941-9022.

HOT WATER HEATER - electric, 52 gal., Sears Power Miser, like new, \$120. John, 924-5012.

TEMP DINING ROOM SET - 6/chairs, table w/2 leaves, breakfront, sacrifice, \$400. 758-6879 after 6 p.m.

ALPINE DAIRY GOATS - (2) registered, excel. milkers, mild mannered, must sell. 363-2736.

NATIONAL GEOGRAPHIC MAGAZINES - 175, make offer; club chair, \$35; twin chairs, \$20/ea.; flexible flyer sled; Wayne pump, \$15. Ann, 286-2280.

VCR - Sharp, front loading, electronic tuner, 1 program, 7 day recording, like new, \$375. Ext. 5080 or 751-1884.

SOFA-BED - green, \$35; 42" round kitchen table, \$25. 751-7408 after 3 p.m.

WINDOW BLINDS - verticals, mini woven woods, custom colors, 6 sizes. Jim, 281-2849.

JACKET - misses size 6, redwood, elegant, never worn, orig. price \$160, best reasonable offer. Janet, Ext. 2345 or 929-8152.

MILLING MACHINE - Excello, better than Bridgeport, fully tooled, extras, immaculate, \$5,000. Bob, Ext. 2558 or 744-3289.

GREAT DANE PUPS - 8 wks., worth \$300, shots, wormed, only \$75. Chuck, 399-2785 before 10:30 p.m.

FROST FREE FREEZER - G.E., upright 15 cu. ft., gold, very good cond., \$100. Eulyne, Ext. 2456 or 732-6241.

RECLINER - brown tweed, Herculon, like new (but getting older every week), \$100. Karen, Ext. 2950.

JAPANESE COURSE CASSETTES - Linguaphone, texts, instruction, vocabulary, explanatory notes, reader, portable. 472-1397.

LADIES WEDDING RING - 14K gold, 1 pt. diamond, size 4 1/2, very pretty, \$70. Ext. 2733.

ELECTRIC KITCHEN RANGE - fair condition, brown, Joan, 298-9594.

COLOR TV's - need some work, 19" and 12" portable, \$30 and \$20, respectively. Victor, Ext. 2395.

PIANO - upright, woodgrain finish, strikers refelted, asking, \$300. 281-0360 after 6 p.m.

CALCULATOR - TI58C, programmable, 480 steps, constant memory, library module, optional software, \$35. Ext. 3242 or 7192.

DISHWASHER - freezer, washer, dryer, must sell, best offer. Bob, Ext. 3145.

EARLY AMERICAN 2 PC. HUTCH - dark pine, \$450; 5 light Early American chandelier, blue floral pattern globes, \$20. Ext. 2023 or 422-1038.

CANOPY BED - complete w/dresser and night stand, \$125. Stan, Ext. 2075.

DIRT BIKE - Ross, boy's, mag. wheels, 1 yr. old, has racing pads, excel. cond., \$100. 924-1038.

ORGAN - Gulbransen Spinnet, two manual, Leslie speaker, excel., \$250. R. Hildenbrand, Ext. 3273 or 732-5071.

COURT STENO. MACHINE - tri-pod and case, very good cond., \$250. Winter, Ext. 3354 or 924-4208.

DOBERMAN PUPS - AKC docked and cropped, complete, priced to sell. Bob, Ext. 3848.

KIRBY VAC. CLEANER - end tables; couch; Danish sleeper, mason jars, 2.25 doz.; living room sets. 475-8083.

ATARI 2600 - w/attachments, 10 cartridges, Ms. Packman, Phoenix, Pitfall, and others, \$120. 282-3105.

Car Pools

PLAINVIEW - Old Country Rd., to start car pool, 8:30 to 5:00 shift. Hilton, Ext. 4444.

NORTH PATCHOGUE - 3 man car pool, looking for 2 drivers. Bob, 289-1705.

HOLTSVILLE - Birchwood Glenn Apts., individual wishes to join or start car pool. Barbara, Ext. 2456.

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 Rent

SHIRLEY - 1 bdrm. apt., private entrance, working person or couple, no security, \$400/mo., including utilities. 281-3933.

EASTHAM, CAPE COD - June-Sept., 4 bdrm., house, sleeps 8, 2 baths, washer-dryer, dishwasher, ck, near beaches, \$575/wk. 722-3865 eves. and weekends.

SMITHTOWN PINES - beautiful, 3 rm. apt., in private home, separate entrance, \$525 includes all. 543-4641.

SHIRLEY - Tangiers, 1 bdrm., modern, private entrance, utilities included, 5 min. to Lab. 399-6684.

RIDGE - studio apt., 1 bdrm., bath, kitchen, utilities include, \$350/mo. 744 9781 or 473-3162 after 6 p.m.

For Sale

E. NORTHPORT - charming cape, 3 bdrms., 1 1/2 baths, living room with fireplace, EIK, sunroom, pantry, 1/3 acre, SD #4, minutes from parkway and train, \$1,200 taxes, \$129,900. 261-7280 eves.

DORLOO, NEW YORK - 6 wooded acres 30' trailer, access pwr., sewage, stream and pond, paved road, excel. hunting and scenery, \$13,500. Bob, 744-4047 after 6 p.m.

SHELTER ISLAND - new 4 bdrms., 3 bath, large family room, overlooks Gardiners Bay golf course, \$250,000. 331-1718.

Wanted

CHAIN SAWS - reasonable. 722-4679.

GROLSCH BEER BOTTLES - empty or full. Bill, Ext. 2906 or 929-6189.

CANOE - 14'-16", alum. Bob, 467-4222.

TRAVELLER - to Paris, France before May 1, bring suitcase to student, fee negotiable. S. Lacks, Ext. 3369 or 286-1022.

INFORMATION - on local TRS-80 users club/group. 654-0769 after 6 p.m.

ROLLER SKATES - men's size 10, women's size 9. Cameron, Ext. 7190 or 369-1844.

80 TOYOTA TERCEL - or Corolla, low mileage, 5 spd. Debbie, Ext. 3420 or 736-4280.

350 ENGINE - good cond., for 1976 Buick wagon. George, Ext. 4612.

USED SOFTBALL GLOVE - for 12 yr. old girl. Ext. 2964.

TRAINS - Lionel, American Flyer, accessories, any cond. brings good price. Carole, Ext. 3362 or 924-4097 eves.

SEASONED FIREWOOD - full cord at a reasonable price. Doreen, Ext. 2456.

MEN'S HOCKEY SKATES - sizes 11, 11 1/2 or 12. 751-7408 eves.

50-60 HP OUTBOARD - Johnson Evinrude, 1974 and up w/controls. Bill, Ext. 3848 or 281-6498.

ELECTRIC IRON - tennis racquets, golf clubs, bicycles. Phelan, Ext. 3126.

WASHER & DRYER - electric, dependable, needed by Toscanini Day Care Center. Sandra, 689-8424.

BOY SCOUT UNIFORM - donation