BROOKHAVEN BULLETIN
Volume 34 - Number 44 / November 7, 1980
BROOKHAVEN NATIONAL LABORATORY

Hydrogen is an alternate fuel for the future. Here is an award-winning research project that leads to improved hydogen storage.

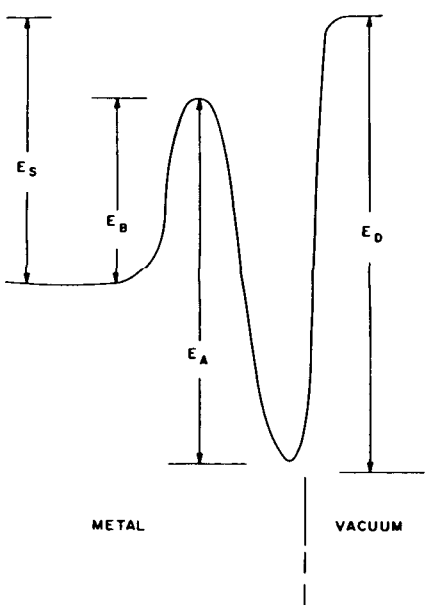
Taking Up Hydrogen

Doug Humphrey

Michael Pick, Metallurgy and Materials Sciences Division of DEE, with his ultrahigh vacuum system used for hydrogen uptake experiments.

Michael Pick, Associate Scientist in the Metallurgy and Materials Sciences Division of DEE, was recently named winner in the category of Pure Scientific Results for the Department of Energy's 1980 Metallurgy and Ceramics Branch Annual Research Award. This is the first year of the competition, which had entries from national labs and institutions supported by DOE's Division of Materials Sciences in the Office of Basic Energy Sciences.

Two other categories were included in the competition: Implication for Energy Technology and Follow Up on Earlier Reported Research. Respective winners in those categories were John W. Morris, Jr. of Lawrence Berkeley Lab and Dewey S. Easton of Oak Ridge Lab.



This diagram illustrates the surface barrier for hydrogen uptake. Imagine a ball poised at the top of the hill on the right. If the ball were to roll down the hill, losing energy on its way, it would get trapped in the deep gully. But if the gully were not so deep, then the ball would have enough energy to roll up and over the other side. This is analogous to hydrogen uptake by a metal. Certain metals can more readily absorb hydrogen if their surfaces are coated with a particular substance. In the analogy with the ball, this substance effectively "raises the gully" so the ball does not get trapped.

This is the first year of competition. It provides DOE recognition for individual scientists who have achieved outstanding research results in materials sciences.

Pick's award-winning work was done in collaboration with Myron Strongin, James Davenport, and George Dienes, all of the Physics Department.

Hydrogen Storage in Metals

The research cited in Pick's award is titled "Enhancement of Hydrogen Uptake Rates for Nb and Ta by Thin Surface Overlayers." The work has application to hydrogen storage in metals.

An abundant element, hydrogen is considered an alternative fuel for the future. Brookhaven has developed a safe method of storing hydrogen in "containers" called metal hydrides. A general characteristic common to materials used as metal hydrides is that they absorb hydrogen like sponges soak up water. "Hydrogen likes to go into them," says Pick. "And once inside, it continues to behave like a gas. No other element does that."

"If we understand how hydrogen goes into a metal, then we can find ways to increase the rate of hydrogen uptake," he says.

The Research

For sometime, BNL scientists have been actively searching for materials which are best suited for hydrogen storage. The usefulness of a hydride is affected by its stability, capacity, and by the kinetics of the system – the rate at which hydrogen can be absorbed and desorbed by the material.

Working with niobium (Nb) and tantalum (Ta) as model storage metals, Pick found that hydrogen was absorbed more efficiently when layers of palladium, another metal, were put on the surfaces of niobium and tantalum. In fact, he found that hydrogen uptake increased to 100 percent with five atomic layers of palladium.

Theory Behind the Work

Pick has a theory to explain the increased hydrogen uptake with palladium. At the surface of a metal, there appears to be a trap that blocks the hydrogen from going inside. Why?

A hydrogen molecule is normally made up of two atoms bonded to each other to form H_2. At the surface of a metal, the H_2 breaks apart into H + H, and the individual atoms are bonded, or chemisorbed, to the surface. Because they are strongly bound, it takes extra energy to get them off the surface and into the metal.

Palladium decreases the strength with which the hydrogen atoms are bound to the surface. "It decreases the chemisorption energy," explains Pick.

The research took six months to complete, and the results have important implications for hydrogen storage. Says Pick, "One might now find composite systems for hydrogen storage with the advantages of one material at the surface combined with the advantages of another material for the bulk."

Other Work

Pick is a solid state physicist who came to the Lab in 1977 to study hydrogen/metal systems. He says Brookhaven is an ideal place to do this kind of work because of the large instruments available here.

His research with palladium layering was done with sophisticated equipment in his division, but he also

(Continued on page 2)

$3 Million To Minority Firms

In fiscal year 1980, the Laboratory awarded $3 million worth of contracts to minority businesses. Over 70 firms participated, and approximately 95 percent of the money went to firms in New York State.

This represents a three-fold increase in awards to minority businesses over FY 1979. A major reason for this success is due to efforts by a Special Task Force appointed by Lab Director George Vineyard in March of this year to work for increased use of minority business firms, and by the Division of Contracts and Procurement. The Lab's target was a 4 percent procurement level; 5.1 percent was actually achieved.

BNL Lecture

International Safeguards

The International Atomic Energy Agency (IAEA) polices the nuclear community of the world. As U.S. Ambassador to IAEA, Gerald Tape, past President of AUI, suggested that U.S. technology and expertise could be made available to upgrade international safeguards applied by that agency.

In 1976, Congress approved an appropriation to establish a program of technical assistance to IAEA. This program, funded by the State Department, aims to bolster the IAEA capability for applying international safeguards. Brookhaven's International Safeguards Project Office (ISPO) has the responsibility for technical management.

Leon Green, Head of the International Safeguards Project Office, will give the next BNL lecture, "National Laboratories in Support of International Safeguards." He will speak on Wednesday, November 19, at 8 p.m. in Berkner Hall.

Currently ten government laboratories and about ten industry participants are providing significant technical assistance. A number of new devices for measurement and surveillance of nuclear materials have been developed. Some are already being used by IAEA inspectors in many parts of the world. Inspector training and other assistance have also been important contributions.

Green will discuss the international safeguards and IAEA's role in assuring that nuclear materials and activities have not been diverted from peaceful uses to nuclear weapons or other explosive devices. Safeguards methods and new developments will be reviewed to show how these techniques may be used to make IAEA safeguards more credible and effective. Finally, he will discuss the unique problems associated with the application of international safeguards and outline proposals for their solution.

Leon Green came to Brookhaven in 1956 as a guest engineer. Two years later, he joined the staff of what was then the Department of Nuclear Engineering. From 1966-68, he took a leave of absence to work in Vienna for the IAEA in the economics section of the department of nuclear power and reactors.

When he returned to the Lab in 1968, he joined the newly formed Safeguards Group. In 1977, the International Safeguards Project Office was established in the Department of Nuclear Energy. One year later, Green was appointed head of that office.

Doug Humphrey

Leon Green

Green holds a Bachelor's degree in chemical engineering from Drexel University in Philadelphia. He is a member of the American Nuclear Society and the Institute for Nuclear Materials Management.

A buffet supper is served at 6:30 p.m. at the Brookhaven Center before the lecture. Many find it convenient and it is a pleasant way to meet members of other departments. Reservations for the buffet should be made in advance by calling Ext. 3541 before 5 p.m. on the day of the lecture.

Pick (Cont'd)

does neutron diffraction work at the High Flux Beam Research Reactor and depth profiling of hydrogen at the Tandem Van de Graaff.

The latest addition to the array of tools available to materials scientists at the Lab will be the National Synchrotron Light Source. Pick is working on building an Extended X-ray Absorption Fine Structures beam line (EXAFS) that will be attached to the NSLS.

Pick has devoted most of his career to the study of metal hydrides. Before coming to Brookhaven, he worked on metal hydrides at the Kernforschungsanlage Jülich, a national research lab in Germany. He also did his Ph.D. thesis on the subject.

Who Is William E. Lenz?

Will the real William E. Lenz please come forth. . .

One William E. Lenz works in the Physics Department as a Technical Associate in the High Flux Beam Reactor. The "E." stands for Ernest.

Then there is William E. Lenz, "E." for Ernest, also in Physics, but as a Prinicipal Technician specializing in fabrication and design. This Wlliam has a Jr. after his name, and, of course, is the son of William E. Lenz.

Clear enough? Last week's *Bulletin* article on the Employee Relations Committee managed to get the two of them confused. William E. Lenz, Jr., member of the committee, has been with the Lab for only 5 years instead of 17. Sorry for the error.

Lecture Reminder

Environmentalist Russell W. Peterson, President of the National Audubon Society, will present the 23rd AUI Distinguished Lecture on Thursday, November 13, beginning at 8 p.m. in Berkner Hall. He will speak on "Directions for Science and Technology: Setting a Course That Will Benefit Humankind and Preserve Our Ecosystems." The lecture is open to the general public, and no tickets are needed.

Emergency Closings

The following radio stations will carry notification of BNL delayed openings and emergency closings.

Station	Area	AM	FM
WBAB	Babylon	1440	102.3
WGLI	Babylon	1290	–
WLIX	East Islip	540	–
WHLI	Hempstead	1100	98.3
WALK	Patchogue	1370	97.5
WBLI	Patchogue	–	106.1
WRIV	Riverhead	1390	–
WRCN	Riverhead	–	103.9
WLNG	Sag Harbor	1600	–

Selected Reading

New Sci. 88 (1224), October 23, 1980
Can science come back to Islam? Z. Sardar. 212-16

Sci. 210 (4468), October 24, 1980
Energy sweepstakes: Fusion gets a chance. A. L. Robinson. 415-16

Sat. Rev. 7 (15), November 1980
Why Michener never misses. H. Mitgong. 20-4

U. S. News & World Report LXXXIV (17) October 27, 1980
U. S.-Japan: "Most Important Relationship in the World." Interview with M. Mansfield. 44-5

Micrographics Conference

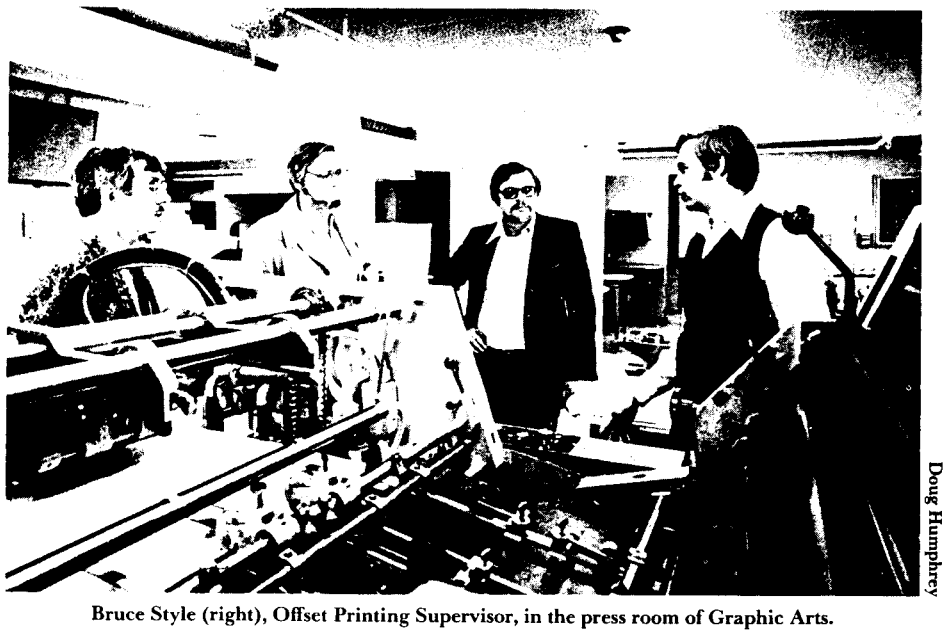
Micrographics refers to images much too small to read without magnification. The advantages are many. For example, think of the space saved in record keeping if documents were photocopied, and the photos reduced to a hundredth of their original size. One 4 by 6 inch microfiche contains as many as 392 pages of information, which is equivalent to a one inch thick document printed on both sides.

Doug Humphrey

Lily Liu, Senior Graphic Arts Analyst, showing an example of output from a new camera to members of the DOE/Contractor Micrographics Association during their tour of the micrographics facilities in Graphic Arts.

The DOE/Contractors Micrographics Association was established to share information on and promote the use of micrographics. Nicholas Parrinello, Accelerator Department, is chairman of the association. At Brookhaven last week, the association held its 8th Annual Conference. Micrographics users from all over the country met to exchange information about systems and equipment at their own facilities.

The conference was arranged by Parrinello; Ken Boehm, Photography and Graphic Arts; and Irwin Lewis, Applied Math; all members of the association. At the end of the conference, some of the attendees took a tour of micrographics facilities in the Accelerator Department, Applied Math, and Graphic Arts.



Doug Humphrey

Bruce Style (right), Offset Printing Supervisor, in the press room of Graphic Arts.

You Can Extend A Helping Hand

The United Way campaign is well underway. United Way Services are available to all segments of our community. Help is available in the areas of health and rehabilitation services, homemaking, housing/fuel assistance, senior citizen services, and many more. Need, not income, is the decisive factor in the use of agency services.

At the start of the campaign, department coordinators were invited to visit a number of agencies supported by United Way in order to acquaint them with the program. They visited a work activity center where mentally retarded adults have the opportunity to do rewarding work geared to their own capabilities. Here they found 500 people living productive lives, making money by repairing furniture, printing, and other activities. Many of these people will be provided with ongoing work experiences in the activity center for most of their lives. Others are trained to develop their skills to the point where they can find outside employment.

Anne Mauro, coordinator for the Director's Office, was among those who visited the center. She came away from the experience with a "tug at the heartstrings" feeling, not only for her fellow human beings who were being given a sense of dignity and self-worth, but also for the patient, dedicated people who train them.

United Way-supported programs are open to all of us. If you know someone in need of one of the services available, you can become part of the "helping hand" by directing them to the proper agency.

Cooking Exchange

Make ahead cocktail party foods will be prepared at the next meeting on Wednesday, November 12. A variety of appetizers will be served and, of course, a holiday punch to "toast" the upcoming season.

Cooking exchange meetings are held at the Recreation Building from 12:30-2:30 p.m. Admission is $1.00, and babysitting is provided at 25¢ per child.

Ruth Fernow, 928-8465 or Adrienne Usher, 289-7658, will be happy to answer any questions about the meeting.

Diners Note

The Cafeteria will be closed Saturday, November 8 and 22. Snack bar service will be available both Saturdays at the Center Club, 9:00 a.m. to 2:00 p.m.

Cafeteria Menu

Week Ending Nov. 14, 1980

Monday, November 10		
Cream of tomato soup	(cup)	.55
	(bowl)	.65
Salisbury steak & 1 veg.		1.55
Blueberry pancakes & sausage		1.45
Hot Deli – Roasted turkey breast	(on bread)	1.60
	(on roll)	1.70
Tuesday, November 11, Veteran's Day		
Snack Bar Service – 9:00 a.m. to 2:00 p.m.		
Wednesday, November 12		
Beef noodle soup	(cup)	.55
	(bowl)	.65
Irish stew with noodles		1.55
Roasted pork loin & 1 veg.		1.55
Hot Deli – Grilled Reuben		1.55
Thursday, November 13		
Pork & cabbage soup	(cup)	.55
	(bowl)	.65
Roasted chicken w/stuffing & 1 veg.		1.55
Pork & fried rice w/1 veg.		1.50
Hot Deli – Roast beef	(on bread)	1.65
	(on roll)	1.75
Friday, November 14		
Manhattan clam chowder	(cup)	.55
	(bowl)	.65
Shells w/white clam sauce & garlic bread		1.45
Breaded pork chop w/apple sauce & 1 veg.		1.60
Hot Deli – Fried fillet hero		1.55

Reports Available

The following reports are now available to the Laboratory Staff and to Affiliates of the DOE, AUI, and NRC. Others may purchase the reports from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161. Staff members should call Ext. 3484.

BNL 51140 **$4.50**
Intergroup Welfare Comparisons Using Aggregate Consumption Data. D. W. Jorgenson, L. J. Lau, T. M. Stoker

BNL 51149 **$4.05**
Atmospheric Boundary Layer Measurement During Summer Monex 79 at Digha, India. S. SethuRaman, et al

BNL 51161 **$4.00**
The 1979 Breeding Bird Censuses and Summary of 1977-1978 Results. G.S. Raynor

BNL 51167 **$5.25**
Program Summaries for 1979 - Energy Technology Programs. B. Manowitz, Chairman

BNL 51168 **$6.00**
Program Summaries for 1979 - Energy Sciences Programs. D. J. Metz, Editor

BNL 51170 **$6.00**
Staff Roster for 1979 - Environmental Programs. B. Manowitz, Chairman

BNL 51171 **$5.25**
Direct Efficiency Measurement and Analysis of Residential Oil-Fired Boiler Systems. Annual Report, Fiscal Year 1978, Burner-Boiler/Furnace Efficiency Test Project. R.J. McDonald, et al

BNL 51172 **$6.50**
Flash Hydropyrolysis of Coal. Quarterly Report No. 10, July 1 - September 30, 1979. M. Steinberg, et al

NUREG/CR-1404
BNL-NUREG-51179
Transient Analysis of Coolant Flow and Heat Transfer in LMFBR Piping Systems. I. K. Madni

NUREG/CR-1405
NUREG-51180
The NACOM Code for Analysis of Postulated Sodium Spray Fires in LMFBRs. Tsai, S.S.

BNL 51181 **$4.00**
Microwave Longitudinal Coupling Impedance in ISABELLE Vacuum Chamber. S. Giordano and J. Votruba

NUREG/CR-1048
BNL-NUREG-51182
Technical Safeguards Issues for Alternative Fuel Cycles. E.V. Weinstock and B. Keisch

NUREG/CR-1437
BNL-NUREG-51185
Two-Phase Flow Measurement Techniques in Gas-Liquid Systems. O.C. Jones, Jr.

BNL 51193 **$4.00**
BNL Neutral Beam Development Group Progress Report FY 1979. K. Prelec and Th. Sluyters

BNL 51194 **$6.00**
Development of a Glass Polymer Composite Sewer Pipe from- Waste Glass. Final Report, February 1980. R. Rayfiel and L.E. Kukacka

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Published weekly
for the employees of
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French Club

Before the days of TV, even before the widespread availability of printed material, a traditional French way of whiling away the dark hours of winter was to gather around the fireplace, listening to stories told by the most imaginative member of the group. *Le Cercle Français de BNL* will honor this tradition at their next meeting on Wednesday, November 12, at 8 p.m. in the Recreation Hall (apartment area).

Members of the group will share in the reading of poems by modern French writers such as Brel, Prévert, and Aragon. Copies of the French text will be available so that everyone can easily follow the readings. Some of the poems will also be heard in the form of songs for which they provide the text.

Refreshments will be served. A donation of $2 ($1 for students) will be requested from those who are not members of the French Group.

Arrivals & Departures

Arrivals

Wai Yee Keung.....Physics
Aristides A.N. Patrinos.....Energy & Env.
Lewis C. Solem.....Nuclear Energy

Departures

Dibyendu Bandyopadhyay.....Medical
Bharat L. Bhatt.....Energy & Env.
Christopher J. Cyran.....Accelerator
Shu-Chen Dang.....Nuclear Energy
Claire E. Kochendorfer.....Energy & Env.
Michael M. Zepmeisel.....Instrumentation

Bowling

Purple & White League

The Gropers remain in first by 1 point with the Good Guys moving into second. High series was rolled by Jim Griffin with a 601 and games of 224/202/175. High game was rolled by Ken Riker with a 234. For the women, Sharon Smith rolled high game with a 224 and high series 535. Other good games were Elsie Murray 216, Pat Manzella 197, Mary Grace Meier 184, Bill Sells 231, Bill Lebitski 215, Al Pinelli 202, Gene Hassell 200.

Pink League

Great bowling by Maria Apelskog who had a 183 game (76 pins over average), Deb Johnson who had a 534 series including a 208 game and Renie Rosati who had a 515 series. Other good games were bowled by Millie Connelly 179, Marie Grahn 166, Karen Alberico 166 and Ann Parrinello 142.

Red League

The 76'ers won 8-3 over the Sandbaggers. J. Morris (218) had a 601-658 series, R. Larsen (212) 630 gross, E. Meier 623 gross, K. Riker 202 game, J. Petro 610 gross, R. Jones 607 gross. The Designers won 11-0 over the Strangers. J. Ferrante grossed 620. The Old Timers won 8-3 over Isa Team. M. Iarocci bowled a 203/206, W. Reams 206, H. Frei grossed 621, J. Roesler 619, R. Barberich 608, N. Greenlaw 605. The Freon Loaders were shut out 0-11 by the Phoubars. V. Bilms grossed 618, L. Schairer 612.

To Your Health!

Andrea L. Brand, M.D., and Caroline Kramer, R.N., Occupational Medicine Clinic, are co-authoring a series of articles dealing with current trends in the medical field. These articles will be published in the *Bulletin* so that employees can gain a better understanding of health maintenance and prevention of disease.

If you are interested in having a particular topic covered, please send your suggestion to: Andrea L. Brand, M.D., and Caroline Kramer, R.N., c/o To Your Health!, Occupational Medicine Clinic, Building 490.

Toxic Shock Syndrome

Toxic Shock Syndrome (TSS), an illness recognized with increasing frequency in recent months, has alarmed many women because of the syndrome's association with tampon use. Hoping to allay some anxiety about this disease, I will describe its clinical presentation and current facts known about its cause, incidence, and possible prevention.

Toxic Shock Syndrome is characterized by sudden onset of high fever, vomiting, diarrhea, and muscle aches followed by development of decreasing blood pressure and, in severe cases, shock. The patient also develops a 'sunburn-like' rash with peeling of the skin, especially on the palms and soles, about ten days after onset. Complications of heart and lung dysfunction may also occur (*Morbidity and Mortality Weekly Report*, 1980, 29:229-30, 441-5).

The disease typically strikes women (95% of reported cases) who are menstruating (95% of cases of TSS have occurred during menstruation). The most recent study by the Center for Disease Control (MMWR, 1980, 29:441-5) found that 50 of 50 cases (100%) used tampons during the menstrual period associated with their illness, compared to 124 of 150 (83%) of controls. Also found was an increased risk in association with a specific brand of tampon (Rely). As a result of this study, Proctor and Gamble voluntarily withdrew Rely from the the market on September 22, 1980 (MMWR, 1980, 29:470). TSS has been found in users of all five major brands of tampons, but a greater proportion of cases seems to be associated with the use of Rely.

It is important to understand that the association of tampon use with the development of TSS does not prove cause and effect. Many investigators feel that tampon use, particularly continuous use throughout the menstrual cycle, is a co-factor in the development of the disease. Of note is the high incidence of isolation of *Staphylococcus aureus* from the vaginas of cultured TSS patients (98% in one study compared with 7% of unmatched controls (MMWR, 1980, 29:441-5). In male cases of TSS and in female cases not associated with menstruation, *S. aureus* has been isolated from lesions of skin, bone, and lung, (MMWR, 1980, 29:297-9, 441-5). Because *S. aureus* has also been cultured from many normal menstruating women, the possibility exists that the disease may be associated with a toxin produced only by certain strains of this common bacterium. This may explain the discrepancy between the widespread use of tampons and the infrequency of TSS. (MMWR, 1980, 29: 470, and Louis Weinstein, " Follow up on Toxic Shock Syndrome."*Infectious Disease Practice*, August 1980, 3:11).

The incidence of TSS is reported to be three out of one hundred thousand women of menstrual age per year (MMWR, 1980, 29:441-5). The case fatality ratio has been reported 10-15% (MMWR, 1980, 29:229-30), which may be high because severe cases are more easily recognized.

Prevention of TSS may be achieved by the following:

- Women may eliminate their risk of TSS almost entirely by not using tampons.
- Tampon users may reduce their risk by using tampons intermittently during the menstrual cycle (not all day or all night).
- Brands other than Rely should be used.

Women who develop high fever and vomiting or diarrhea during their menses should discontinue tampon use and consult a physician immediately.

—Andrea L. Brand, M.D.

Stony Brook Events

Radio Program: "Arts on Long Island," November 7, an interview with Suffolk Co. Community Profs. Granville Fairchild and David Axelrod, on " The Lou Stevens Show," 6 p.m., WUSB, 90.1 FM.

Speaker: Earth & Space Sciences Prof. Amos Yahil, " The Birth of Stars," November 7, 7:30 p. m., 001 Earth & Space Sciences Bldg. Telescope viewing to follow, weather permitting. An Open Night in Astronomy. (Museum of Long Island Natural Science, Earth & Space Sciences Bldg., open during and after lecture. Information: 246-8373.)

Theater: David Rabe's "Stick and Bones," Nov. 7-8 and 12-15, 8 p.m., Theater II, Fine Arts Center. Students, sr. citizens, $1; faculty, staff, alumni, $2; others $3. Presented by The Other Season. Information: 246-5670, 246-5678.

Speaker: Actor James Whitmore, November 8, 8 p.m., Main Auditorium, Fine Arts Center. $6, $5, $4. Information: 246-7085.

Motorcycle Club

No monthly meeting on Monday, November 10.

License Review for Professional Engineers

An intensive review course of the fundamentals of engineering for the Intern Engineer (Part A) examination to be given in April, 1981, will be offered by Suffolk County Community College starting December 3, 1980. The on-site courses will be 15 weeks long, on Wednesday evenings, 4 hours per night, for a total of 60 hours.

Time: 5:15 to 9:15
Dates: Dec. 3, 10, 17; Jan. 7, 14, 28; Feb. 4, 11, 18, 25; March 4, 11, 18, 25.
Tuition Fee: $120.00 (Checks or Money Orders only payable to: SCCC)
Tuition Refund: 75 percent refundable with certificate of satisfactory completion.

Books will be sold the first night of class. Non-credit registration forms may be obtained from Y. Renee Flack, Bldg. 460. For more information, call her at Ext. 3316. Minimum class enrollment is 15 and the classroom location will be announced.

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to the city on Wednesday, November 19. Departure will be at 7:55 a. m. from the Patchogue LIRR station. Round-trip fare for adults is **$3.25,** 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 **Thursday,** November 13. Make checks payable to "Brookhaven National Laboratory." Your tickets will be given to you on the train. Refunds will be made only if cancellations are received by the Friday preceding the scheduled trip.

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.

The determination of the best-qualified candidate for available positions will be based upon education, experience and other job-related criteria. Such factors will be evaluated and measured against the demonstrable requirements of the available vacancy, as well as the Laboratory's Affirmative Action objectives.

The Laboratory is committed to a policy of Equal Opportunity in its selection and placement of personnel. Its objective is equality of opportunity in employment, training, and promotion without regard to race, color, religion, national origin, sex, age or handicap.

Each week, the Personnel Office lists new personnel placement requisitions. The purpose of these listings is, first, to provide open placement information on all nonscientific 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, as indicated below. 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.

POSITIONS OPEN: Scientific. The following staff positions are open. Candidates may apply directly to the department representative named, or through the Office of Scientific Personnel, Ext. 3338.

POSTDOCTORAL RESEARCH ASSOCIATE - Seek recent Ph.D. to conduct basic research on homogeneous catalytic oxidation. Contact: Dr. Mark Andrews, Department of Chemistry.

POSTDOCTORAL RESEARCH ASSOCIATE - Seek recent Ph.D. with background in inorganic chemistry and chemical physics to work on the electronic structure of solids and surfaces; will utilize the NSLS. Contact: Dr. Jerome Hudis, Chairman, Department of Chemistry.

LABORATORY RECRUITMENT: Opportunity, for present Laboratory employees.

1494. ADMINISTRATIVE STAFF POSITION - Requires a bachelor's degree in a business-related discipline or its equivalent in appropriate experience. Broad background in budgeting and/or accounting is necessary. Several years general administrative experience and knowledge of data processing is desirable. Position requires excellent oral and written communications skills (re-posting of job no. 1152). Director's Office.

1495. CLERICAL POSITION - Requires good typing and organizational skills. Will be involved in records and forms processing, file maintenance, and report and document preparation utilizing word processing equipment. Department of Nuclear Energy.

OPEN RECRUITMENT: Opportunity for present Laboratory employees and outside applicants.

1496. ASSISTANT COMPUTER OPERATOR - Requires successful completion of computer operations training program or equivalent experience assisting in the operation of a large electronic digital computer. Will perform all operational tasks on CDC computers and peripheral equipment. Must be willing to work shifts. Applied Mathematics Department.

1497. CONSTRUCTION INSPECTOR (Architectural)- Requires minimum of five years experience in the inspection of commercial construction projects with emphasis on general construction and structural work. Will be responsible for monitoring all on-site construction (both BNL and outside contractors), checking shop drawings, sketching and estimating. Ability to interpret contract drawings and specification is essential. Design experience desirable. Excellent communications skills are required. Plant Engineering Division.

(Continued on Page 4)

Classified (Continued)

1498. CHEMISTRY ASSOCIATE - Requires BS in chemistry or equivalent background. Should have experience in analytical chemistry and some mechanical abilities and interests. Will work with staff in analyzing a variety of samples. Reposting of Job No. 1419. Department of Energy and Environment.

Autos & Auto Supplies

TIRES - 155x13 on Opel rim; A78x13 snow on Vega rim; (2) F78x14 snows, G78x14. 924-4685 eves.

79 FORD pickup, F150, 4 wd, black, over size tires, roll bar, am/fm 8 trk stereo w/power booster, excel cond, must see. 744-0742.

72 PLYMOUTH - Fury, 2 dr, r/h, good cond. Asking $600. Ext. 2914 or 286-3742 eves/wkends.

65 PONTIAC - Tempest, 326 cu, 4 dr sedan. $200. Bill Stars, Ext. 4278 or 298-9648 eves.

SNOW TIRES - (2) FR78-15 steel belted radials, used 2 months, like new cond. $60. Ext. 4701 or 271-2877.

78 TOYOTA - Corolla liftback deluxe, a/c, a/t, 46,000 mi, 28 mpg at speed limits. $3,955. $400 below bluebook. Ext. 2525.

CARB - fits Ford 289 V8, 2 BBL, factory rebuilt. $30. Dave, Ext. 4173 or 281-6248.

78 SUZUKI - 750cc GSE Model, garaged, excel cond, 4,000 mi. $2,000. 249-8061.

SPEEDOMETER - 0-80 mph - tachometer 0-12K rpm, 9500 red line for 350 and under Honda motorcycles. $40 ea – $70 set. 36" speedometer cable. Bill S., Ext. 2012.

75 BUICK - LeSabre, custom, am/fm stereo 8 trk, a/c, p/s, p/b, spoke rims, excel cond, must see. Leroy James, Ext. 4581.

TAPE PLAYER - 8 trk car tape player, soundwave model 8 as is. $15. Walt, Ext. 7154.

76 VOLVO - 244, 56,000 mi, 5 spd overdrive, a/c and sunroof. 472-9071 after 6 pm.

73 T-BIRD - fully loaded, a/c, stereo, new exhaust and brakes. $1,800. 928-4220 after 6.

SNOW TIRES - (3) VW 6:00x15, used; (1) reg tire. $5 ea. Frank, Ext. 3898.

60 JAGUAR - MK9, 45,000 orig mi, excel running cond, must sell. Best reasonable offer. 473-2664.

DIESEL PEUGEOT - 5 yrs old, excel cond, will go to the highest bidder. Ext. 7103 or 286-1056.

TIRE - F70x15 raised letters Goodyear polyglass, brand new, sell or trade. Joe Cracco, Ext. 2012 or 2005.

72 OPEL - red, 4 cyl, 75,000 mi. $750. 744-6063.

76 FORD - F150, custom pickup, dual tanks, white spoked rims, factory cap, 351 V8, 3 spd. $2,400. Ext. 3457 or 473-7853.

75 FORD - Granada, 2 dr sedan, landau roof, 302 V8, loaded, excel cond. $2,200. Ext. 3381 or 286-1024.

76 TRIUMPH - TR7, new paint, tires and interior, a/c, sunroof, 4 spd, completely rebuilt eng. $3,800. Ext. 3457 or 473-7853.

79 OLDS - Starfire, 4 cyl, 4 spd, 33 mpg, 10,000 mi, showroom cond. Ext. 4666.

TIRE - (1) Michelin w/w radial, never used, J78-15 (225x15). $75. Alyce, Ext. 2902.

71 TOYOTA - Corona Mark II, sta wgn, excel transp, needs some work. $350. 286-0795.

TIRES - L78-15 w/w polyglass, four, good for spares only. $5 ea. Rich, Ext. 3642.

KAWASAKI - KE175, 1978, excel cond, extras. $650. Laurence, 744-5079.

73 OLDS - Cutlass, 4 dr, p/s, p/b, a/c, am/fm, 91,000 mi, 350 V8. $800. Greg, Ext. 4677 or 489-1129.

66 FORD - Mustang, 2,000 ci, 6 cyl, a/t, new brakes, exhaust system, starter, carb, solenoid, voltage reg, interior restored ext good. $1,200. 929-8105 or 929-4701.

66 CADDY - excel cond, low mi. Ext. 345-3131 eves or morning.

SNOW TIRES - F78-14 on Chev wheels, w/w, used 1 season. $55. George, Ext. 2982 or JU8-1713.

TIRES - pair of 155-13" good cond. $20. Frank, Ext. 2024 or 281-3460.

74 DATSUN - B210 hatchback, 30 mpg + $2,500. 727-0995 after 6.

MOTORCYCLE CARRIER - fits most standard bumpers; Ford 289 ci eng radiator in orig carton. Gerry, Ext. 4597.

80 HONDA - Civic, a/t, am/fm, low mi, excel mpg. $4,900 firm. Kim, 878-1514.

73 FORD - Pinto sta wgn, excel cond, good mi, reliable. $950. John, Ext. 3698 or 325-0363.

SNOW TIRES - 6.00-13 mounted rims fit Pinto. $40. Leigh, 286-3517.

HOLLEY CARB - 650, dbl pumper, just rebuilt. $50. Kevin, Ext. 4715 or 878-8450.

TIRES - on rims, (2) Datsun 280Z, snows - 7.75-14, 6.50-13, (2) 6.78-14 steel studded. Kevin, Ext. 4715 or 878-8450.

72 CHEVY - Nova, 6 cyl, 2 dr, 20 mpg, runs good. 212-886-2511.

69 CHEVY - Nova, 4 dr, a/t, p/s, p/b, for only $150. What can you lose? 473-2473.

MOTORCYCLE HELMETS - (2) Man's ADA approved, $40; woman's DOT Crown, excel cond. $25. 475-9294.

73 DODGE - ¾ ton pickup, Club Cab, good cond. 363-6538 after 5 pm.

78 HONDA - XL125 on/off road, low mi, excel cond. $600. 281-0268 or Ext. 2926.

Boats & Marine Supplies

CHRYSLER CROWN - 135 hp, fresh water cooled, Paragon hydraulic transmission w/reduction gear, A-1 cond. $700. 475-8412.

1980 JOHNSON - "Stinger" 75 hp, used 5 hrs, s/s prop. $2,000. Don, Ext. 7772 or 289-7813 after 5:30.

15' FIBERGLASS DUCKBOAT - painted o/d, steering and controls. $150. Charlie, Ext. 3935 or 325-0968.

Miscellaneous

CAMEO ACOUSTIC - guitar w/case, $35; Kimberly elec 6 string guitar w/case/cord, $90; Hagstrom elec 12-string guitar w/case/cord, $125; mint cond. Perfect for beginner or accomplished player. 475-5789.

RAW HONEY - organic unheated, 1 lb $1.75, 1 qt $5. Hugh, Ext. 4660 or 924-3293.

KITTENS - free, 9 wks, 2 male, 2 female, 2 pure black, 2 black w/white paws. Martha Simon, Ext. 2671 or 751-6130.

FRONT ENTRANCE DOOR - 3.0x6.8 crossbuck w/9 windows, oak saddle and weatherstripping, aluminum storm door. 924-4685 eves.

SOLAR COLLECTORS - (4) never installed, Raypac, 37 sq ft, all copper, $250 ea. John, Ext. 4129.

GOLDEN SETTER - male, AKC Registered, shots, 5 mos old. Free. Ext. 4098, 281-8318 eves.

SAVE ENERGY - and money, radiant quartz heater, new, guaranteed, wattage selector, heats fast, new design; slow cooker plus, West-Bend, new; hair dryer w/hat; air cond. Ext. 3131.

BOY'S BIKE - 10 spd (age 9-12), good cond, $35; 42" round wood table, formica top, $20; colonial pine step table w/drawer, $40; pine end table, large drawer, $40. 732-1298.

VERMONT SLATE - ⅜" ass't sizes and colors; oval maple table; GE vacuum cleaner; Pioneer 8 trk home player 924-4685 eves.

TRICYCLE - red, good cond, $10; baby changing table, 3 drawers, $10; dresser, small wooden, good cond, $10; Coleman lantern, $15; wooden table, kitchen cutting/breadmaking, stand-up height, $25. Andy, Ext. 2948 or 722-3168.

MEAT SLICER - ½ hp elect, commercial quality, sells for $400, like new $175. 289-0413.

OSTER TABLETOP - hair dryer w/hood, 720 watts, $15; kitchen lighting fixture, 32 & 40 watt circular tubes, needs rewiring, $9. Les, Ext. 4074.

ARM SAW - 8" radial saw, needs clean up, $25; HO train equipment plus 10x4 table, needs work. $25. Bertrand, 744-2955.

BOY'S CLOTHING - soccer shoes, size 5; two slacks, size 14; two blazers. $25 will buy the lot. Ext. 2914 or 286-3742 eves and wkends.

⅝ WAVE - Penetratur high power colinear ant, $40; adjustable roof rack, never used, $20; Cobra 135, 23 channel w/super side kicker, $200. Mike, 269-9175.

SNOW PLOW - 6 ft, will fit Jeep or Bronco. $175. $175. 281-8044.

SNOW FENCE - 75', chicken wire fence, kitchen table, stack chairs, couch, bricks, answering service machine. Kathy, Ext. 7901 or 281-5605.

FIRE WOOD - approx 1 cord; (2) 14" wheels, GM, $15; assorted children's games. Ext. 7772.

TAPPAN - elec range, 4 burner, large lower oven & broiler plus upper oven & broiler, excel cond. $200. 654-0812 after 5 pm.

HAMSTERS - free, (4) teddybear hamsters only 4 wks old. Ext. 3297 or 821-9547.

CHAIRS - (2) antique white high cane back occasional type w/arms & padded seats. Asking $35 ea. JU4-6019.

ORGAN - elec cord by Estey, 72 balanced bass cords, foot base cords, many features, bench books, excel cond. $350. 475-8658.

BOW - Allen compound 8 alum arrows, quiver carry case, sights. $100. 751-7431 after 6.

CLARINET - Leblanc, like new cond, music stand. $100. 286-1205.

ALUMINUM STORM - screen door 36x80 Luan sliding closet door plus hardware, 48x80. Reasonable. Paul, Ext. 2447.

FIGURE SKATES - lady's, white, size 4 narrow. $8. P. Oster, Ext. 4763.

SKI BINDINGS - Tyrolia Jr., like new. $25. Frank, Ext. 3898.

WASHER - Westinghouse top loading automatic, very good cond, 5 yrs old. $80. 588-6151.

ANTIQUE BUFFET - laminated front, 48" l w/w mirror, excel cond, $85; Hammond Concorde organ, Model 2312, w/tape recorder, 3 yr old, perfect cond. $5,500. Pat, Ext. 2452.

SNOW BLOWER - Ariens, heavy duty 24". $400. 581-7656.

PIANO - Yamaha studio up-right, walnut, excel cond. Asking $2,200. Ext. 3915 or 744-5375.

ROCK POLISHER - never used, orig box, ready for Christmas, $25; 14 spd Waring blender base, works fine, $5; candle making wax, hardener, wicking, $2.50. Marjorie, Ext. 3396.

GREY MARE - 15.1 Hands, excel family, trail or pleasure horse, English or Western. $600. Debbie, 924-0156.

BOY'S COAT - blue, size 8, $10; shirts size 10, $3. Terry, Ext. 2945 or 744-4594.

BABY ITEMS -dressing table,$5; Gerry baby carrier, $3; swing/cradle, $5; Gerico umbrella stroller, $5; booster seat for carriage, $3. 281-8306.

CUB SCOUT UNIFORM -size 12, $10. Rich, Ext. 3642.

FRANKLIN STOVE - American made Washington Foundry, will burn wood or coal. $200. Jack, Ext. 4112 or 744-3919 after 5:30.

BABY CARRIER - Gerry cuddler (newborn to 5 mos), $3.50; kerosene lantern w/extra red globe, $10. Dennis, Ext. 4259 or 736-2534 after 6 pm.

ANDERSON BAY WINDOW - casement, 6'9" wide x 4'2" high, brand new w/screens. $450. Ext. 3497.

10 SPEED - 28" frame Huffy, 6 mo old, like new. $100. Barbara, 727-8183.

STEREO EQUIPMENT - Technics SA7300, 40 w/ chan amp, Technics ST7300 tuner, JVC KD55 stereo tape deck, Garrad 440 turntable. $700. 924-8644.

METAL DETECTOR - Whites 1 DB coinmaster, $75; headphones, $10. Howard, Ext. 2043.

SKI BOOTS - men's 8½, brand new, LeTrappeur, black plastic, $45. Ext. 4727.

BABY ITEMS - GM infant car seat, $12; swing, $7; walker, bassinet, jolly jumper, $10 each. 924-0469.

TV - Zenith color, 23", all tube set, working order. $100. Vinnie, Ext. 3284 or 744-9429.

ONYX CHESS SET - inlaid onyx checker board w/ hand carved pieces, $30; also hanging pots, 3 tier glazed floral design, $15. Lou, Ext. 3506 or 4573.

TYPEWRITERS - (2) Royal portables, models Sprite and Mercury. $35 ea. 475-8658.

PERSIAN LAMB COAT - size 10, excel cond, $300; black cloth coat w/mink collar, size 12, $150; waterbed, queen size colonial, almost new, heater and mattress pad incl; $450. Call 473-9180 after 4.

ORANGES/GRAPEFRUIT - ⅔ bushel, $7.50/$6.50 each. Order now for delivery Dec. 13. G. Price, Ext. 3336.

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

MASTIC BEACH - 3 bdrm ranch, corner lot, roofed patio. Pleasant location near water. Low 30's. 281-7531.

MEDFORD - ⅓ acre, cape, 4-5 bdrm, 2 bath, den w/ fp, l/r with wood stove, large eik, formal d/r, 18x36 in ground pool. $43,900. Jack, Ext. 4254 or 289-6708.

MT. SINAI - 3 bdrm hi-ranch, fam rm, fp, patio, eik, 1½ baths, 100x150 (⅓ acre) semi wooded lot, 20 min from Lab, oil, hw, 10 yrs old, many extras. $35,500. 473-0548.

ROCKY POINT - large modern 3-4 bdrm ranch, central a/c, walk to beach. $58,500. 821-1039.

MANORVILLE - country setting, 3 bdrm, 2-story colonial, 1½ baths, garage, 1 acre + low taxes, N of Expressway, ten min from Lab. Asking $45,000. 727-7149 after 3 pm.

SHOREHAM - 3 bdrm tri-level, 2 bath, d/r, playrm, den, beamed l/r w/fp, deck, covered patio, ¾ acre, oil hw, low taxes, assumable mortg. $60,000. 929-3515.

CENTER MORICHES - M/D on 2½ acres, residential/ business w/200' waterfront, l/r, w/fp, large country kit, 4 bdrms, 2 batths, attached apt with l/r and fp, bdrm, bath and kit. 878-0642.

SHOREHAM - large 4 bdrms, 2½ bath colonial, wooded ⅓ acre lot on quiet street, 2 car garage, eik, fam rm w/fp, excel school district, low taxes, north of 25A. $62,900. 744-4787.

For Rent

SHIRLEY - attractive efficiency apt, furn, priv entr, util incl, excel location, 5 min from Lab and stores, mature gentleman, security. $285. 281-8044.

SETAUKET HARBOR - small, secluded cottage on harbor, bdrm, l/r, eik, bath. $275 plus heat and util. Available Nov 1. 617-864-4037 anytime.

PT JEFF VILLAGE - 3 bdrm ranch, l/r, d/r, fam rm, eik, fin bsmt, fully furn. $675/mo, 2 yr lease desired. Ext. 4074 or 928-0829 after 6 pm.

RIDGE - Strathmore, 3 bdrms, 1½ baths, 5 appl, a/c, carpet, draperies, $400/mo + elect, 1 mo security, no lease, 2 mo advance notification. 924-0581.

PT JEFF STA - 1 bdrm apt, unfurn, $300/mo, util incl. Jerry, Ext. 7611 or 928-2582.

MIDDLE ISLAND - spacious furn room in quiet home & neighborhood. Some privileges. 15 min from Lab. 698-4622.

LAKE RONKONKOMA - share house, 15 mi from Lab. $150/mo + ½ util. 585-8809 eves.

E SETAUKET - 1 rm apt in priv home, sep entr, carpeted, a/c, fp, full bath. $275/mo pays all. 751-7491 after 5 pm.

CENTER MORICHES - house or apt avail Dec to June '81, very convenient to Lab. Levine, Ext. 7102 or 878-1124.

MANORVILLE - 3 bdrm ranch, 1½ baths, garage, country kit, bsmt, all appl, 7 mi from Lab. $435/mo. Pete, Ext. 3868/4574 or 878-1225.

Car Pools

MATTITUCK/GREENPORT AREAS - car/driver needed to complete 5 person car pool. Bill Stars, Ext. 4278 or 298-9648 eves.

PATCHOGUE - via Bellport, opening for paying rider in on-time car pool. Alyce, Ext. 2902.

SMITHTOWN WEST - driver wanted. Ext. 3268.

CORAM - driver wanted to join established car pool from LaBonne Vie Apts. Dennis, Ext. 4259 or 736-2534 after 6 pm.

QUEENS OR NASSAU - rider wanted, off LIE Exits 25 or 36. Richard, Ext. 4134.

BRENTWOOD - (off 2nd Ave.) to start or join existing car pool. 8:30-5:00. Carl, Ext. 7291.

SELDEN - need ride to and from Laboratory, 8:30-5:00. Debbie Lagnese, Ext. 3514.

Lost & Found

FOUND - 20 yr service award tie-bar in Hampton Bays. Ext. 4189.

Wanted

SEALS - "Fun and Fitness" seals from Log Cabin syrup & mix, Awake, Wonder bread, Tang, etc. School saving them. 581-7656.

RIMS - (2) 15" for 1974 Ford. 281-8306.

HOUSEKEEPER - Mon-Fri, 3 pm to 7 pm, meet children at schoolbus, make supper, feed dog, light housekeeping. Must be mature and reliable. 744-4611 after 8 pm.

GIRL SCOUT UNIFORM - size 12-14, pants, blouse, etc. Ext. 4237.

FOLK GUITAR - full sized, Christmas present, good cond. Reasonable. Ext. 2905 or 473-0836 eves.

CHILD'S CAR SEAT - strollee "Wee-Care" or equiv for 2½ yr old. Ext. 3064 or 821-0890 after 6 pm.

SEAT BELTS - Toyota, 2 pr, rear seat, non-retracting. Dennis, Ext. 4259 or 736-2534 after 6 pm.

TRAINS - Lionel, any "O" gauge or "O27" gauge cars, track, and equip. Frank, Ext. 3120.

TOY - Irish mail car in good cond. Bob C., Ext. 2501.

BOYS - ages 10½ and up for Yaphank Boy Scout Troop. John, 924-3492.

POST HOLE DIGGER - Chris, Ext. 4278/163.

WOOD BURNING STOVE - small. Around $150. 728-3874.

HOUSEMATE - share 4 bdrm, 3 bathrm house, 20 min from Lab. $155/mo + ⅓ util. Ext. 2521 or 928-8379 eves.

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

CUB SCOUT UNIFORM - size 12. Ext. 2926 or 281-0268.

BUSINESS ASSOCIATE - flexible hrs, excel income potential, no investment required. Call Mr. B., 698-5861 after 7:30 pm.

BABYSITTER - who lives on-site. For 10 mo old, M-F, 8:30-5:00, non English speaking is fine. M. Rowe, Ext. 2345.

Services

SEAMSTRESS - alterations and tailoring, hem, zippers, dressmaking. Irene, 689-8747.

ODD JOBS - pick up old appl, etc. Vernon, 878-2278 after 6.

BABYSITTER - availablee reliable teenager, anytime. Gina, 929-4753 or Lois, Ext. 2921.

FIREWOOD - split, seasoned oak, 4'x16'x18". $110 delivered. 924-4284 or 924-3919.

PIANO TUNING - and repair. Reasonable rates and conscientious service. 751-4985.

PAINTING - and decorating interior, exterior; paperhanging. Free estimates. 928-4069.

AUTO REFINISHING - all areas of body work performed, small car discounts. Bob, Ext. 2546 or 744-4047.

COAT LININGS - hems, alterations, pillows. Sharon, 878-2591 days or eves.

HOUSECLEANING/BABYSITTING - homemaker for motherless home. Mon thru Sun. 5 min from Lab. 924-3755.

INTERIOR PAINTING - custom workmanship, top quality materials, insured. Bob, 289-7657 after 6 pm.

CHILDCARE - my children in school full time. I have lots of love and attention to give your 3-5 yr old in my home in Shoreham. 821-9547.

HAND CANE/FIBER RUSH - reasonable rates, work will be done for Thanksgiving. Jim, 698-8990.

ORGAN PLAYER - new or old pop music for weddings or parties. Roy, Ext. 4664 or 744-8779.

AUTO BODY - old car will look like new, remove rust, re-metal and paint. 698-6706.

FIRESIDE CHIMNEY SWEEPS - fireplaces, wood, coal and oil flues, dustless removal. Insured. Lab discount. Bill, 584-6425.

JACKETS - men's, boy's, girl's - nylon and pile lined. John, Ext. 2485 or 472-4184.

LIMO SERVICE - luxury chauffeur driven, for proms, weddings, all occasions. 698-2266, 698-2268.

TIRES - new used, repairs. Fred Usack, lunchtime, Ext. 4798.

CARPETS INSTALLED - repaired, quick dependable service. Free estimates. Jim, 821-0187.

HELEN'S HATS - $7. 878-4979.

HOUSECLEANING/BABYSITTING - or homemaker for motherless home, Mon thru Sun, 5 min from Lab. 924-3755.

FIREWOOD - split, seasoned oak, 4'x16'x18". $110 delivered. 924-4284 or 924-3919.

GARDEN ROTOTILLING - yard clean ups, pruning. Tony, 281-0350.

AUTO MECHANICS - foreign and domestic, tune-ups, transmissions, brakes, etc. Tony, 744-4244.

PHOTOGRAPHER - Christmas Special – Color Portrait package, 15 pcs. $29.95. Ext. 7611 or 928-2582.

BABYSITTER - weekends and nights, reasonable, very good with kids, toilet trained only. Ext. 3090.

SOLAR CO-OP - save ⅓ of solar system cost. Make your own professional solar collectors. 931-3200.

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