BROOKHAVEN BULLETIN
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BROOKHAVEN NATIONAL LABORATORY

Earth Sciences Research

The Search for Gold Pans Out

Long gone are the days when miners panned for gold. For the last two decades, in fact, the chief source of gold in the United States has been gold deposits in sedimentary rock, much of it invisible even under a microscope.

Of course, what drives the quest for gold is economics. Earlier this week, the price of gold was $13 a gram, making even "invisible" gold profitable to mine.

A few months ago, an earth sciences experiment at the National Synchrotron Light Source (NSLS) yielded startling information that may prove to be exciting to the gold mining industry. Certainly, it has caused a stir among geologists.

A team of scientists led by co-principal investigators James Chen, State University of New York at Geneseo, and Edward Chao, U.S. Geological Survey, Department of the Interior, found invisible gold where it was not predicted to be and did not find any where it should have been. They were studying samples of ore from Carlin, Nevada, an area that is the most important commercial source of gold in the U.S.

Although cautious about their results and quick to point out that more experiments to confirm them are even now being done at the NSLS, Chen thinks that their findings are not likely to be disputed.

His confidence comes from their experimental technique, unique in that it uses a new microprobe (beam line X-26C) at the powerful NSLS, a combination that makes it possible to detect traces of gold in the range of one part per million or less, with a spatial resolution at or below 20 microns. The technique is called SXRF, for synchrotron-induced x-ray fluorescence, and these scientists say it is superior to most alternative methods, none of which can pinpoint the location of such a small amount of material.

"For about 20 years," says Chen, "people have thought that gold was located in the pyrite in the ore. When we did the first experiments, we naturally looked for gold in pyrite. It wasn't there in the samples analyzed. Instead, we found gold in the matrix material surrounding the pyrite."

Adds Chao, "Knowing where the gold is deposited will help answer the basic geological questions of how and when it was deposited." He also points out that knowing the location of the gold is critical information in deciding how to process the ore.

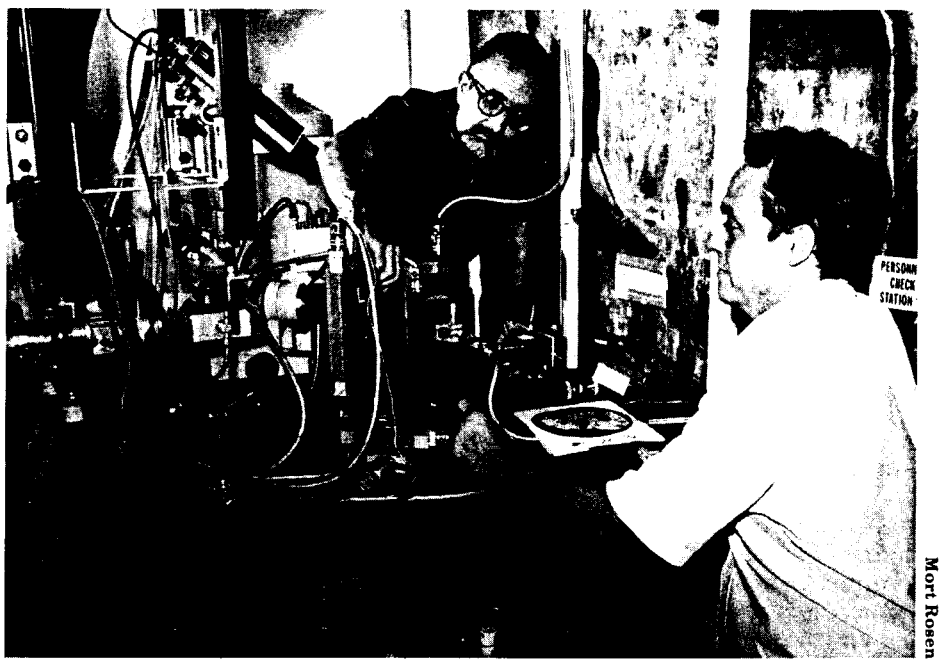
Their first round of experiments were done on samples of unoxidized ore (known to contain invisible gold, although its presumed location is now apparently wrong). "Even though the concentration of gold is small, there are tons and tons of unoxidized gold sitting in the hot sun of Nevada," says Chen. "And with gold prices so high, it's profitable to go after such small amounts."

In addition to Chen and Chao, the experimental team also includes Mark Rivers and Stephen Sutton, affiliated with the Department of the Geophysical Sciences at the University of Chicago; Jean Minkin, Judith Back and William Bagby, U.S. Geological Survey; and Barry Gordon, Albert Hanson and Keith Jones, all in BNL's Department of Applied Science.

Says Jones, who was instrumental in getting the microprobe beam line built at the NSLS, "The fact that so many different institutions are represented on this team attests to the attractiveness of the Light Source for doing earth sciences research. Already, we have an established user community from the U.S. and Europe, pulled here by the combination of instruments available and the Lab's willingness to work with outside users on research projects at BNL."

With various projects already in place (see box), says Jones, Brookhaven is looking ahead to formally establishing a regional center in the earth sciences, with a broad program aimed at understanding the formation mechanisms of the major geological features of the earth.

Development of the microprobe and associated analytical techniques has been funded by the U.S. Department of Energy's Processes and Techniques Branch, Division of Chemical Sciences, under the Office of Basic Energy Sciences. Use of the facilities for earth sciences experiments is funded by grants from the National Science Foundation and NASA to the University of Chicago. — Mona S. Rowe



Mort Rosen

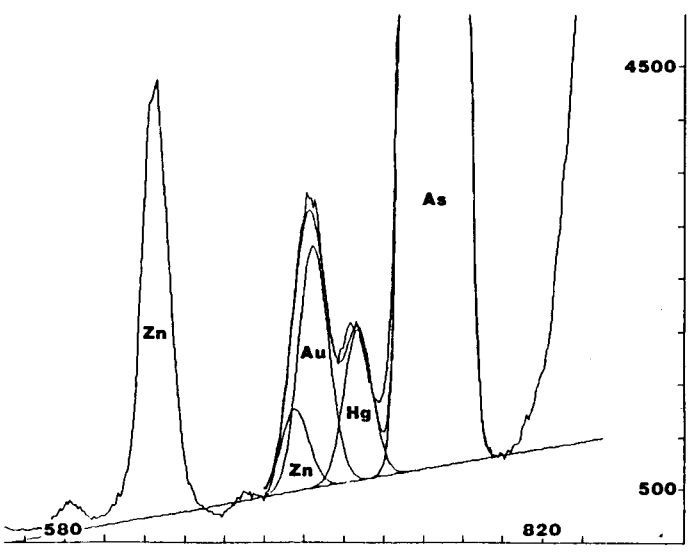
At the National Synchrotron Light Source, Keith Jones (left) and Mark Rivers mount a sample on the microprobe at beam line X-26C.

Other Studies With the Microprobe

Other projects are already under way at the NSLS microprobe beam line, in collaboration with the University of Chicago. Here is a sample:

- **Quartz.** Quartz is the most abundant mineral in sandstone, an important reservoir rock for petroleum. Study of trace elements in quartz will lead to a better understanding of the formation of sedimentary basins, information important to petroleum exploration. Research supported by NSF.
- **Sulfides.** Scientists are looking at common sulfide minerals for elements of the platinum group. The long-term goal is to understand the deposition of these elements and to recover more precious metals in mining operations. NSF supported.
- **Extraterrestrial materials.** Meteorites and particles collected from ocean sediments and Greenland lakes formed by ice melt off are being analyzed for chemical composition, which will help our understanding of the history of the solar system. Later studies will include stratospheric particles derived from comets, thought to be the most primitive objects in the solar system. Supported by NASA.

Photomicrograph of a sample of Carlin-type gold deposit. Analyzed by synchrotron-induced x-ray fluorescence, the sample yielded the startling result that gold was not detected in the pyrite grain (area 1X), but was detected in the matrix (2X and 3X).



Spectrum from NSLS experiment on gold. The technique used to detect gold (Au) can also measure any element with an atomic number above 13 (aluminum). Besides gold, this particular spectrum shows zinc (Zn), mercury (Hg) and arsenic (As). X-ray energy is along the horizontal axis, and x-ray intensities at various energy levels, which are proportional to the amount of a particular element present in the sample, are along the vertical axis.

Tech Transfer Active at BNL

William Marcuse, head of the Office of Research & Technology Applications (ORTA), is enthusiastic about the interest expressed by industrial concerns in technology developed at the Laboratory.

Last year, two devices invented at the Lab were transferred to private companies, bringing the total to over ten since ORTA was organized in 1981. Three products and one process, developed in collaboration with the Lab, are being commercialized by individual corporations. And, two spin-off companies were formed to use technology originated at the Lab.

The two technologies transferred last year were:

- Air Infiltration Measurement System — Small, inexpensive passive devices developed at BNL are used to measure the infiltration of cold air from the outside into a heated building. At the end of the sampling period, the devices are analyzed to determine the air infiltration rates, using techniques also developed at BNL.

The National Association of Home Builders Research Foundation, Rockville, Maryland, will use this system nationwide to inform home owners if they need to weatherize and to certify the tightness of new homes and building materials.

- Thick-Film Hybrid Preamplifiers — Tiny preamplifiers that are low in noise, power dissipation, input capacitance and price are used with various radiation detectors. The hybrid preamplifiers can be used in medical and nuclear electronics, electro-optical systems, portable detectors, mass spectrometers and nuclear instrumentation for oil and coal exploration. Marketed around the world, about 10,000 of these preamps were sold in 1985, and almost 75,000 units will be manufactured this year.

"BNL technology has never been kept a secret — it has always been free to transfer," says Marcuse. ORTA's job is to ease the way for the transfer to take place.

To do this, ORTA last year increased its interaction with the private sector. "We are trying to make the Lab a more inviting place for private industry," explains Marcuse.

For instance, ORTA has been instrumental in negotiating with the U.S. Department of Energy, New York State and Suffolk County officials for their support of a small "incubator"

(Continued on page 2)

Scholarship Presentation

Rosemary Baker of West Hempstead has been selected as the first recipient of the Chasman Scholarship for Women, sponsored by Brookhaven Women in Science. The award will be presented on Monday, August 25, at 4:30 p.m., in Room B, Berkner Hall. All are invited to attend, and light refreshments will be served.

On Site

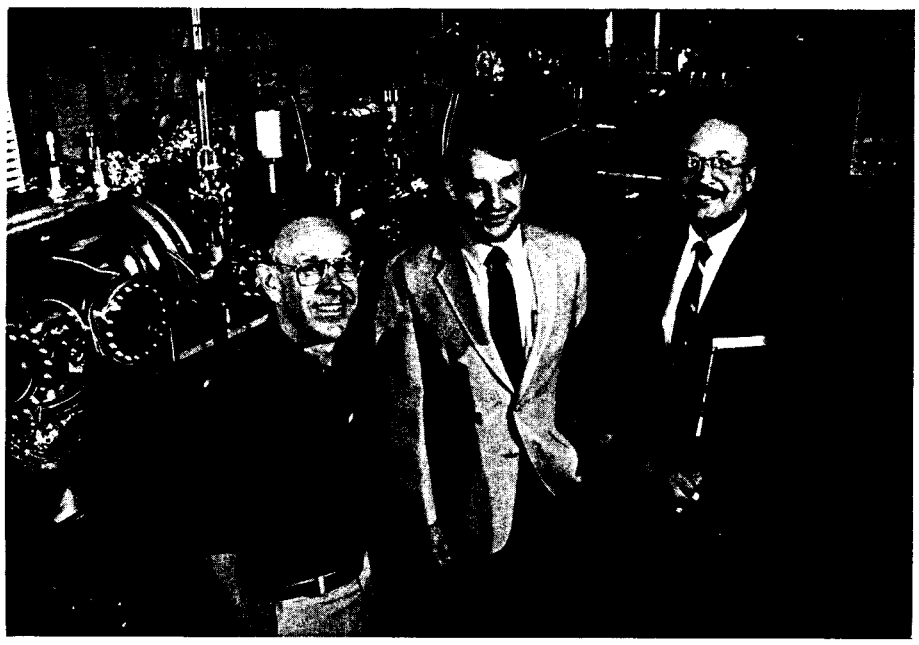
As part of an on-going construction project to expand and improve the Lab's steam heat distribution system, the following road areas will be closed for about two weeks, beginning Monday, August 25:

•**Brookhaven Avenue, between Center Street and Pennsylvania Avenue.** Center Street and Pennsylvania Avenue will not be obstructed and may be used for a detour around the construction.

•**Lewis Road, behind Bldg. 134.** Construction will take place between the openings to the circular driveway in front of the Chemistry Bldg., 555. The driveway will not be obstructed and may be used for a detour.

For more information, call Ed Murphy, Ext. 3466.

Sunday, August 24
Last public tour of the season.
Come any time between 10 a.m. and 3 p.m.



Mort Rosen

Warren Miller (right) Deputy Director for Energy Research and Technology, Los Alamos National Laboratory, spent a day at the Laboratory last week. During his visit, he stopped at the Los Alamos beam line at the National Synchrotron Light Source. With him are Walter Trela (left), Los Alamos physicist who mans the beam line here, and Michael Knotek, chairman of the Light Source.

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. Dept. of Commerce, 5285 Port Royal Rd., Springfield, VA 22161. Staff members should call the designated contact at the extension listed.

NUREG/CR-4311
BNL-NUREG-51902
Contact: C. Conrad, Ext. 2272
Review of the Shearon Harris Unit 1 Auxiliary Feedwater System Reliability Analysis. Prepared by: A. Fresco, et al.

BNL-51947
Contact: S. White-DePace, Ext. 7114
National Synchrotron Light Source. Annual Report 1985. Editors: W. Thomlinson, et al.

NUREG/CR-4433
BNL-NUREG-51936
Contact: N. Yerry, Ext. 2335
Document Review Regarding Hazardous Chemical Characteristics of Low-Level Waste. Prepared by: B.S. Bowerman, et al.

BNL-51939
Contact: L. Santella, Ext. 7918
Compact Coal Combustion with Integral Dry Ash Removal. Annual Report Oct. 1, 1983 - Sept. 30, 1984. C.R. Krishna.

NUREG/CR-4450
BNL-NUREG-51944
Contact: N. Yerry, Ext. 2335
Management of Radioactive Mixed Wastes in Commercial Low-Level Wastes. Draft Report for Comment. Prepared by: C.R. Kempf, et al.

NUREG/CR-4372
BNL-NUREG-51914
Contact: A. Fort, Ext. 2114
Probabilistic Risk Assessment (PRA) Applications. J.C. Higgins.

Mort Rosen

The staff members of the Office of Scientific Personnel (OSP) and the Affirmative Action Office have spent the last two weeks packing and unpacking. Both offices have moved out of 460 and into 185 — into a new wing of the Personnel Building. Scientific Personnel will report to Robert D'Angio, Manager of Personnel and Labor Relations, and Affirmative Action will continue under the jurisdiction of the Director's Office.

At the door of the Administration Building (460), Ann Mauro (left) and Edie Thornhill of OSP leave with some of the smaller items as Rigger Fred Ligon prepares to take some files to the waiting van. The OSP staff can be reached on the following extensions: E. Gail Williams, Ext. 3338; Ann Mauro, Ext. 7814; Edith Thornhill, Ext. 7813; and Jean Stafford, Ext. 3336 and 3337.

On moving day, Renee Flack walks up the steps of the new wing of Personnel, ready to move into the Affirmative Action offices. Assisting her in the move are Riggers Fred Ligon (left) and Charles Johnson. Affirmative Action telephone numbers remain the same, namely: Earl Blanton, Ext. 3318; Renee Flack, Ext. 3316; and Frances Ligon, Ext. 3709.

Tech Transfer (Cont'd)

at the Lab to help new-born technical companies through their infancy. Says Marcuse, "Such a company would benefit from the Lab's environment: the proximity to technical people, research and the library. And we would be helping to increase technology-based industry already on Long Island."

Frank Salzano, who initiated a special ORTA outreach effort, is talking with electric utilities about how Lab technology can assist them. "The resources to do the testing and analysis are not available in the private sector," explains Salzano, "And by helping the utilities in this region, we will eventually be able to transfer the technical know-how to utilities across America."

Among other possible collaborative projects is a characterization of coal for use in different coal-fired, electricity-generating furnaces. "Different coals burn differently and produce different kinds of ash," explains Salzano. "These characteristics are important to know because different kinds of coal must be burned in different furnaces."

Electric utilities from the Northeast will participate in an ORTA-sponsored meeting at BNL during the first week in November to discuss utility plant longevity, coal characterization and materials studies.

Another upcoming meeting, of National Synchrotron Light Source staff, semiconductor-equipment manufacturers and computer-chip makers on August 25-27, is being co-sponsored by ORTA. "The expertise and technology to design and build the compact synchrotrons needed by chip manufacturers resides at the national labs," explains Marcus. "As part of our technology transfer effort, BNL is collaborating with the semi-conductor industry to determine their specific needs and design a prototypical commercial light source that would meet their specifications."

In addition to inviting industry to look around the Lab, Marcuse invites BNL scientists to look around their laboratories. He requests, "Those at the Lab who think they have a device or a process that has commercial applications, please let my office know." — Marsha Belford

Patent Awarded

Terje A. Skotheim, William E. O'Grady, and **Clovis A. Linkous,** all in DAS, were granted U.S. Patent #4,571,029 for inventing an electro-optical display device that can be rapidly switched from one visual state to another and that possesses inherent memory to retain the display in any of its various display states for either an indefinite period or a selected interval of time.

Electrochromic display devices of various types are generally well known and have come into extensive use in products such as digital display watches and video game display panels. In such early devices, a color change was typically effected between a single dark color and a white or yellowish color, but no other variations in color were available. Because of the use of electrode deposition mechanisms, changes in color display were slow in both the write and erase modes, and a significant amount of power was required to achieve them.

The new device uses an electrically conductive polymer film that incorporates embedded pigment molecules as counter ions. One resulting advantage is that the device can be rapidly switched from one color display state to another. Also, the device can be switched to different color states as a function of changes in electrical potential between the display electrode and a counter electrode in the device.

Speaking Out

Reporter: Anita Cohen
Photographer: Peter Horton

On the plus side of summer are sunshine, warmth and longer days. But insects are fond of summer too, and pests like mosquitoes can threaten our enjoyment of this lush season. Are mosquitoes a problem for you this year?

Chang Park (Nuclear Energy) — In East Patchogue where I live, I have a lot of problems with mosquitoes, and other bugs too. But I think my skin is not that sensitive to mosquito bites, although I got several while I was playing golf.

Sharon Atkins (Contracts & Procurement) — I do have a problem with mosquitoes. I live by a farm in Aquebogue, and I also have allergies. It's all really a problem right now. I just use a lot of bug repellent.

George Trigg (Physical Review) — I live in Brookhaven Hamlet, and, up until about two weeks ago, I didn't have a problem. But once the rains came, everything started growing, and mosquitoes were among the everything. But it's bearable. I use mosquito repellent when I mow the lawn.

Walter Powell (Central Shops) — There's no mosquito problem in Coram — the bug zapper takes care of that. But we are infested with gypsy moths this year. That's the only problem, that and ticks. I took the trees down to get rid of the gypsy moths. It was a good excuse to get the trees down for a swimming pool.

Dan Spandau (Applied Science) — I moved to Rocky Point this year, and it's the first year I haven't been bothered at all by anything. Maybe it's because I eat a lot of garlic.

Dominick Bartolomeo (Physics) — No, as a matter of fact, I don't have many mosquitoes where I live in East Patchogue. But bees and wasps are a problem all summer. A couple of years ago I was stung by a wasp and got very sick — I was walking barefoot in the clover, and it got me on the big toe. Now I live across from the hospital, so I don't have to go too far.

Mihai Radulescu (NSLS) — I don't have any problem with this, but something strange happened last night with my car. I live in Ridge, and I park the car outside with the windows open. About 9 o'clock, I tried to close the windows, and I heard a strange, big noise inside the car. I looked inside with a flashlight, but I couldn't find anything. I still don't know what it was, or if it's gone. Even now I wonder.

Rita Straub (Medical) — It wasn't a problem in Brookhaven Hamlet until the last two weeks, and it's gotten rather annoying outside. I know they're going to spray, but I hope they just kill mosquitoes and I don't know how they will manage that, especially this time of year. I noticed the warblers are starting to migrate. Any poison will kill anything as long as there is enough of it.

Karol Mena (Physical Review) — I live right on the water in Mastic Beach, and mosquitoes really haven't been a problem this year. But I do have a problem with sand fleas. They come up through the floor right into the house. My cats come inside and get fleas. I spray and buy the bombs and it relieves the problem — temporarily. The fleas are the worst they have been in years.

Met Opera Tickets

Starting Wednesday, September 3, Family Circle tickets for certain performances of the 1986-87 Metropolitan Opera season (see below) will go on sale at the BERA Sales Office in Berkner Hall. Office hours are from 9 a.m. to 2 p.m. Employees may purchase as many pairs of tickets as they wish. All sales will be final; no refunds or exchanges.

Ticket Prices:

Tuesday & Friday evenings	15.50
Saturday evening	16.50

Schedule

Date		Seat Location
September		
Fri. 26	Aida	G202, G204, H202, H204
Sat. 27	Madam Butterfly	D206, D208, E210, E212
Tue. 30	Die Walkure	B108, B109, B113, B114
October		
Fri. 10	Madam Butterfly	G202, B204, H202, H204
Sat. 18	Le Nozze di Figaro	D206, D208, E210, E212
Tue. 21	Le Nozze di Figaro	B108, B109, B113, B114
November		
Fri. 21	Romeo et Juliette	G202, G204, H202, H 204
Sat. 29	Romeo et Juliette	D206, D208, E210, E212
December		
Sat. 6	I Puritani	D206, D208, E210, E212
Tue. 9	I Puritani	B108, B109, B113, B114
Fri. 12	Die Fledermaus	G202, G204, H202, H204
Sat. 27	Fidelio	D206, D208, E210, E212
January		
Tue. 13	Rigoletto	B108, B109, B113, B114
Sat. 17	Die Fledermaus	D206, D208, E210, E212
Fri. 30	La Clemenza di Tito	G202, G204, H202, H204
February		
Sat. 7	La Clemenza di Tito	D206, D208, E210, E212
Tue. 10	La Clemenza di Tito	B108, B109, B113, B114
Sat. 21	Manon	D206, D208, E210, E212
March		
Tue. 3	Manon	B108, B109, B113, B114
Fri. 13	Manon	G202, G204, H202, H204
Sat. 14	Carmen	D206, D208, E210, E212
Tue. 24	Dialogues of the Carmelites	B108, B109, B113, B114
Fri. 27	Dialogues of the Carmelites	G202, G204, H202, H204
April		
Fri. 3	Samson et Dalila	G202, G204, H202, H204

Copies of the complete season's schedule may be picked up at the BERA Sales Office during open hours. Call Ext. 3347 for information.

Equipment Demo

Eberhard Engineering will demonstrate AUTOCAD with application utilities for mechanical, electronic and architectural design on the IBM PC. Large 19-inch screen, high-resolution color graphics will also be shown in the AMD Seminar Room on Tuesday, August 26, from 1-4 p.m.

Swimming Pool

Summer season tickets are valid through Sunday, August 31. During the week of August 25-31, the pool will be open as follows:

Monday through Friday
(Employees only)
11 a.m. to 1:30 p.m.
(Employees/Families/Guests)
2 p.m. to 9:30 p.m.
Saturday and Sunday
(Employees/Families/Guests)
1 p.m. to 6 p.m.
The pool will be closed on Monday, September 1 (Lab holiday).

New Season

Tickets for a new four-month pool season will be sold at the pool starting Tuesday, September 2.

Fees:

Season Tickets (fees not prorated)	
Individual Membership	$25.00
Family Membership	$35.00
Daily Admissions	
Employee/Family Member	1.25
Guest	1.75

Schedule:
Monday through Friday
(Employees only)
11 a.m. to 1:30 p.m.
(Employees/Family/Guests)
5 p.m. to 9:30 p.m.
Saturday and Sunday
(Employees/Family/Guests)
1 p.m. to 6 p.m.

Guest Ruling (Applies to all recreation facilities)

One Guest - An employee is allowed to bring one guest per visit without special permission or prior arrangement. The guest must be accompanied by the employee.

Two to Five Guests - Advance arrangements for two to five guests may be made at the Recreation Office. (No more than five guests per employee is ever permitted.) When such an arrangement is made, the Recreation Office issues an admission card stating the sponsor's name and life number, the number of guests permitted, the date of visit, and the facility to be visited. Guests must be accompanied by the employee, who will be requested to show the admission card at the main gate and at the swimming pool ticket desk.

Arrivals & Departures

Arrivals

James S. Frank ..... Physics

Departures

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

Charles F. Wimpee ..... Biology
Sandra S. Dozier ..... S&EP

Attention Aliens

This is to remind aliens who hold any type of appointment to the Laboratory that they must advise Personnel Records about changes in visa status. Changes that must be reported include extension of a nonimmigrant visa, change in type of nonimmigrant visa, transfer from nonimmigrant to immigrant visa, and granting of U.S. citizenship.

Cafeteria Menu

Week of August 25

Monday, August 25		
Chicken & rice soup	(cup)	.65
	(bowl)	.85
Turkey à la maison w/1 veg.		2.45
Breaded filet of fish w/1 veg.		2.65
Shrimp salad in pita bread (lite weight)		2.25
Hot Deli: Corned beef	(bread)	2.35
	(roll)	2.50
Tuesday, August 26		
Cream of broccoli soup	(cup)	.65
	(bowl)	.85
Prime ribs of beef w/1 veg.		3.50
BBQ porkchop w/1 veg.		2.45
Hot vegetable plate (lite weight)		2.25
Hot Deli: Chili dogs		2.25
Wednesday, August 27		
Split pea soup	(cup)	.65
	(bowl)	.85
Eggplant Parmesan w/1 veg.		2.65
Breast of turkey divan w/1 veg.		2.45
Yogurt & cottage cheese plate (lite weight)		2.25
Hot Deli: Fresh ham	(bread)	2.35
	(roll)	2.50
Thursday, August 28		
Corn chowder	(cup)	.65
	(bowl)	.85
Sweet & sour pork & fried rice		2.55
New England boiled dinner (lite weight)		2.45
Hot Deli: Ham & cheddar cheese melt		2.35
Friday, August 29		
Seafood gumbo	(cup)	.65
	(bowl)	.85
Salisbury steak w/1 veg.		2.45
Pepper steak over confetti rice		2.45
Fresh broiled fish w/1 veg. (lite weight)		2.65
Hot Deli: Roast beef	(bread)	2.35
	(roll)	2.50

Dowling College Registration

Beginning with the Fall 1986 semester, Dowling College will be offering courses on site. Anyone who missed registering for a course has one more chance — on Tuesday, August 26, from 11 a.m. to 2 p.m. in Berkner Hall.

Courses scheduled include Principles of Management, Money and Banking, Intermediate Accounting I, and Comparative Government. For more information, call Mary White, Ext. 7994, or Pat Knisely, Ext. 7631.

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ANITA COHEN, Senior Reporter
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Speakers Bureau

Summer

Donald Gardner (Phys.), Career Day at Bellport Middle School, Careers in Physics, May 9.

Stephen Musolino (S&EP), Massapequa Science Class, Radiation, May 15.

Donald Gardner (Phys.), Suffolk County Science Explorations, The Why and How of Particle Accelerators, May 19.

Michael Creutz (Phys.), Suffolk County Science Explorations, Elementary Particles, May 19.

Michael Creutz (Phys.), Nassau County Science Explorations, Elementary Particles, May 20.

John Dunn (Bio.), Smithtown High School East Science Club, Genetic Engineering, May 22.

David Potter (Instr.), Middle Country School District, Evaluating Electronic Circuitry Systems, May 29.

Jan Naidu (S&EP), East Yaphank Civic Association, BNL and the Peconic River, June 5.

Jack Fontana (DAS), Rotary Club of Rocky Point, The Development of Concrete Polymer Applications, July 22.

Gregory Van Tuyle (DNE), East Moriches Rotary Club, Nuclear Power and Chernobyl, August 5.

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 and/or appropriate bargaining unit, 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 Employment Manager, Ext. 2882.

THE VACANCIES LISTED BELOW HAVE BEEN EXEMPTED BY THE DIRECTOR'S OFFICE FROM THE CURRENT FREEZE ON OPEN REQUISITIONS.

SCIENTIFIC POSITIONS OPEN: 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: Position available for recent doctorate (experimental nuclear physicist or chemist) with experience in intermediate energy nuclear reactions, and familiarity with CAMAC electronics and software development. Contact: P. Grand, Department of Nuclear Energy.

LABORATORY RECRUITMENT - Opportunities for Laboratory employees only.

2475. MAIL CLERK - Staff Services Division.

OPEN RECRUITMENT - Opportunities for Laboratory employees and outside applicants.

2476. CLERICAL POSITION - (part-time) Requires excellent, accurate typing skills and attention to detail. Duties will include processing of books, journals and reports; computer inputting and heavy telephones. Previous library experience helpful but not necessary. Department of Nuclear Energy.

Autos & Auto Supplies

83 PLYMOUTH TURISMO - 29k mi., 2.2L/5 spd., sunrf., Shelby sport, stereo/cass., louvers, GT sport, showroom cond. extras. $4,800 neg. Ralph, Ext. 2368 or 928-6654.

77 AUDI FOX - sunrf., new tires, 4 spd. $600 or best offer. Cindy, Ext. 3301 or 924-1287 after 6 p.m.

65 CORVAIR - Model 500, 4 dr. sedan, 68k orig. mi., 100 eng. $400 or best offer. 473-4542.

81 FORD MUSTANG - excel. cond., p/b, p/s, a/c, a/t, am/fm cass. $3,200. Scott, Ext. 7578.

67 CHRYSLER CONVERTIBLE - p/s, p/b, p/w, a/t, 383 V8, new top, new seats. Tony, 698-9274.

82 MAZDA 626 LX - 5 spd., sunrf., am/fm cass., orig. owner, garaged, excel. cond. $4,000. Carol, Ext. 3630 or 929-3860.

77 PONTIAC BONNEVILLE - excel. cond., 2 new tires, orig. complete muffler. $1,500 neg. Ext. 7681.

77 DATSUN KING CAB - pick-up, w/cap, 4 spd., 73k mi., good cond. $1,100. Al, Ext. 5128.

72 MERCURY MONTEGO - 58k mi., runs excel. $500. Dan, Ext. 4987 or 698-7322.

77 PINTO - 77k mi., runs well, new exhaust, tires, brakes. must sell, asking $600. James, 744-5422.

79 FORD F-250 - 4x4, auto., 351M, 57k mi., cap, plow, many extras. $7,200. Kevin, 281-3260.

72 OLDS CUTLASS SUPREME - very good running cond., best offer. 924-0582 eves.

78 DATSUN 510 - station wagon, 4 spd., good running cond., a/c. $800. Lew, Ext. 5193 or 928-4863 eves.

74 DODGE DART - slant 6 , new exhaust, new cluth, for parts. Jurg, Ext. 3422 or 821-3243.

69 FORD FAIRLANE - 8 cyl., 4 dr., a/t, new tires. $400. Jack, Ext. 4722.

76 CADDY COUPE - good cond., full power, must sell. $1,300. Art, Ext. 5033 or 654-5479 after 5 p.m.

77 LINCOLN - no rust, clean, luxury, 93k mi., mech. perfect. $1,499 neg. Ext. 2735 or 475-4690.

82 PLYMOUTH HORIZON - hatchback, good engine, 35k mi., new starter. $2,500. Carol, Ext. 2907 or 928-8379.

79 DODGE CHALLENGER - 2 dr., 4 cyl., 5 spd., a/c, am/fm cass., good cond. $800. Steve, Ext. 3822 or 929-6527.

80 CADILLAC COUPE DEVILLE - new diesel eng., good cond., a/c. $2,900, Ginny, Ext. 4057.

84 CHEVETTE - 25½k mi., std.,. sunrf., am/fm, red pinstripe, asking $3,500. 722-3843.

71 SUPER BEETLE - rusted body, 40k mi. on rebuilt motor, two good tires. $100. Ext. 4930 or 744-5892.

83 CHEVROLET MONTECARLO - Landau, 34k mi., orig. owner, am/fm cass., loaded, immaculate cond. Ext. 7686 or 878-0897.

73 FORD RANCHWAGON - full-size, seats 8, depend. transport., new 5-year battery. $350. Jack, Ext. 4447 or 744-3919 eves.

71 VW BUG - body, good, many new parts. $700. Eileen, Ext. 4194 or 924-4922.

81 FORD PICK-UP - F150, a/t, a/c, p/s, p/b, duel-tanks, c/c, excel. cond. 265-4715 after 5 p.m.

80 MERCURY MONARCH - 6 cyl., am/fm radio cass., very clean, new tires, good cond., 64k mi. $4,000, 727-5912.

81 FORD ESCORT - wagon, 4 spd., a/c, f.m., p/s, p/b, tint, runs well. $1,375. 821-9296 at 6 p.m.

82 HONDA CIVIC - 4 dr., like new cond., am/fm 8-track stereo. $4,500. Ext. 2384 or 878-0074.

81 CHEVROLET IMPALA - wagon, V8, a/t, a/c, 64,900, silver, runs like new. $1,900. 821-9296 after 6 p.m.

78 FAIRMONT - 2 dr., 4 cyl., 4 spd., p/s, am/fm cass., 38k mi., recond. engine, excel. cond. $1,550. Mike, 929-8142.

84 COUGAR - V6, p/s, p/b, a/c, am/fm cass., booster, must sell. $8,000 neg. 737-6697.

80 VW RABBIT DIESEL - very clean, 84k mi., $1,500 firm. Carla, 289-3090.

76 GRANADA - rebuilt, 302 + trans., new rubber, exhaust, am/fm cass., very good cond. $1,500. 737-1458.

85 FORD ESCORT - a/c, a/t, p/s, am/fm stereo cass. $3,200. Neil, Ext. 2023.

82 NISSAN STANZA XE - hatch back, 62k mi., a/c, auto., c/c, very clean. $3,700. Ext. 3712.

81 SUZUKI RM125 - water cooled, runs well, looks great, must sell. $650. Scott, Ext. 4910/3873 or 727-1429 after 5 p.m.

80 HONDA CIVIC - new trans., very good mech. cond. Ext. 4886 or 282-4886 wknds.

75 HONDA CB550F - 4 cyl., good cond., 7k mi. $450. Walt, Ext. 4028.

84 CHEVROLET CAVALIER - a/t, p/s, p/b, c/c, 4 dr., excel. cond. 265-4715 after 6 p.m.

83 HONDA CIVIC - 1500 S, new tires, sunrf., stereo, 5 spd., 52k mi., excel. cond. $3,500. Ext. 2183/3192.

76 BUICK REGAL - good running cond., a/c, some body rust. $200. Mke, Ext. 7625 or 924-0341.

85 RENAULT ENCORE - 2 dr., white, 25k mi., excel. cond. $4,950. Roy, Ext. 5515/4723.

SUZUKI GS250t - counter-balanced drive shaft for mimimum vibration and wear, w/manual, helmet, luggage rack and windshield, excel. cond. $499. Ext. 4411 or 929-8287.

PLYMOUTH VOLARE WAGON - p/s, a/t, slant 6, dependable, asking $700. Ext. 3300 or 744-8823.

76 WILDERNESS CAMPER - 18', excel. cond. $3,700; 76 Wagoneer w/tow package. $2,500. 585-3417 or 874-3796.

Boats and Marine Supplies

19' RENKEN BOWRIDER - 120 h.p. Volvo I/O, full canvas, trailer. Ron, Ext. 7533 or 286-0353 eves.

16' SILVERLINE - 50 h.p. Mercury, complete in water, w/dock space. $1,700. Ken, Ext. 3263 or 722-4498 eves.

23' SLOOP F/G - 1972, sleeps 4, head galley, dinette, 3 sails, v/g dinghy, mooring, 6 h.p. Evinrude, photos avail. $5,000. Ext. 4605 or 938-8353.

16' VANTAGE BOWRIDER - 69 h.p. Evinrude, bilge pump, extras. $2,000. Ext. 7644 or 929-4295.

16' SAILBOAT - glass, new sails, 6 h.p. Evinrude. $1,400. Ext. 2434.

18' RENKEN BOWRIDER - 1983, 120 h.p., inboard/outboard, trailer, full cover. $6,500. Ady, Ext. 4531 or 331-3785.

Miscellaneous

ETAGERE - 2 coffee tables, end table, smoked glass and leaf. $350. Rich, Ext. 7932.

FREEZER - United, 20 cu. ft., right hinged, excel. cond., clean, w/lock + key, asking $175. Mike, Ext. 3464 or 737-1458.

AIR CONDITIONER - Whirlpool, 5000 BTU, used once, in box. $200; Sears air conditioner, 11,000 BTU, $225. 874-3844.

COFFEE TABLE - dark oak plank, 2x5, WWII ship, trestle base, collector's item. $250. Bernadette, Ext. 3932.

SLIDING PATIO DOOR - 5 ft. wide, alum. frame, single pane, w/screen. $25. Ed. Ext. 4447.

REFRIGERATOR - Adimiral, 14 cu. ft., good cond. $70. Ext. 3224/7793.

CURTAINS - for large window area, 7'x8'. v.g. cond. $20; oil filter, dual, for Ford products. $2. Morris, Ext. 4192.

FURNITURE - Colonial, sofa, two armchairs, good cond. Ext. 7103 or 744-3235 eves. + wknds.

FURNITURE - couch/conv. $50; Singer treadle base, $25; Singer oak base, $25; 16' wood ladder, $15. Pete, Ext. 4819.

MAPLE DRESSER - w/hutch, 6 drawers, mica top. $100. 289-8212.

CAMERA LENS - Kiron 28-200, zoom lens, Pentex mount, excel. cond. $125. Ext. 4153 or 732-5829.

CONSOLE PIANO - Ivers + Pond, cherry mahogany. $350; BBQ gas tank, $10; Bell & Howell Super 8, w/power zoom, $40. Sal, Ext. 2460 or 744-9822.

RANGETOP - Hotpoint, 4 burners, 20x20½, $20; birch box cabinet for rangetop, $20. Jack, Ext. 4447 or 744-3919 eves.

COLOR TV - Sony, 19", $150; speakers, $15. Serban, Ext. 3721.

DELUXE QUARTZ HEATER - never used, excel. make. $35. Ext. 4886.

SOFA - two side chairs, good cond. $250. for all. Rich, Ext. 7932 or 924-4734.

GREENHOUSE - Poly-type, 22'x100', whole house, fan + sprinkler sys., boiler, heavy duty const. $3000. Jim, 289-0896.

SANSUI STEREO RACK SYSTEM - w/extras, excel. cond. $375. Mark, Ext. 5350.

SNEAKERS - Prince, women's, leather, size 7, like new. $45. Chris, Ext. 2907.

RECEIVER - 45 watt, digital tuned mcs., $165; 20 watt Realistic receiver, $75. Scott, Ext. 7578.

DINING TABLE - w/4 chairs, mahogany, Duncan Phyfe, 40"x60" + 3 12" leaves, pads, $800; Hodgeman waders, felt soles, size long, $40; Nordica ski boots, size 7, $15. 286-0379.

COAL STOVE - Haas & Sohn, $400; 6 oak + fabric chairs, $120. Ext. 2008, 928-5875.

RCA COLOR TV - 13", very good cond. $100. 924-0582 eves.

KNIVES - for collectors, 5% off retail, almost all Am. brands, inc. folders. Don, 281-2731 eves.

BEDROOM SET - twin canopy, 3 yrs. old, excel. cond., dresser, night stand, white. 283-0205.

SHAG RUG - 9'x12', gold tweed, $30; Singer sewing machine, port. $25; bedboard, 4'x6', taped edges, $10; 3 desks, birch, single + double drawer pedestals, $50; $75; + $85. 286-0379.

BATHTUBS - antique cast iron, ball + claw legs, 3 for $25; Admiral upright freezer, 15 cu. ft., excel. cond. $75. Len, Ext. 4289, 8 a.m. to 4:30 p.m.

CANNING JARS - 6 dozen, $12; new portable kerosene heater, $40; duck decoys, $3.50 ea; childs bike seat, $2; 1931 Royal typewriter, portable, good, $25; bike rack, $3.50; hand meat slicer, $3.50. 878-6637.

MOVING SALE - color tv, like new, 13", $130; shelf, $140; sofa, $60; dining table w/6 chairs, all prices neg. Ext. 5165 or 924-1460.

PA SYSTEM - 4 speakers, 2 amplifiers, cabinet, $150; dual turntables, $100; mirrors, 6'x6', and 6½'x2', neg. 475-4690.

MOVING SALE - drafting table, vacuum cleaner, couches, bookcases, kitchen table. Carol, Ext. 2907 or 928-8379.

SONY TV - 19", color, $125. Ext. 3392.

CEILING FAN - w/light, new; outdoor house swing; girl's 3 speed bike. 924-1151 eves.

HUNTING JEANS - Thinsulate insulated, camo. green, size 42 reg. (walls), new. $25. R. Mele, Ext. 2514 or 757-3178.

TURNTABLE - Thorens 150, manual, good cond., w/new Audiotechnic cartridge, asking $90. Ext. 2914 or 286-3742 eves. + wknds.

MICROWAVE OVEN - Litton, large, $75; table saw, homemade, ½ h.p., w/rip fence, $20; 3 sleds, small, medium + large, $20/ea. Gil. Ext. 4043 or 878-6676 after 6 p.m.

BIKE - Huffy, child, 20". Ext. 4490 or 744-2275.

DOG CRATE - for training large dog. 473-2473.

VANITY TABLE - w/chair, good cond., reasonable. Ext. 3319.

BUNK BEDS - $25; Toro push reel lawn mower, $10; ping pong table, $25; all very good cond. Len, Ext. 4289, 8 am.m to 4:30 p.m.

MET OPERA TICKETS - balcony, $22/ea; Boheme, Dec. 19, (2); Manon Lescaut, Jan. 23 (4). Dave, Ext. 2694 or 941-9022.

CHINA CLOSET - large walnut, excel. cond. $200; couch + chair, need slipcovers, $50. for both; lounge, $15. Ext. 2529.

MATERIAL - 50¢ a yard, cotton, taffeta, satin, slipcover, remnants for quilts, projects + crafts. Ext. 2529.

MOVING SALE - sleep sofa, 2 dressers, dining table w/4 chairs, coffee table, must sell. Ext. 3575 or 261-5290 eves. + wknds.

RANGE - Westinghouse, avocado, double oven, 40", self cleaning, works fine. $100. 744-0722.

DINETTE SET - solid oak, 42", octogonal table w/4 padded oak chairs. $200. 821-0919.

SEWING MACHINE - in mahogany cabinet, $125; Castro convertible hassock, $25; 3 window fans, $25/ea; 10-speed bicycle, $125. Harriet, Ext. 4926 or 821-2932 after 6 p.m.

Free

WILL PICKUP - your junk cars or trucks, running or not. Ext. 4081 or 874-3844.

CHILDREN'S BIKES - 2 different sizes, need work, you pick up, outside apartment 10A.

PEA GRAVEL - Bayport area, 2-3 yards. Ext. 2109 or 472-9199.

KITTENS - 3, born 5/18/86, to good home. 732-1697.

COFFEE CANS - one pound. Charlie, Ext. 4758.

Yard Sales

BAITING HOLLOW - Aug. 23, 10 a.m.-4 p.m., Oak Hills Community, Sound Ave., east of Wildwood State Park.

HOLBROOK - Aug. 23 + 24, 9 a.m.-3 p.m., 32 Laurel Street, off L.I. Ave., west of A&P, contents of house, tools + fabic.

OAKDALE - Aug. 23 + 24, 10 a.m.-4 p.m., 136 Roxbury Ave., contents of house. 363-6940.

NORTH SHIRLEY - for Boy Scouts, Labor Day wknd., 461 River Rd., John, Ext. 4243 or 924-3492.

Lost & Found

LOST - Rawlings baseball glove, field 1, Tuesday, Aug. 5. Bob Chanda, Ext. 3499.

LOST - Igloo playmate cooler, red, at tennis court #6, Tuesday, Aug. 12. Paul, Ext. 5287.

LOST - sunglasses, Field 5, Thursday, Aug. 14. Pat, Ext. 7192.

Car Pools

BABYLON - 2 riders looking to join or form car pool. Mike, Ext. 2705.

MASTIC - need ride to & from work, 8:30 a.m.-5:00 p.m., can be flexible, will pay, 6 blocks off Montauk Hwy. 395-3963 after 6:00 p.m.

PATCHOGUE - van pool, seat open, leave name & number. Ext. 4669.

Real Estate

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

For Rent

HILTON HEAD, S.C. - 2 bdrm. condo, sleeps 6, many extras, beach, pool, tennis, golf, fall special, Lab employees & families only. $300/wk. 585-9149.

SHOREHAM VILLAGE - mint secluded cottage on landscaped acre, close to beach & tennis, has f/p & piano, seasonal, Oct.-May, $750/mo. 744-2836.

SHIRLEY - 2 rm. apt. w/full bath, walk to beach, $385 incl. util. 744-2821.

YAPHANK - priv., spacious, 3 bdrm. ranch, den, f/p, deck, 1½ acres, avail. 9/15, $900. 924-4872.

SETAUKET - partially furn., 4 bdrm., 2½ baths, next to U. Hospital, avail. Sept. 1, 1986 to Aug. 13, 1987. Ext. 3885 or 751-5849 after 8 p.m.

24' WILDERNESS TRAVEL TRAILER - fully self contained, will tow to location, $150/wknd., $250/wk. Chris, Ext. 4028 or 399-3732.

YAPHANK - 2 bdrm. ranch, f/p, breezeway, attached gar. Ext. 7516.

BELLPORT VILLAGE - 3 bdrm. furnished house, available Sept., walk to school and shops. Ext. 3784 or 286-0925.

WADING RIVER - 3 room furnished apt., priv. ent., near beach, heat, elec. & cablevision included, sunny rural area, 1 month sec., ideal for single male, $450/mo. 929-8722.

E. PATCHOGUE - S. of S. Country Rd., 2nd fl. apt., 2 bdrm., l/r, eik, priv. ent., avail. Oct. 1, $450/mo. + util., no pets. Walt, Ext. 2907 or 698-0576.

For Sale

RIDGE - No. of Rte. 25, 1.12 acre plot, 100+x400+, level, 80% cleared, 20% wooded, in estb. quiet locale, $47,900. 924-3236.

SHOREHAM NORTH - 4 bdrm., Colonial, 2½ baths, den, f/p, bsmt., fenced, patio formal dining rm., $179,000. 744-1750.

MASTIC BEACH - frame house w/2 bdrm., l/r, eik, full bath, 80x100 plot, $63,500. 744-2821.

AQUEBOGUE - new 3 bdrm. ranch, 2 full baths, l/r, dining rm., kitchen, mudroom, town water, gar., full bsmt., ½ acre, close to golf, parks & boating. $133,000. Tim, 727-7741.

UPSTATE NEW YORK - Granville, near ski areas, 16 acres-6 meadow, 10 wooded, seasonal stream, 600 ft. front on country road, electricity. $16,000. 603-826-5673.

MORICHES/MASTIC - waterfront, 6 rm. ranch w/view of Moriches Bay-Forge River, quiet, 1/3 acre, detached studio apt., excel. cond., asking $150,000. 281-4430.

Wanted

HUB CAPS - or wheel covers, set of 4, 14", reas. Ext. 4987 or 698-7322.

WINTER POOL COVER - for 18' round pool, reas. Bob, Ext. 2964.

HOUSE TO SIT - free, responsible, experienced, caring, reliable, any period after Sept. 2, Jack Allentuck, Ext, 2412.

ITEMS - for Boy Scout yard sale, Labor Day wknd. John, Ext. 4243 or 924-3482.

HOUSE - to rent, Bellport or nearby, caring tenant. Bill, Ext. 2378.

RIM - 14" for GM wheel w/disc brake. Morris, Ext. 4192.

VENDORS - for crafts/flea market, sponsored by St. Luke's Episcopal Church, Bohemia. 598-2598.

HOUSEMATE - small two bdrm. house in Hampton Bays, $250/mo. + ½ util., non-smoker. Mike. Ext. 4417 or 728-5033.

CHAINSAW - good cond.; tricycle for three-year-old. Gene, Ext. 5632.

HOUSEMATE - to share large, secluded waterfront, Mt. Sinai, with one other, 8 mo. lease, Oct. 1., $325 +, Mark, days 420-6796, eves 979-8335.

INSTALLER - installation of wood burning stove, would like estimate. 395-3963 after 5 p.m.

CONDO TO RENT - at Whispering Pines, 2 bdrm., no more than $750/mo. including utilities. Ext. 4538.

TOASTER - utility trailer, small air conditioner (for window), in good cond., reas. Walt, Ext. 2907 or 698-0576 after 6 p.m.

Classified Ad Policy

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

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

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

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

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

NAME (Please Print) .....

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

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