BROOKHAVEN BULLETIN
Volume 34 - Number 17 / April 25, 1980
BROOKHAVEN NATIONAL LABORATORY

In Celebration Of The First Year

In the first year of construction, sextants 5 and 7 of the ISABELLE tunnel have been completed. This fact was noted at an informal celebration on Monday, when BNL took beneficial occupancy of the approximately 2800 feet of magnet enclosure. Among those inspecting the completed sections were (from left) Vern Witherill (ISABELLE Project Head for DOE), Edward Cohen (Managing Partner, Ammann & Whitney, Inc.), Jim Sanford (Project Head), Arthur Herman (President, A.D. Herman Construction Co., Inc.), and Parke Rohrer (Head of the ISABELLE Construction Div.). At the close of the day, a party was held for construction workers who operate the earth moving machines and erect the tunnel sections. About 100 men are employed at the ISABELLE site every day. Work on sextants 1 and 3 is now under way, and preparations are being made to start on 9 and 11.

—photos by Humphrey

Galbraith To Lecture At BNL

John Kenneth Galbraith, author of "The Affluent Society" and "The Age of Uncertainty," and one of America's most prominent economists, will present an AUI Distinguished Lecture at Brookhaven on Thursday, May 8. His talk, entitled "Economics and the Politics of Moderation," will begin at 8 p.m. in Berkner Hall.

In his lecture, Galbraith will examine both economic issues and the latest round of international crises. Long a political activist, and outspoken on political and social issues, he is expected to discuss whether the current dramatic approach to domestic affairs and foreign policy is the wisest course for the United States to take.

Galbraith is the former Paul M. Warburg Professor of Economics at Harvard University. He was born in 1908 in Ontario, Canada, but has lived in the United States since 1931. He received his Ph.D. in economics from the University of California, where he taught from 1933 to 1934. He also taught at Princeton (1939 to 1940) and at Harvard (1934 to 1939 and 1948 to 1975).

During World War II, Galbraith was Deputy Administrator of the Office of Price Administration, and principally organized the wartime system of price controls which he headed until 1943. He was a director of the U.S. Strategic Bombing Survey, held other public offices, and was for several years an editor of *Fortune*. In 1946, he was awarded the Medal of Freedom by President Truman.

Politically active, Galbraith was a strong supporter of Adlai Stevenson, John Kennedy, Eugene McCarthy, and George McGovern. He was

John Kenneth Galbraith

Chairman of the Economic Advisory Committee of the Democratic Advisory Council from 1956 to 1960, and later became Chairman of Americans for Democratic Action. From 1961 to 1963, he served as Ambassador of the United States to India.

His many books include "The Great Crash, 1929," "The Affluent Society," "The New Industrial State," "The Age of Uncertainty," "The Nature of Mass Poverty," and his most recent volume, "Annals of an Abiding Liberal." His technical articles cover agricultural economics, price policy, economic organization and fiscal policy, and he has written about other subjects ranging from politics to painting. Galbraith's thirteen-part series for the BBC, "The Age of Uncertainty," was written and narrated by him and was shown in countries all over the world.

The lecture is free and open to the public.

New Panels On Solar Horizon

For years solar technology was considered one of those good ideas that was either just too expensive or too impractical for mass use by consumers. But BNL's Solar Technology Group may be in a position to revolutionize the fragile solar heating industry by creating an inexpensive flat-plate collector made with light weight materials.

According to William Wilhelm, the Principal Investigator for the DOE funded project, and John Andrews, the group leader, the difficulty with providing solar energy for residential use is reducing the price of collecting solar energy so that it is competitive with other energy sources like oil.

"Manufacturing cost as low as one dollar per square foot."

The solar collector being developed by Wilhelm at BNL is designed to have an installation cost of about five dollars per square foot (many times better than existing collectors), with a manufacturing cost as low as one dollar per square foot. This low cost is accomplished with the use of very thin plastic and metal materials combined in such a way that their performance is not compromised and durability is still assured.

In the window portion of the solar collector special plastic films are being studied which, in spite of their modest thickness (0.004 of an inch), have superior strength. The absorber portion, the part that converts the sun's rays into thermal energy, is also made of very thin materials. It is composed of an envelope made with a plastic coated aluminum foil channeled so uniform wetting of the inner surface can take place.

Perhaps the most important breakthrough for Wilhelm and John Andrews, was the use of "gravity feeding" as a means to bring water through the collector to be heated. By using gravity as the method of liquid transfer the absorber envelope is allowed to operate without elevated pressure. This reduced pressure mode of operation (present collectors are pressured) gives Wilhelm an almost pressure free system, and adds to the longevity of the components.

Another advantage of a gravity feed collector, said Wilhelm, is that plain water can be used without the addition of expensive anti-freeze. This is because the water drains completely from the collector when it's not running. The expandable absorber also protects any residual water from causing freeze damage to the collector.

"The item must be salable."

To arrive at this design it was important to address the proper economics. Wilhelm maintains creating solar equipment without first establishing valid economic restraints (so the item will be salable) is a distortion of the product's practicality. With this in mind Wilhelm's team set out to develop a collector that would not only be more efficient, but would also permit competition with existing fuels, and allow a sufficient enough profit to stimulate a mass solar industry.

To do that, the amount of energy put out by solar collectors has to be related in energy units just as oil is expressed in terms of energy per gallon. Thus, with this value, the yield and cost of several energy systems can be compared to active solar. Second, designs had to fit a relatively short "payback period" – the time required for a solar user to be on an even cash level with those using other systems.

Presently, payback periods for active solar systems are between 15 to 30 years – just too long to appeal to a mass market (the average in competitive industries today is three to five years). Wilhelm settled on a maximum payback period of eight years, without subsidies.

"10 million square feet of equivalent collector could be sent in one freight car."

For the Solar Technology Group to meet the stringent cost restrictions they placed on their project, the use of thin plastic films was necessary. However, they offer additional advantages as well; such as enhanced heat transfer, easy installation, and reduced weight. The total weight for a 20 square foot panel is projected to be 10 pounds; present collectors weigh as much as 160 pounds. Wilhelm has also designed a series of plastic hinges that will connect the panels like an accordion. This will permit one man to install 100 square

(Continued on page 2)

Mort Rosen

Solar panels of the future might be constructed of thin plastic films that not only demonstrate strength and durability – but will be available at low cost.

Steer Her Full And By

Jim Lofstrand (DEE) has been sailing as long as he can remember. In fact, he was almost born on a sailboat on Lake Michigan. So, it is not so far-fetched that at 12:01 a.m. on Saturday, May 31, he had his wife, Lesley, will set sail from Greenport on their boat, the Game Fish, on a two-year odyssey.

That's right – two years. Lofstrand is the first to agree that it is an ambitious undertaking. Because of all that is involved, they have been saving their money and planning the trip for almost four years.

According to nautical lore, it is bad luck to set sail on a Friday, so they will take off as soon as Saturday rolls around, and go with the tide to Montauk. From there, they will head for Bermuda, their first port of call, a distance of 610 miles. Three weeks after that, they expect to be in the Azores, and by late July they should be docking in England.

But getting to England is just the first leg of their journey. Lesley Lofstrand is English and she will stay with her family while Jim, his father, and Bob Weiser (DEE) both of whom will fly over from the U.S., will sail in the North Sea and the Baltic until September. The Lofstrands will spend the winter in England.

In the spring of 1981 they will take off again, this time through the canals of France between LeHavre and Marseilles, with visits to Corsica, Sardinia and Malta. Then they will sail into the Mediterranean with stops in Greece, Turkey and Egypt.

By September, if " things look hot" in that part of the world, Jim says they will sail back through the Mediterranean to Spain and, via the Canary Islands, make their way to the Caribbean where they will stay until the spring of 1982.

If the political situation is stable, the alternative plan is to sail through the Suez Canal, the Red Sea, across the Indian Ocean and back, "the wrong way" to the West Coast of the U.S.

Experience and confidence in one's vessel are prerequisites for such a venture. And the Lofstrands have both.

You might say Jim started sailing even before he was born. His mother was 8½ months pregnant with him when his father took her sailing on Lake Michigan in October. Although she never went out on the boat again, he has been sailing ever since. He has raced on the Great Lakes, in Florida, on the West Coast and between Victoria, B.C. and Hawaii. Last year, he crewed with Bill Bornstein (DEE) and Phil Connolly (Physics) on a boat which placed first in the annual Round – Long Island Race. He figures he has done about 10,000 miles in offshore sailing, but the Atlantic run will be a first for him. Although Lesley's experience is less extensive than Jim's she is a marine archaeologist and so no stranger to the water.

The boat is a 33′ Sloop-rigged Vanguard, designed as an ocean racer by Philip Rhodes and built in 1964. Lofstrand chose this particular vessel because it is a sister ship to one on which he served as first mate for two years in the Pacific. He has great confidence in it.

Spending a lot of time confined to the boat is nothing new to the Lofstrands. They have been living on the Game Fish for two years. It is moored in Mt. Sinai Harbor and they dinghy in to work every morning. In cold weather, Lofstrand says they've been fortunate in being able to house-sit for friends who want someone to look after their house while they are elsewhere.

Provisions must be carefully planned. Initially, they will bring one-third freeze dried products, one-third canned goods and one-third fresh produce. Eggs, for instance, will keep about three weeks if the carton is turned every three days, Jim says. Apparently, eggs spoil when the yolk touches the shell, so the trick is to keep them suspended. They will replenish their supplies in Bermuda and again in the Azores. While Lesley is planning the meals, they will share the cooking.

Jim and Lesley Lofstrand on their boat, Game Fish, which will take them to several parts of the world in the next two years. The boat's name was taken from a line in an e.e.cummings' poem which reads, "Only The Game Fish Swims Upstream." —photo by Sawka

The Game Fish will carry ship-to-shore radio, as well as an amateur radio station. Lesley is a ham radio operator and arrangements have been made with friends to handle the Lofstrands' radio traffic. They expect to log in once a day and give their position.

The boat is equipped with both mechanical and electronic self-steering systems. They will use these during daylight hours, but will alternate watches to steer at night. A diesel engine will generate electricity to operate the radio and autopilot. The Game Fish will be highly visible, with masthead running lights passive radar reflector and a high-intensity anti-collision strobe light.

Jim and Lesley met in Greece in 1975 when they were working on a National Geographic project, he as skipper of the research vessel and she as a marine archaeologist. Almost immediately after their marriage, they started plotting how they could get back there again. One of the things they will do when they reach that part of the world is to explore five shipwrecks that Lesley wants to survey. They are both accomplished divers.

Lofstrand expects the two-year venture to cost them in the neighborhood of $40,000. If it were just a question of taking a trip, he says, "we could have gone on the Concorde twelve times first class." But adventure is what they want, and sailing is the way they want to go. All the BNL sailors and the landlubbers wish them well.

Solar Panel (Cont'd)

feet of collector at one time – without special equipment – just as easy as putting up roof shingle.

"Shipping the basic materials in large rolls will also contribute to the low cost," said Wilhelm. "For instance, 10 million square feet of equivalent collector could be sent in one freight car."

While Wilhelm may tend to dwell on the marketability of his new collectors, and the savings they will produce, he is aware of the artistic expression that goes into engineering a good design.

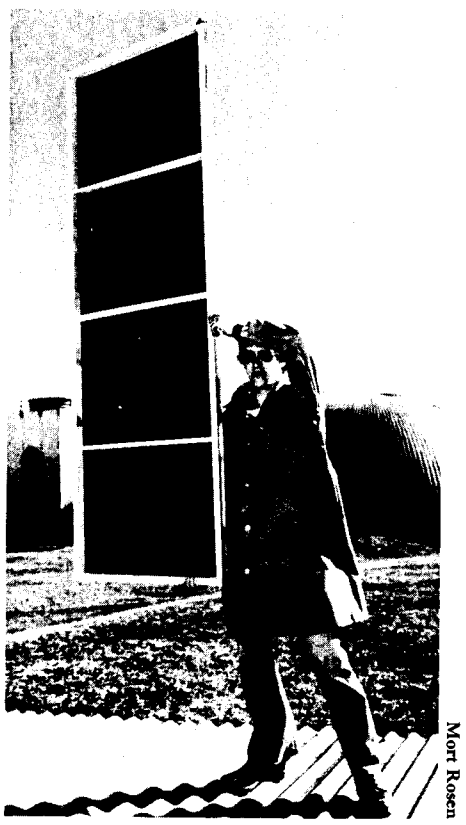
"Elegance of design is like good poetry," he said. "The most should be expressed in the least amount of words. The quality of a design is measured by the simplest form that can be achieved consistent with the function to be performed."

Wilhelm worked for several years in the bubble chamber as a development engineer before becoming involved in solar energy five years ago.

"I enjoy what I'm doing because I want to contribute to a technology that demonstrates a practical application to our needs, and has a positive effect on man's survival."

Despite receiving a good response from industry, Wilhelm cautions that there is still a considerable amount of work to be accomplished. The collector materials are a critical factor in the success of the designs and, he maintains, there is plenty of room for improvement.

The type of materials Wilhelm is always on the lookout for must not only be light weight, and strong, but should also have the ability to last for



Mort Rosen

Dave Hansen and light weight solar panel

ten years or longer. In the future materials like polyacrylomtrile may offer even greater advantages in high performance and lower costs than those available today. Even though he doesn't have all the answers yet, Wilhelm is convinced that affordable solar energy is just down the road.

"Because industry requires a great deal of capital to explore the production of new materials, it will take considerable effort to communicate the significance of this low cost approach," said Wilhelm. "Time will be the real test of it's success."

—Jerry Mikorenda

Flash!

George Vineyard has received the following telegram from SLAC Director Wolfgang Panofsky: "An 8 GeV electron beam was stored in the SLAC-LBL storage ring PEP early in the morning of Monday, April 21. A fraction of a milliampere was stored with a lifetime of one-half minute before operations were interrupted for a scheduled shutdown.

"Construction of the PEP facility at SLAC by a joint LBL-SLAC design team began formally with full Congressional authorization in November 1976. Ground breaking took place in June 1977, and commissioning began April 1, 1980. The storge ring was completed within the authorized 1978 million dollar budget."

Brookhaven offers heartiest congratulations to its sister laboratory.

In Appreciation

The Brookhaven OXFAM Committee for Cambodian Famine Relief wishes to thank Lab employees and their families for their support in terms of contributions and attendance at our fund-raising films. We also wish to thank the Upton Branch of Bankers Trust for allowing us to place a cannister in the bank, and express our sincere appreciation to Dr. Vineyard and the Laboratory administration for their help.

So far we have raised over $1600 towards our $5000 goal. Our next major activity will be a garage sale in late May, followed by more films in the summer. We urgently need people to help us in our efforts to help ship food and seeds to save more Cambodians from starvation. If you have time, and wish to help, please contact Chip Balzer, Ext. 2256 or Tony Fainberg, Ext. 2920.

Benefit Records Mailed Next Week

The annual statement of each employee's present insurance and retirement benefits will be mailed next week to the home address of all regular full-time and eligible part-time employees.

The statement reflects each individual's various group insurance coverages (premiums, beneficiaries, disability benefits), and AUI and employee contributions (including current allocation) to the retirement plan.

The purpose of this statement is to provide employees and their families with a better understanding of their AUI benefits and to insure that their insurance coverages and beneficiaries are correct and up-to-date.

In order to reduce cost, the statements are being mailed at the third class bulk rate charge. Therefore, some employees may experience a delay in receiving their statements.

Correction

In the article "Spotlight: Ling-Lie Wang" published in last week's *Bulletin*, references to Maurice Goldhaber were misleading, to say the least. The term "blood hunt physics" attributed to him should have read "bloodhound.' And, as far as we know, there is no such person as Carl Dover Goldhaber. A comma was omitted between Dover and Goldhaber.

Daylight Saving Time goes into effect at 2 a.m. on Sunday, April 27.

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Service Awards

The following employees received service awards during the month of April.

Twenty-Five Years

Dorothy C. Berg.....Ph. & Gr. Arts
Benjamin C. Frazer.....Physics

Twenty Years

Robert L. Dilg.....Plant Engrg.
Bernice K. Johnson.....Medical
Gary E. McGovern.....Biology
Ira W. Still, Jr......Instrumentation
John C. Valek.....Accelerator
John B. Waskewicz.....Biology
Michael A. Zguris.....Accelerator

Ten Years

Kenneth P. Wokosky.....Accelerator

Women In Science

The Women in Science Association will meet on May 6, at noon, in the conference room of the National Nuclear Data Center, Bldg. 197D. Coffee and tea will be provided, but bring your own lunch. Building representatives are requested to call Rosemary Cohen, ext. 3480, by May 2, and let her know how many people will be attending from their departments.

Gail Williams, Office of Scientific Personnel, will give a talk on "Programs for Re-entry of Women Scientists."

Cafeteria Menu
Week Ending May 2, 1980

Monday, April 28		
Chicken vegetable soup	(cup)	.40
	(bowl)	.50
Roast sirloin of beef & 1 veg.		1.50
Scrambled eggs, sausage & fries		1.35
Hot Deli - Roasted turkey breast	(bread)	1.40
	(roll)	1.50
Tuesday, April 29		
Beef noodle soup	(cup)	.40
	(bowl)	.50
Roasted chicken w/stuffing		1.45
Beef liver & onions w/1 veg.		1.35
Hot Deli - Barbequed beef	(bread)	1.40
	(roll)	1.50
Wednesday, April 30		
Cream of tomato soup	(cup)	.45
	(bowl)	.55
Broiled filet & 1 veg.		1.45
Chopped steak & 1 veg.		1.35
Hot Deli - Grilled Reuben		1.45
Thursday, May 1		
Navy bean soup	(cup)	.40
	(bowl)	.50
Manicotti & 1 veg.		1.35
Braised beef & 1 veg.		1.50
Hot Deli - Smoked baked ham	(bread)	1.40
	(roll)	1.50
Friday, May 2		
Mussel chowder	(cup)	.45
	(bowl)	.55
White clam sauce over sea shells		1.35
Breaded pork chop w/applesauce & 1 veg.		1.50
Hot Deli - Fried filet hero		1.45

Softball Note

The two new softball fields at the Recreation Park are not ready for use. Please use the other fields for practice games.

Gym Closing

The gymnasium will be closed to all activity during the daytime hours on Thursday, May 1. Normal schedule will resume at 5:00 p.m.

This closing will not affect usage of the locker/shower rooms or the swimming pool.

Radio Club

There will be a meeting of the BNL Radio Club at noon, Wednesday April 30, in Room A at Berkner Hall. Topics to be discussed include the acquisition of a two meter repeater, and payment of 1980 dues. All members are urged to attend. For information call Bob Cook at ext. 4592.

Arrivals & Departures

Arrivals

Roy Garcia.....Accelerator
William M. Zeman.....Accelerator
Hagai Zmora.....Chemistry

Departures

Paul R. Bender.....Medical
Robert W. Garber.....Energy & Env.
Sandra L. Garber.....Nuclear Energy

Soccer

The soccer group will move to outdoor play on Monday, April 28, at 5:00 p.m. There will be pickup games and all those interested are welcome to come.

The soccer field is located at the eastern end of Brookhaven Avenue in the BERA Recreation Park.

Bowling

Green League

The Sparks are still in first place as they took 11 from the Freon Loaders. J. Cockrane had a 226. The Blue Jays won 8 from the Old Timers II and the Pinball Wizards took 8 from the Phoubars. The Light Source won 9½ from the Trouble Shooters with A. Almasy bowling a 233.

Blue & Gold League

The Aquanauts fell 1 point out of first place even with the efforts of Tom Romano's 232/568 series and Mickey Haller's 181. Joe Sheehan scored a 211/578 and Rick Murgatroyd 217/552 series. Mary Scheidet pulled her team to victory with a 170/152. Sue Perri rolled a 166, Peg Taylor 161, Ruth Sheehan 158, Audrey Bangel 151 and Lil Cahill 150.

Pink League

Renie Rosati had two good games of 172/166 as did Pat Jencius with 182/164. Other good games were bowled by Mary-Grace Meier 183, Deb Johnson 169, Marie Grahn 163, Joyce Nicholsen 151 and Maria Apelskog 133.

Red League

The Designers won 11-0 over This Isa Team. A great night for A. Pinelli (206/203/209) for a 618-609 series. T. Iarocci bowled a 206/613 gross. The 76'ers took the Sandbaggers 8-3. J. Petro (220) grossed 631, M. McKenna (210) 617 and C. Bohnenblusch 600. The Old Timers won 8-3 over the Strangers. L. Musso (202) grossed 656, J. Walker 605. The Freon Loaders lost 11 to the Sparks. F. Hohmann (224) grossed 622.

Purple & White League

High game for the men was Ken Asselta's 253 and for the women, Joyce Pinelli's 228. Jim Griffin rolled high series for the men with games of 209/188/191-588 and Pat Manzella for the women with 208/181/187-576. Other good games were bowled by Carl Murray 201, Ben Belligan 206, Nate Carter 203, Ed Meier 212, Bob Brown 204, Mary Grace Meier 185/186, Marge Belligan 184, Lynn Boyd 180.

Tournament News

The Brookhaven team is doing very well (still on the plus side in incentive) and the last night hopefully will put them higher in the standings.

Volleyball

Open League
Championship Series 1979-1980

Division A:

Moles swept Spikers
15–9 16–14 15–12

Division B:

Over-the-Hill-Gang defeated the Players Pool 21–12 21–7 21–13 after the latter had beaten the Monday Terrors in a semi-final playoff.

Mixed League
Standings April 14

A.	No Names	11– 1
	High Society	10– 2
	Nuts & Bolts	8– 4
	Family Affair	4– 8
	Thrints	2–10
	Deegenerates	1–11
B:	Diamonds	10– 2
	Leftovers	8– 4
	Monday Night Live	7– 5
	Nads	7– 5
	Le Mufs	4– 8
	Underalls	0–12

NYC Train Trip

The Hospitality Committee is planning a group railroad trip to the city on Wednesday, May 7. Departure will be at 7:55 a.m. from the Patchogue LIRR station. Round-trip fare for adults is $2.45, 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,** May 1. Make checks payable to "Brookhaven National Laboratory." Your ticket will be given to you on the train. Refunds will be made only if cancellations are received by the Friday preceding the scheduled trip.

Swimming Pool

Admission Fees and Schedule

Thursday, May 1, 1980, marks the start of a new four-month season at the swimming pool. Season tickets will be on sale at the pool during open hours beginning on that day.

Fees:

Season Tickets – valid 5/1–8/31/80
(season ticket fees are not prorated)

Individual	$20.00
Family	30.00

Daily Admissions – effective 5/1/80

Employee/Family Member	$1.25
Guest	1.75

Schedule:

Monday through Friday
11:00 a.m. to 1:30 p.m. – employees only
5:00 p.m. to 9:30 p.m. – employees families/guests

Saturday and Sunday
1:00 pm. to 6:00 p.m. – employees/families/guests

The pool is closed on all Laboratory holidays.

Guest Ruling:

One guest per employee is permitted at the pool. Advance arrangements for additional guests (but not more than five any one time) may be made at the Recreation Office.

R/C Aircraft Club

A lot has happened since our last meeting. The budget was submitted to BERA, the executive board has approved a new field (a real improvement) and the weather is getting better for flying. We have been waiting for the films from AMA before scheduling the next meeting but they won't give us a definite date. Therefore, we will have a meeting Thursday, May 1 at Berkner Hall, Room D at 12:00. For information, call Jim Durnan, Ext. 2485.

In Rehearsal

Doug Humphrey

Joseph Indusi (Judge Gaffney), Jane Love (Veta Louise Simmons), and Sandra Lane (Myrtle Mae Simmons) in a scene from "HARVEY," the BERA Theater Group's next production. Performances will be on May 2, 9, 10 at 8:30 p.m. and also at 2:00 p.m. on May 3 in Berkner Hall. Tickets are $3.00 for adults, $2.00 for Sr. Citizens, and Students under 18 years of age. For ticket reservations call Liz Russell, Ext. 3940.

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.

LABORATORY RECRUITMENT: Opportunity, for present Laboratory employees.

1317. SYSTEMS PROGRAMMER POSITION (Technical Services) - Requires a bachelor's degree in computer science or mathematics. Will assist in the planning, organizing and controlling of the computer software operating systems. Responsibilities will include writing specialized programs for IBM 360 and Hewlett Packard hardware to ensure efficient and effective operation of the system. Excellent writing skills are required. Administrative Systems and Data Processing Division.

1318. TECHNICAL POSITION - Requires experience working with large computer systems. Duties will include computer and peripheral equipment maintenance, and prototype equipment check-out. Ability to use software diagnostic tools is required. Some knowledge of programming is useful. Reposting of Job No. 1154. Physics Department.

1319. SECRETARIAL POSITION - Requires AAS degree in secretarial science or equivalent experience performing diverse secretarial duties with ability to take shorthand. Will assist with all aspects of procurement; duties will include organizing, reviewing and expediting verbal and written communications and records. Contracts and Procurement Division.

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

1320. GEOLOGY ASSOCIATE - Requires BS or equivalent in geology with experience in experimental petrology and minerology. Familiarity with use of petrographic microscopes and x-ray diffraction equipment is desirable. Will assist in the evaluation of synthetic rocks for use in nuclear waste encapsulation. Department of Nuclear Energy.

1321. PATROL OFFICER - Requires AAS in criminal justice or equivalent experience performing diverse security duties for a large organization. Excellent communication skills are necessary as well as ability to work shifts. Will participate in comprehensive training program in order to become knowledgeable of site and police procedures. Safety and Environmental Protection Division.

1322. SENIOR STATIONARY ENGINEER - Requires demonstrated experience in the maintenance, repair, and operation of high pressure boilers firing #6 fuel oil. Current stationary or marine engineer license is highly desirable. Plant Engineering Division.

Autos & Auto Supplies

75 PONTIAC FIREBIRD - 350 eng, 2 bbl carb, r/h, ps/pb, a/c, AM/FM-8 trk, brown/brown, excel cond. Robert, 475-2058.

71 VW SQUAREBACK - has blown eng, will sell parts or whole car; tires, (2) F78-15 w/w, $5 ea; (2) 078-14 w/w, $5 ea. 363-6597.

68 VW - oldie but goldie, new brakes, tires, muffler, heater, running excellent. Asking $500. Neils, Ext. 4124.

67 CHEVY STA WGN - 6 cyl, stick, good running cond. $225. Frank, Ext. 2022, 281-3460.

74 CHEVY BELAIR WGN - ps/pb, new tires. $500. 981-4681 days, 981-3465 after 6.

65 IMPALA WGN - sm V8, p/b, roof rack, runs well. $195. Tony, 399-2816 after 6.

74 KAWASAKI - 175cc dirt, rebuilt eng/clutch, racing shocks, CDI ignition, very good cond. $375. Mike, 929-6177.

76 LINCOLN MARK IV - excel cond, options, silver/red int. Sacrifice, $3500. Bux. 549-8811, home 981-1327.

78 NOVA - 6 cyl, a/t, a/c, ps/pb, mint cond, 23,000 mi, must sell. George, Ext. 2982, 588-1713.

70 DODGE VAN - finished int, roof vents, bed, AM/FM tape deck, runs well, clean. 277-2671 after 6.

77 LINCOLN CONTINENTAL - Designer series, loaded. $6800. 924-8534.

78 CAMARO LT - 350, 4 spd, ps/pb, blk/red int, T-roof, rear spoiler, posi rear, pinstriping, AM/FM-8 trk, 60 radials. $5500. Gary, 281-3850.

75 IMPALA STA WGN - very good cond. $1400. Ext. 3134/2432.

69 CHEVY IMPALA - V8, ps/pb, rusty but runs. $200. Bill, Ext. 3996, 281-1136 eves.

76 VW VAN - 9 psgr. Jim, Ext. 2968, 744-5034 eves.

4 GOODYEAR TIRES - D78-14 w/w, less than 2K mi. $25 ea or all/$95. Ext. 2492.

71 GREMLIN - excel cond & gas mi. $500. 281-5498.

74 LE SABRE LUXUS CONV - a/t, ps/pb, p/w, a/c, AM/FM rear defrost. Asking $2500. Ext. 4113, 289-0753.

77 CAMARO - ps/pb, p/w, a/c, AM/FM stereo, 305-V8, excel cond. Pat, Ext. 4173.

BRAKE DRUMS - set of 4, refinished, fit Dart, Valiant, other Chrysler cars; oil filters, STP 1, fit Chrysler 225 cid & others. Ext. 2251.

79 YAMAHA 650 - Special II, 500 mi, 50 mpg, windshield, carry case, excel. $1995. John, Ext. 4255, 929-4450.

TIRES - (4) Mich radials, very good rubber. $35 ea. Warren, Ext. 3464, 924-7552.

72 FORD TORINO STA WGN - 91,000 mi, 302-V8, std trans, good gas mi. $575. 281-8306.

73 CHEVY IMPLA - 9 psgr wgn, a/c, AM/FM, a/t, runs well. $900. 286-1108 after 6.

74 MONTE CARLO LANDAU - excel cond. $1700. Frank, Ext. 3898.

NEW 350 CHEVY HEAD - compl. $25. Owen, Ext. 3082, 286-1886.

68 VW BUG - healthy major components, needs muff & embellishments. Best offer. George, Ext. 3636, 759-1328 after 7.

72 CHEVY STA WGN - ps/pb, good cond, new brakes/batt/tires (2). Price negotiable. Len, Ext. 4487.

75 TOYOTA SR5 PICKUP - 46,000 mi, 5 spd, AM/FM cassette, cap, excel cond. 286-0372.

75 CHEVY CAMARO - excel cond, 3 spd stick, p/s, new steel belted radials, AM/FM, fully gauged. $2800. 878-9541.

74 CHRYSLER NEWPORT - 4 dr, good cond, orig owner, ps/pb, a/c, vinyl top, reg gas. $1650. 281-7663.

Boats & Marine Supplies

MISC MARINE HDWRE - shackles, pulleys, oar locks, snap swivels, 12" buoy; anchors, Danforth #2-½ S w/chain, $9; 10 lb mushroom, $7.50; 10 lb yachtmans, $15. B. Espensen, Ext. 3992, 298-4172.

115 HP EVINRUDE - excel cond, low hrs, $700; 28 hp Evinrude, good for parts, $50. Bob, Ext. 3309.

16' LONE STAR - fiberglass runabout, heavy duty tilt trailer, both good cond. $800. Jim, Ext. 4502.

14.5' MFG - w/1975 25 hp Evinrude, gas tank & misc equipment. $650. Steve, Ext. 2019, 744-0763.

4-MAN RUBBER RAFT - excel, $60; elec fishing motor, new, $50. 666-4215 after 6.

14' ALUM BOAT - w/7-½ hp Mercury, like new. $550. 928-6944.

18 HP EVINRUDE - Fastwin, excel cond, must sell. $250. C. Brockner, 734-5343.

16' GARVEY TYPE SKIFF - good cond, navy top, side center console, steering wheel & cable. 325-0447 after 5:30.

15 ' STARCRAFT RUNABOUT - 33 Evinrude elec start, trailer, extras. $450 firm. Andy, Ext. 3514.

1972 WELLCRAFT V-20 - 165 hp OMC I/O, radio, 18' antenna, new full canvas, new seats, new depth finder, very clean. Ext. 2599, 929-4967.

HEATH FLASHING DEPTH GAUGE - used 2 yrs, 60 & 240 ranges, excel cond. $50. Ext. 2610, 744-5709.

19' CHRISCRAFT CRUISER - 4 cyl inboard, plywood, navy top, bunks, head, galley, needs paint & 6V batt. $850. Adams, Ext. 2011.

12' SKIFF - fits car roof, ideal for pond or lake, good cond. 325-0447 after 5.

Yard Sales

SHIRLEY - 2 Lama Drive, 4/26-4/27, outboard engs, dirt bikes, lawnmowers, furn, clothing, baby needs. Ext. 4810.

MEDFORD - corner N. Ocean Ave. & Peconic Ave, April 25-26, 10-4. Ext. 2021.

MANORVILLE - Halsey Manor Rd, April 25-26-27, group sale, tools, furn, household, garden supplies.

CENTER MORICHES - 22 Union Ave, Sat Apr 26, furn, marine items, plus a potpourri of goodies. Ext. 4058.

Miscellaneous

ROGERS SNARE DRUM - $30; Les Paul junior guitar, $275; 6 string acoustic Gretsch guitar, $25. 289-8565.

BICYCLE - Ross 20" girl's, 3 spd, banana seat, excel cond. $75. HR3-9223.

MEN'S SI BOOTS - Caber, used only once, size 11. $35. Bill, Ext. 4173, 929-3029.

DOG - part shepherd, 1 yr old, male, trained, good w/children, needs lots of rm. 281-4595 after 6.

15" SCOTTY TRAILER - self cont, sleeps 5, awning, good cond. $900. Pete, Ext. 3868/4574, 878-1225.

BUFFET - Danish mod, 5'L, 36"W, 30"H, walnut wood, great for storage. $150 firm. Ext. 4532, 277-4091.

FISH TANK - 15 gal, compl setup incl stand. $40. Ext. 2611, 751-3702.

LAB-YELLOW PUP - male, champion sired, shots, wormed, beautiful, AKC. $150. M. Kavioni, 399-5095.

DIGITAL TACHOMETER - $30; 500 receiving tubes, $500; stereo watt meter, $10. Steve, Ext. 4613.

CASEMENT AIR COND - 6000 BTU. $70. Ext. 4363.

KITCHEN SET - thick hardwood tresel table & 2 benches, table top needs refinishing. $125. 281-0360.

RIDING MOWER - Sears 26" 6 hp. $150. Bob, Ext. 4778.

TRIPLE BUNK BEDS - w/springs, maple finish, good cond. $50/all. 727-0552.

MOTHER'S DAY PILLOWS - order now. Sharon, Ext. 3793, 878-2591 eves.

CONSOLE COLOR TV - Zenith 25". $350. 281-0804 eves.

MOUNTAIN BOOTS - heavy duty, Galibier Desmaison, good cond, $30; Rei frame pack, lg 5 zippered pockets, very good, $35. Rau, Ext. 3830.

OLD FLAX SPINNING WHEEL - good working cond. $225. 473-5585.

GANG MOWER - 60" width, 3-reels, $50; jigsaw, Sears 18" w/motor & stand, $45. Tom, Ext. 2613, 281-4080.

USED VENDING MACHINES - cigarette & candy. Cafeteria, Ext. 3541.

AIR COND - 6000 BTU Sears, 115V, 7.5A, window unit, $65; dehumid & air purifier, Emerson Mod DB3, 110V, 4.8 amps, $20. Charlie, Ext. 4227.

FLUTE - Gemeinhart, 1 yr old, excel cond, open hole, solid silver head joint, extra B foot. $200. 473-1157.

ALUM HUNTING ARROWS - 31", 50-60 lbs w/broadheads, $20/doz; cedar arrows, $8/doz; compound hunting bow, Bear Polar LTD, excel cond, $100. Stan, Ext. 3284, 286-1062.

WROUGHT IRON KITCHEN SET - very good cond, lg table w/leaf, 4 chairs. 475-2885 after 6.

DOG GROOMING SUPPLIES - chokes, wholesale; (2) 14" tire rims; vacuum cleaner, $65; children's books. Ext. 7772.

COLEMAN STOVE - 3 burners, good cond. $25. Frank, Ext. 4839, 732-4224.

PROJECTOR BULBS - CAL, 4 pin base, 300w & CWD 4 pin base, 300w, $1.50 ea; CZA/CZB 4 pin base, 500w, $2 ea; all new-in boxes, retail over $5 ea; need DEK bulbs for Kodak Carousel. H. Sauter, Ext. 3783.

FREEZER - 13.2 cu ft Admiral upright, frost free, excel cond. $125. AT6-0077.

BICYCLE - 20" girl's Schwinn, $25. Ext. 4532, 277-4091.

MOVING - must sell GE washer, 18 lb cap, like new still under warranty. Best offer. Ann, Ext. 4959.

PLANT SALE - Medical lobby, Friday 4/25. C. Hull, Ext. 3655, 281-2002.

HP-97 CALCULATOR - brand new. $500. Frank, Ext. 2482.

ELEC HAMMER - Milwaukee #5382 heavy duty, new cond, still in box, w/extras. $275. 924-8842.

WILSON GOLF CLUB - 2W41, bag, putter rarely used, like new. $30. Ext. 4410, 924-0581.

MEN'S BICYCLE - Schwinn Le Tour 10 spd, all alloy components, excel cond. $150. Frank, Ext. 3898.

BABY ITEMS - like new, Peterson stroller, $12; round walker, foldable, $7; baby love infant carrier, $8; all excel. Ext. 2386, 924-3072.

MARTIN GUITAR - 00-18C model, excel cond, w/case, must sell, good for beginner. $300 firm. 821-0137.

STENOTYPE MACHINE - w/light wgt tripod, Samsonite case, like new cond. $150. Ext. 2303.

AG-1B FLASH BULBS - $125/doz. Ext. 2041.

SKI BOOTS - Caber, men's size 11, used only once. $35. Bill, Ext. 4173, 929-3029.

TURNTABLE - Pioneer direct drive semi-auto, spd adjust, 2 cart, mint cond. $100. 744-5009.

HAMMOND ORGAN - model J110 spinet Leslie 125. Asking $750. 979-6378.

CARPET - gold, high quality, used, more than 70 yds. $200. 821-0794 eves & weekends.

PING PONG TABLE - deluxe crib mattress; red carpet size 15'x10'; dinette w/4 chairs. 928-9448.

SUMP PUMP - pedestal type, stainless shaft, Sears Best, works fine. $20. M. Greene, Ext. 4033.

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

LAKE GEORGE - cottage on sheltered Indian Bay, 2 bedrms, loft, L/R cathedral ceiling, stone fp, kit, toilet, scr porch, auto well, plowed road to ski areas, easy terms mtg. 928-1020.

PORT JEFFERSON - Harbor Hills, 3-4 bedrm ranch, possible mother/daughter, wooded ⅓ + acre, fp, dead end street, financing possible, immed occupancy. $69,000. Ext. 4504, 473-1523, 928-0483.

BELLPORT SOUTH - colonial ranch, L/R, D/R, vaulted 15' ceilings, fam rm w/built-in birch bkcases & sliding doors to 30' astro-turf patio, 3 bedrms, new eik, 2-car att gar, out bldg, prof landscaping, brick ent patio, assumable 8¼% mtg ($75 tranfer cost) of $34,000. Price $52,500. 286-3732.

EAST PATCHOGUE - 4 bedrm, 2-story colonial, full bsmt, carpeting, hard wood floors, inground pool, 0.4 acre, 10 yrs old. $50,000. A. McInturff, Ext. 4845, 286-8890.

CENTRAL ISLIP NORTH - 1 acre, hi-ranch, 8 rms, sunken patio 24x28, 1½ baths, possible mother/daughter, extras. Ext. 2514, 234-5684.

MANORVILLE - 3 bedrm ranch, 1 acre, 32' country kit, cathedral ceiling, 1½ baths, appl, bsmt, gar, assumable mtg at negotiable rate. $45,000. Pete, Ext. 3868/4574, 878-1225.

BELLPORT SOUTH - walk to beach, golf, tennis & shops, beautifully planted 1 acre, garden, fruit trees, play house, excel cond 4 bedrms, 1½ baths, gas heat, city water. 286-2320.

BELLPORT VILLAGE - 3 bedrm high ranch, L/R, D/R, den, lg eik, deck, 1½ baths. $42,000. 286-8166 after 5 & weekends.

MASTIC BEACH - 3 bedrm ranch, corner lot, roofed patio, pleasant loc near water. Low 30's. 281-7531.

MASTIC BEACH - 4 bedrms, eik, form D/R, L/R w/Franklin, shed, encl porch, 160x100, walk to stores, water & schools, low taxes, Farmers 8% mtg. $28,000. 281-0360.

For Rent

3 ACRES - ideal for horse pasture, avail for spring & summer, will sow to clover & rye. For details 924-3236.

POCONOS - chalet in prvt community, tennis, riding nearby, avail by week or weekend. 289-2159 after 6.

Wanted

PIANO -sm size, good mech cond, reasonable price for church school. F. Kuehl, Ext. 4823, 588-2268.

SOMEONE KNOWLEDGEABLE - to appraise an old stamp collection. Ken, 924-3756.

RELIABLE BABYSITTER - 2 children, my home, Medford area, 8:15-5:15. 289-4708 after 6.

WATER SAFETY INSTRUCTOR - Camp Wauwepe in Wading River. 929-4555 eves only.

MEMBERS NEEDED - for food co-op in Bellport/Brookhaven/E. Patchoque area. Good food for good prices. Nancy, 281-4673.

HOUSE SITTING - or reasonable apt, married couple home from graduate school June-July-Aug. Ext. 2423.

ALCOHOL STOVE - for boat, fair to good cond. J. Sammis or N. Satterlee, Ext. 3354.

HOUSEMATE - to share 4 bedrm, 3 bath house in Coram. $155/mo + share util. 928-8379 eves.

TRUNK - for college-bound student. K. Fuchel, Ext. 4116.

TUTOR - for 1st yr H.S. Chemistry student. Colette, 744-2816 eves.

COMPUTER - used sysem or terminal; also need dehumidifier. Kevin, Ext. 4901, 924-7283.

BOAT TRAILER - 2200 lbs or over cap. 722-4679 eves.

GAS ENGINE - 3.5 hp horizontal drive, good running cond. Ext. 4660.

BABYSITTER - adult for 1 yr & 4 yr old, Mastic/Shirley area only, 5 days/wk. Ext. 7923.

HOME - for friendly 3 yr old Weimaraner thorobred dog, owner deceased. Dick, Ext. 3273.

APARTMENT TO RENT - 1bedrm, Rocky Point, Sound Beach, Miller Place area. Donna, Ext. 2907. 751-6383, eves.

Car Pools

PATCHOGUE - from Patchogue via E. Patchogue/Bellport, on-time, have opening for paying rider. Alyce, Ext. 2902.

ELMONT AREA - So. State Pkwy, looking to join or form car pool. A. Queirolo, Ext. 2072.

HUNTINGTON VICINITY - 2/3 car pool would like to increase to 5. Al, Ext. 2094.

RONKONKOMA - looking to join or form car pool, flexible, near Expwy. C. Balzer, Ext. 2256.

BLUE POINT - paying rider needs ride from Atlantic Ave near Montauk Hwy. Sue, Ext. 3163, 363-6121.

STONY BROOK VILLAGE - regular or occasional rider wanted for car pool. Dick, Ext. 4363.

VAN POOL - from Miller Place to BNL. Don, Ext. 3284.

Lost & Found

FOUND - man's watch in Chemistry Bldg. For info contact P. Davis, Ext. 4311/4399.

LOST CAT - 3 yrs old, white long-haired spayed female, 1 blue eye & 1 yellow eye. $10 reward for return. Rae, Ext. 3347, 289-0342.

LOST CAT - male yellow tiger, last seen in apt area. Ext. 3011, 4388.

LOST - 4/17, silver chain w/cross. Jayne, Ext. 7597.

FOUND - male Persian cat, young, gray, long hair, neutered, shots, also for adoption. 924-0489.

LOST - half-frame reading glasses, in AGS parking lot area. Neil, ext. 2022.

Services

AUTO REFINISHING- all areas of work performed, discount rates for sm car refinishing. Ext. 2546, 744-4047.

FRESH CLAMS - order before weekend for Monday only. $1.50/doz. Ken, Ext. 3354, 654-2831.

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

ROTOTILLING -get your garden in shape this spring, up to 900 sq ft for $15. Mark, 928-5684.

CAR WAXING - wash & wax. $20, my home or yours. Steve, Ext. 4297, 758-9048 after 6.

EXPERT SPACKLING & TAPING - Bill, 286-8185.

EXPERT HOUSE SITTING - free, Lab vicinity, after June 1. Jack, Ext. 2059.

TREES & SHRUBS PRUNED - yard & cellars cleaned; evergreen fir & spruce trees, 22"-46", you dig, 2/$7. 727-1617.

HOUSES CLEANED - professional results, reasonable rates, references. 821-9508.

ROTOTILLING - lawns & gardens, South Shore, Shirley to Oakdale area. Avg garden, $15. 286-0834.

Ads left out of this issue due to lack of space need not be re-submitted to appear in next week's issue. Please note that ads may not be more than 15 words long and must be received in the Bulletin office by 4:30 p.m. Friday, for inclusion in the following week's Bulletin.

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