BROOKHAVEN BULLETIN

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BROOKHAVEN NATIONAL LABORATORY

HFBR Back On-Line With New Sample Handling Facility

You've seen them at malls and fairs everywhere: those glass booths filled with little stuffed animals that you try to grab with remote-contol "hands."

Believe it or not, technicians at BNL's High Flux Beam Reactor (HFBR) routinely use the same kind of remote-control grabbing arms found in those games.

But instead of snatching at teddy bears, they handle radioactive metals, crystals and other materials destined for scientific experiments. And the booth isn't glass: It's made mostly of 20 tons of lead.

This kind of apparatus, called a sample-discharge facility, has been in place since the HFBR first went on-line in 1965. Over that time, it has enabled technicians to handle safely more than 7,000 samples of various materials after irradiation in the reactor's core.

But the booth didn't shield as much radiation as possible, and the facility's remote control "arms" and "hands" were always somewhat imprecise, said Joseph O'Conor, Technical Supervisor of the Reactor Division's Research Coordination Group.

In other words, had the old equipment been an arcade game, people would have walked off with fewer stuffed animals.

Joseph O'Conor, Reactor Division, at the controls of the new Sample-Discharge Facility at the High Flux Beam Reactor.

But not any more. Now that the HFBR is back on-line after a seven-month shutdown for earthquake-safety checks and modifications that ended Monday, the technicians have a newer sample-discharge facility to work with. Among other advantages, it features more precise mechanical arms for dealing with samples once they are brought out of the seven tubes, or "thimbles," that lead to the reactor core.

As well, the technicians at the facility will be shielded from radiation 10 times better than before. "The primary reason we built this was to reduce radiation exposure to people handling and working around the facility," O'Conor said.

Better Service for Users

The improved facility has been in the works for four years. Aside from its safety and precision, O'Conor said, it will also improve service for the scientists around the world and at BNL who request about 250 sample irradiations each year.

These scientists are investigating everything from the effects of radiation on metals and ceramics to the impact of different radioactive isotopes on living tissue. And their experiments all depend in some way on materials irradiated in a reactor such as the HFBR.

The new, 57,000-pound sample-discharge facility, also known as a "cave," is about the size of a large office desk on extra-high legs. Embedded in its 7-inch-thick lead and steel walls are three windows of 16-

(continued on page 2)

Reports From the Annual Users' Meetings . . .

National Synchrotron Light Source

As the nation changes its priorities from national defense to international competitiveness, the National Synchrotron Light Source (NSLS) remains a national resource not only for basic science, but also for applied research with commercial applications.

As was learned at the 1993 Annual NSLS Users' Meeting, U.S. Department of Energy (DOE) Secretary Hazel O'Leary proclaimed the merits of the NSLS before the U.S. Senate's Committee on Energy and Natural Resources on March 23:

> We have developed designated user facilities, designed to provide broad industrial sector capabilities beyond the means of a single firm or even a single industry to provide for themselves. As the world's brightest source of tunable x-rays, the National Synchrotron Light Source at the Brookhaven National Laboratory is perhaps the best known of these facilities and has greatly benefited the electronics, computer and materials industry for a decade.

In light of tight budgets, O'Leary's endorsement of the NSLS was encouraging to the approximately 400 of the NSLS' 2,600 users who attended the meeting, May 19-23. During the meeting, participants were briefed on the progress at the NSLS, both on the scientific programs being carried out at the beam lines and on the accelerator physics front.

"As always, these are difficult

(continued on page 2)

Members of the Users' Executive Committee (UEC) gathered at the 1993 Annual Users' Meeting of the National Sychrotron Light Source: (top, from left) David Heskett, University of Rhode Island; James Long, Naval Research Laboratory (NRL); Syed Qadri, NRL; Jon Levin, National Institute for Standards & Technology; Robert Sweet, BNL; UEC Chairperson Neal Shinn, Sandia National Laboratories; (front, from left) Sasa Bajt, University of Chicago; Michael Dudley, State University of New York at Stony Brook; UEC Vice Chairperson Johnny Kirkland, NRL; Carol Hirschmugl, Yale University; Randy Alkire, Argonne National Laboratory; Paul Lyman, Oak Ridge National Laboratory; and Jean Jordon-Sweet, IBM.

Photographed during a break at the AGS-RHIC Second Annual Users' Meeting, held June 3-4, are: (from left) Nicholas Samios, BNL Director; Melvin Schwartz, BNL's Associate Director for High Energy and Nuclear Physics; Christine Wegman, Staff Member, U.S. House of Representatives Committee on Science Space & Technology; Pat Bautz, Physics Division Deputy Director, National Science Foundation; Alex Dzierba, Indiana University, Chairman of the Users' Committee; Pat Rapp, Physicist, Division of High Energy Physics (HEP), U.S. Department of Energy (DOE); Derek Lowenstein, Chairman, BNL's Alternating Gradient Synchrotron Department; Dennis Kovar, Director of Nuclear Physics, and John O'Fallon, Director, HEP, both of DOE's Office of High Energy and Nuclear Physics. — Photos on this page by Roger Stoutenburgh

Alternating Gradient Synchrotron And Relativistic Heavy Ion Collider

The challenge of carrying out planned physics programs with increasingly restricted funding was the underlying theme of much of this year's Alternating Gradient Synchrotron (AGS) and Relativistic Heavy Ion Collider (RHIC) Users Annual Meeting, held June 3 and 4.

In view of the $20 million budget cut to the RHIC Project and its likely delaying effect on the project's completion, much discussion centered on the possibility of continuing the independent program of high-energy physics experiments at the AGS after RHIC's original projected completion date of 1997.

As Mel Schwartz, BNL's Associate Director for High Energy & Nuclear Physics, commented, "Much is learned about physics at higher energies by looking in great detail at results of experiments at lower energies. The AGS program gives great insight into the validity of the standard model, as well as information about its parameters."

The Witherall Report, written last year by a subpanel of the High Energy Physics Advisory Panel (HEPAP), had recommended that the AGS program end after 1997, when the present round of experiments will

(continued on page 2)

HFBR (cont'd)

inch-thick leaded glass. Grasping two scissor-grip handles on flexible arms mounted outside the cave, an operator can precisely control the motions of two metal-and-rubber arms inside.

"With practice, whatever you can do with your hands you can learn to do with the manipulators," O'Conor said. Indeed, the metal claws easily grip thin rods and spin vises open.

Technicians Joel Errante and Guy Hartsough will operate the remote-control arms, unloading pen-cap-sized sample caplets from cylindrical aluminum capsules after their stay in the reactor core is done.

Many Uses for One Facility

With the HFBR back up and running, samples for three major kinds of experiments will again be irradiated there. By the time you read this, the first may have already reached the sample-discharge facility after an overnight stay in the reactor, O'Conor said.

Isotope production, such as that being done by a BNL researcher using cobalt, allows researchers to obtain specific isotopes they want to investigate for biological, medical or other applications, said Research Coordination Group Leader Norman Holden.

Other experiments measure the effects of radiation on different materials, O'Conor said. Researchers at Oak Ridge National Laboratory have sent a plug of steel similar to that in their lab's reactor vessel for testing, and an Argonne National Laboratory experiment will investigate the extent of radiation-caused mixing between layers of vanadium and niobium, which have potential uses in building fusion reactors.

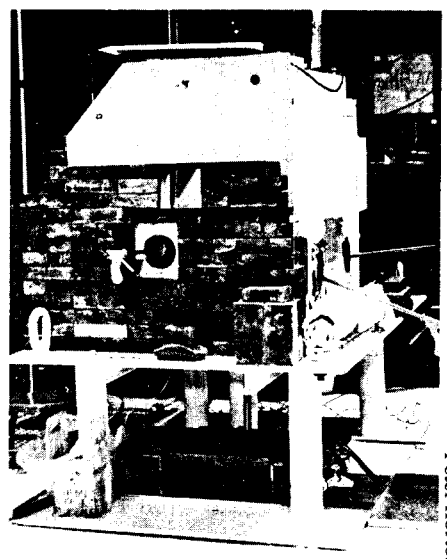
Other experiments that use HFBR irradiation attempt to analyze the composition of unknown materials by looking at the radiation they emit after "baking" in the reactor's core.

One researcher sent the Research Coordination Group some lunar material, to get it irradiated and sent back for analysis and comparison with similar terrestrial material. Two BNL chemists, Lore Holmes and Garman Harbottle, Chemistry Department, compare samples of irradiated marble from statues of known origin with samples from unclassified statues, to help New York City's Metropolitan Museum of Art divine their geographic roots.

Other Attractive Features

This latter, identificational use for irradiation is especially valuable for researchers working with tiny sample quantities that can't be easily detected through chemical means. But, according to O'Conor, the HFBR's irradiation thimbles can actually handle relatively large amounts of material: Samples can be up to 2 centimeters (cm) in diameter and 7.6 cm long.

Holden stressed the HFBR's relatively high flux rate as another attractive feature for scientists: Samples experience neutron bombardment at a maximum rate of 4.2×10^{14} neutrons/cm^2/sec for thermal neutrons and 1.5×10^{14} neutrons/cm^2/sec for fast neutrons greater than one million electron volts.



Peter Horton

Until the High Flux Beam Reactor came back on line last Monday, June 14, technicians had to use the relatively imprecise controls of the old Sample-Discharge Facility to handle radioactive scientific samples.

Because of the new cave's more precise manipulator movement and larger volume, O'Conor said, experimenters now can even request post-irradiation cleaning or opening of the caplets that contain their samples.

Holden added that his group acts as the "person in the middle" between Reactor personnel and researchers who need samples irradiated. During the recent shutdown, Holden and others from his group coordinated researchers' use of the Medical Research Reactor in Bldg. 491. But not every experiment could take advantage of the 10-times-less powerful reactor during its reduced number of operating hours.

The Research Coordination Group began planning the new HFBR sample-discharge facility in 1989, beginning with O'Conor's design. With the help of Sheryl Golden in Reactor Division Administration and Fred Altrui of the Contracts & Procurement Division, O'Conor drew on a budget of $236,000 and selected contractor bids. Funding for the project came from the U.S. Department of Energy's Accelerator and Reactor Additions and Modifications funding.

During his trips to Seattle and Kent, Washington, to visit Hot Cells Services Corporation as they built the facility's modular components, O'Conor enlisted the structural and engineering expertise of Tom Joos of the Reactor Division's Standards and Engineering Group. Assistance also came from Mike Verderosa of the Quality Assurance Group in the Reactor Division. — Kara Villamil

Kara Villamil is a summer student in the Public Affairs Office.

AGS & RHIC (cont'd)

be completed and the accelerator will become the injector for RHIC, unless "exceptional experiments needing the capabilities of the AGS can be carried out in a cost-effective way."

However, the Witherall Report was based on the assumption that the AGS would be running flat out, at 25 weeks per year until 1997, and that RHIC would be completed by that year and the Superconducting Super Collider (SSC) soon afterwards. But, under the current funding levels, these schedules cannot be met.

The view from the U.S. Department of Energy (DOE) was presented by John O'Fallon, Director of High Energy Physics, Office of High Energy and Nuclear Physics (OHENP). O'Fallon explained that, for the past few years, DOE's own operating budget has been consistently decreased by Congress, leaving no alternative but to make cuts to contractors' programs.

With regard to the AGS's high-energy physics program, however, since the SSC will be delayed until at least 2003, and some delay is likely in the completion of RHIC, DOE's position was that BNL could anticipate running the program at the AGS beyond 1997.

RHIC: Going According to Plan

The update given by Mike Harrison of the RHIC Project indicated that all is going according to plan.

In the past year, all industrial contracts were awarded, with dipole and quadrupole magnet production going to Grumman and sextupole production going to a firm in Pennsylvania. He added that 80 percent of the major procurements will be awarded by year's end. Work has also started to complete the last two regions of the tunnel, around the experimental areas.

Although the funding profile for 1984 indicated that RHIC's new finishing date might be March 1999, Harrison said, the work schedule will be flexible enough to take advantage of any surprise extra funding to ensure the least possible delay.

Detector reports were given by Ed O'Brian, BNL's Physics Department, who spoke about the PHENIX configuration, and Tim Hallman, University of California at Los Angeles, who talked about the STAR detector. Both reports showed that past design goals and deadlines have been met, and, while delays due to slower funding are inevitable, plans to minimize the effects are already being made.

Similarly, the Booster report from Bill Weng, AGS, indicated that last year's goals were met, and the present upgrade program for improved intensity is well under way.

AGS: Dynamic Basic Research

Ongoing and planned experiments including searches for rare kaon decays, exotic mesons, strangelets, and neutrino oscillations were described, evidencing the AGS's dynamic basic research program.

In a talk on ARC (A Relativistic Cascade) strangeness, Tom Schlagel, of BNL's Physics Department, demonstrated a method of computationally separating hadronic content from general heavy-ion data, which will be valuable in analyzing data from RHIC.

DOE's nuclear physics program was discussed by Dennis Kovar, Director of Nuclear Physics, OHENP, DOE, who also reported the difficulty of supporting planned programs with reduced funds from Congress. Pat Bautz, Deputy Director of the National Science Foundation's (NSF) Physics Division stressed the same problem in her report on the view from NSF — a wealth of excellent science projects, but insufficient funding.

The somber mood of attendees faced with bad funding news was matched by determination to overcome what could prove to be temporary setbacks. Derek Lowenstein, Chairman of the AGS Department, reported that everything possible is being done to ensure as much AGS running time as possible, including a 15 percent cut in AGS staff, largely through voluntary layoff, attrition and reassignment.

At a cost of $250,000 per week, the estimated AGS running time for 1993 is now expected to be eight weeks during June and July, while the heavy-ion program will run over the four weeks beginning September 1.

The long-range plan for fiscal year 1994 contains at least 14 weeks for high energy physics, eight weeks for heavy-ion physics, and even longer running time if more funds become available.

Despite these funding setbacks, by the end of the meeting, physics, not finance, was the main talking point. The exhortation made by Lab Director Nicholas Samios to "be ingenious, vigorous, and do great physics" was certainly the common goal.

— Liz Seubert

P-CAD User Group

The next P-CAD User Group Meeting will be held on Wednesday, June 23, at 10 a.m., in the seminar room of Bldg. 515, Computing & Communications Division. Tom Gdowick of Altium and Doug Marks of DMA will discuss P-CAD 7.0 and beyond. All are invited to attend. For more information, call Pam Mansfield, Ext. 7286.

NSLS (cont'd)

times for research funding," commented BNL Deputy Director Martin Blume, who welcomed the audience to the meeting. "While the Secretary had good things to say about the Light Source during her testimony, her emphasis was not on basic research, but on industrial research. As a result, there will be more pressure on basic research to make it more applied."

Blume added that, because basic research is the backbone of all research, "Now more than ever, it is important that we articulate to the general public what we do and why we do it, so that they can communicate to their senators and representatives that our research is important to fund."

Appropriately, keynote speaker K.C. Cole elaborated on this theme in her address "The Ever Juicier Mystery: Science for the General Public." A former *Newsday* reporter who is now a senior editor of *Discover* magazine, Cole believes "The public is very interested in science — if only given half a chance."

Interesting Reading

Interesting reading was a chart presented by NSLS Chairman Denis McWhan, showing that 650 papers based on work done at the NSLS were published in journals last year, up 225 from the previous year.

This number was made possible by the reliability record set last year: The x-ray and vacuum ultraviolet (VUV) rings were up and running 96.3 percent and 96.9 percent of the time, respectively, that they were scheduled to be. Not only is this an NSLS record, but it is also a record when the reliability of the NSLS is compared with that of synchrotrons around the world.

"We are getting more and more reliable, as we keep on getting better and better, and make more and more improvements," said McWhan. "The staff continues to work hard to improve the quality and reliability of the beam and explore new instrumentation for the benefit of the user community."

Regarding ring reliability, he cited upgrades of the NSLS injector and computer system, and the addition of a fourth radiofrequency cavity to the x-ray ring, which should enable the doubling of the x-ray ring's current within two to three years. This addition, combined with studies on reducing the vertical emittance of the x-ray ring's beam, is expected to result in an increase in the beam's brightness by a factor of 16.

New Insertion Devices

McWhan elaborated on two projects planned for beam line X13, which takes light from a straight section in the x-ray ring used as a test bed for developing new devices inserted into the ring to increase x-ray brightness.

The first project is the development of a small-gap undulator, an insertion device that will be used to determine the smallest gap, or space, between magnet pole faces that can be achieved without seriously degrading the performance of the x-ray ring. Once commissioned, this insertion device will produce x-rays in the 2,000-to-10,000-electron-volt range, and the beam produced by this undulator will be 1,000 times brighter than any bending-magnet source of x-rays and 5 to 10 times brighter than the NSLS' existing wiggler sources.

The second project McWhan mentioned is the construction of what is called a polarized wiggler, which is being built in collaboration with the Advanced Photon Source at Argonne National Laboratory. Since the demand for polarized x-ray beams has been expanding among users of synchrotron radiation, this device is being developed at the NSLS to allow

control of beam polarization in real time.

In providing high brightness, the powerful insertion devices also impose a high heat load on the beam line's optical elements, which then degrades the brightness. McWhan discussed how this problem has been overcome on beam line X25, which has a wiggler providing a beam with the highest power density available at this time. Solutions discussed by the chairman included the use of adaptive optics made of silicon and of isotopically enriched synthetic diamond.

Said McWhan, "These solutions will also prove of immense value to the next generation of high brightness synchrotron sources."

Clinical Images, New Directions

Another significant instrumentation development mentioned by the chairman was an improved monochromator for the transvenous angiography program, which is being conducted on the superconducting-wiggler beam line X17B2.

A new design, called a bent-crystal transmission monochromator, provides an factor of 10 increase in flux. As a result, commented McWhan, "Image quality is now limited only by the safe dose that can be delivered to the patient. So we have an active medical research program taking advantage of this less invasive technique to picture human coronary arteries."

New directions are being sought for the VUV ring, as a result of the current financial climate.

"Revamping the participating research-team concept and brokering new marriages among VUV users is now necessary, as is a larger involvement by the NSLS in order to maintain the availability of state-ofthe-art facilities," stated McWhan. "What this means is fewer, but higher quality beam lines that are properly supported, so that the best science can continue to be done at the VUV ring."

McWhan updated the users on the progress that the NSLS staff is making as it works toward a future, fourth generation source of intense ultraviolet light (UV), specifically a UV free-electron laser (FEL).

As first steps toward proving the concept of this next light source, McWhan anounced that two demonstration experiments at BNL's Accelerator Test Facility are about to get under way: the first, a visible FEL oscillator; the second, a high-gain harmonic generation experiment.

Finally, the 230-million-electron-volt linear accelerator, originally planned for use as the linac for a compact synchrotron, will be used as a test bed for further demonstration experiments and will be incorporated into a UV-FEL construction project that BNL is proposing to DOE.

— Marsha Belford

Computer Training

The Computing & Communications Division is now offering training on IBM-compatible computers, at all levels. Classes are being scheduled for WordPerfect, Lotus 1-2-3, Harvard Graphics and DOS. For information, call Pam Mansfield, Ext. 7286.

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Russian Underground Art Show

***Town* by B. Samoilov**

From the wide variety of new-style art that exploded out of the Russian underground in the late 1980s, some 30 contemporary Russian paintings, previously forbidden from exhibition in the former Soviet Union, will be shown by the BERA Art Society from June 21 to 23, in Room B, Berkner Hall. Exhibit hours are: Monday, June 21, 11:30 a.m. to 1:30 p.m. and 5 to 7:30 p.m., both with refreshments; Tuesday, June 22, and Wednesday, June 23, 11:30 a.m. to 1:30 p.m.

The 13 artists exhibited are part of the wave of unknown talent that broke over the art world when Gorbachev's perestroika — "restructuring" — allowed avant-garde painters to emerge from their secret studios, where they worked without recognition or payment. Before the radical reforms, the only exhibitions allowed were by painters of socialistic realism — the style adopted by the Soviet government. Others were suppressed.

The styles on display range from primitive and traditional to abstract and surrealistic. The collection was chosen by a Russian BNL scientist who visited the new studios, galleries and exhibitions that opened in Moscow just before his recent emigration to the U.S. He has lent it to the Art Society, "First, because these paintings give some insight into the variety of the new Russian avant-garde style, and, second, because I like these works and hope that somebody will find them interesting also."

Check Out the Library: More Than Just Books

The Technical Information Division (TID) is holding a housewarming on Wednesday, June 23, from 8:30 a.m. to 9 p.m. So all are invited to drop by Bldg. 477 for coffee, refreshments, and a look at the library's new layout, offerings and services, including INFORM, the on-line, menu-driven catalog system containing 15 databases. During the open house, visitors may tour the reorganized and expanded periodical room, book and journal collection, and CD-ROM area.

In inviting all to the housewarming, TID Manager Diane Mirvis says, "We hope our users will find that the Research Library not only offers more up-to-date and accessible information, but that it also is a quieter, more pleasant place in which to do their library research."

Travels With BERA

The Brookhaven Employees Recreation Association (BERA) is offering the following trips. Sign up with Carolann Zebrowski at the BERA Sales Office in Berkner Hall, weekdays, 9 a.m. to 1:30 p.m. For more information, call Zebrowski, Ext. 3347, or Kay Dellimore, Ext. 2873.

Crazy For You on Broadway

For the excitement of Manhattan without any transportation hassle, sign up for the BERA-sponsored bus trip to New York City to see the Broadway show *Crazy For You*, on Saturday, September 11.

The cost of $119 per person includes: round-trip bus transportation; brief stop on 5th Avenue to brouse, shop or snack; an orchestra seat to the matinee performance of *Crazy For You*; full-course dinner at Cafe 44 Restaurant in the theater district; and all taxes and tips.

Make reservations now with a $50 deposit at the BERA Sales Office. The balance is due by August 18.

Atlantic City Trip

The next BERA-sponsored, one-day trip to Atlantic City will be to Trump Castle Hotel and Casino on the Marina, on Saturday, August 7. The initial cost will be $20, but the hotel-casino will give a $7.50 coin return, and a $5 deferred return voucher.

The bus will leave the Brookhaven Center promptly at 9 a.m., with a pickup at LIE Exit 63 if requested. Return will be about 11:45 p.m.

Weight Watchers Summer Sign-Up

Summer registration for the on-site Weight Watchers program will be held on Wednesday, June 23, from noon to 1 p.m., in the south dining room of the Brookhaven Center.

Starting June 30, the group will meet at the same time and place for 12 Wednesday sessions. The fee to BNL employees and their spouses is $90, as BNL pays $10 for each participant.

For more information, call Mary Wood, Health Promotion Sepcialist, Ext. 5923.

BWIS Invites All To Cocktail Party

Summer students, other visitors and all members of the BNL community are invited to attend Brookhaven Women in Science's (BWIS) 14th annual Cocktail Party, which will be held on the patio of the Brookhaven Center, on Thursday, June 24, from 5:15 to 7 p.m.

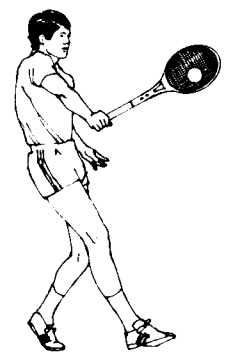
Hot and cold hors d'oeuvres will be served. The cost is $5 per person, $3 for summer students with ID. There will also be a cash bar. R.S.V.P. by today, June 18, to Pam Mansfield, Bldg. 515, Ext. 7286, or Lisa Tranquada, Bldg. 510E, Ext. 7731.

Tennis Tourney Open to All

Start sharpening your tennis game — sign-up starts today for the annual BERA Tennis Tournament, to be played on BNL's tennis courts in the weeks beginning Saturday, July 17.

Tennis Committee Chairman Om Singh said the committee hopes for as much participation as possible by BNL employees and spouses; all those with guest appointments, including summer visitors and students; and, in an effort to fill the women's roster, BNL employees' daughters.

Players can choose to compete in singles, doubles and/or mixed doubles. The entry fee is $3, and signup continues at the BERA Sales Office in Berkner Hall until noon on Monday, July 12. Tournament rules will be available at the time of sign-up, and the draw will be posted by Wednesday, July 14, both at the tennis courts and in the BERA Sales Office.



For more information, call Singh, Ext. 5332, or Ken Perkins, Ext. 2147.

Amateur Radio Club

At the regular monthly meeting of the Amateur Radio Club, on Thursday, June 24, at noon in Berkner Hall, Room D, the upcoming field day will be discussed.

All Lab employees, guests and licensed amateur radio operators are invited to attend. For more information, contact Chris Neuberger, Ext. 4160, or Nick Franco, Ext. 5467.

Arrivals & Departures

Arrivals

Ronald R. Davis.....Nuc. Energy
Daniel H. Galligan.....Plant Eng.
Matthew R. Giles.....App. Science
Omar L. Gould.....RHIC
Jacques A. Negrin.....Physics
Jai Parkash.....Biology
Evangelos Thomatos.....AGS

Departures

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

Helen R. Connell.....Nuc. Energy
Kurt Hillman.....Nuc. Energy
Gerhard A. Ingold.....NSLS
Benjamin Magurno.....Nuc. Energy
Jeanne A. Penoyar.....Nuc. Energy
Augustus Prince.....Nuc. Energy
Philip F. Rose.....Nuc. Energy
Cesar A. Sastre.....Nuc. Energy
Joseph M. Savino.....Nuc. Energy
Frances M. Scheffel.....Nuc. Energy
John F. Svandrlik.....Nuc. Energy

Scoop of the Week

So, starting with the summer solstice at 5 p.m. on Monday, June 21, and continuing throughout the summer season, the Bulletin will be trading ice cream and frozen yogurt for hot tips in the sixth annual Scoop of the Week contest.

If you can scoop all of the Bulletin's informed sources with a hot tip — an idea for Brookhaven news or a feature — and if the Bulletin publishes a story based on your idea, then the Editor will award you a Scoop of the Week. It will be awarded to you in the form of an official certificate for a free frozen dessert of your choice, compliments of Service America Corporation, which operates the Cafeteria where Scoops of the Week may be redeemed.

So, rush your news and feature tips to the Brookhaven Bulletin, Bldg. 134, or call Ext. 5053. If your idea results in a Scoop of the Week, your name will be announced in the Bulletin, after which you will receive your certificate in the interLab mail.

Cafeteria Menu

Monday, June 21

Soup: Chicken noodle	.80/1.10
Entree: Baked BBQ chicken	3.65
Fitness: Pasta w/basil & tomatoes	3.35
Carvery: Hot pastrami sandwich	2.95
Grill: Tuna steak w/wild rice	3.85
Grill: 2 small burgers, fries & soda	2.45
Fitness Salad: Cottage cheese & fruit plate	

Tuesday, June 22

Soup: Tomato rice	.80/1.10
Entree: Vegetable lasagna	3.65
Fitness: Sauteed chicken & broccoli	3.65
Carvery: Hot roast beef sandwich	2.95
Grill: Bacon cheeseburger platter	2.95
Grill: Swiss mushroom burger platter	2.95
Fitness Salad: Fruit platter	

Wednesday, June 23

Soup: Potato kale	.80/1.10
Entree: Swiss steak w/mushroom gravy	3.85
Fitness: Quiche Lorraine	3.35
Carvery: Hot ham sandwich	2.95
Grill: Ham, cheese & bacon platter	3.25
Grill: Chicken breast sandwich combo	3.65
Fitness Salad: Tuna platter	

Thursday, June 24

Soup: Cream of broccoli	.80/1.10
Entree: Fresh ham roast w/veg.	3.85
Fitness: Stuffed vegetarian peppers	3.35
Carvery: Hot corned beef sandwich	2.95
Grill: Steak-um grinder	2.95
Grill: Monte Cristo platter	2.95
Fitness Salad: Cold herb chicken platter	

Friday, June 25

Soup: Manhattan clam chowder	.80/1.10
Entree: Spanish chicken & rice	3.55
Fitness: Baked fish Provencal	3.65
Carvery: Hot turkey sandwich	2.95
Grill: Tuna melt platter	2.95
Grill: Three-cheese melt	2.95
Fitness Salad: Cold salmon platter	

Movie Night . . . Brookhaven Center
Wednesday, June 23. . . 8 p.m.
Distinguished Gentlemen . . . free popcorn!

Classified Advertisements

Motor Vehicles & Supplies

91 MERCURY TRACER LTS - a/t, ac, 4-dr., excel. cond., 1991 *Road & Track* 10 best list, $9,000. Eric, Ext. 5875.

90 TIOGA MOTOR HOME - 23', loaded, 8k mi., mint cond., $25,000 or best offer. Pat, Ext. 7705.

91 PONTIAC GRAND AM LE - metallic gray, fully loaded, sports pkg., tinted windows, quad-4, alum. wheels, warr., mint, $9,500. Mike, Ext. 5904.

89 CHEVY 510 BLAZER - sports pkg., 78k mi., $9,200. 924-3414.

89 HONDA CRX - silver, 5-spd., 75k mi., $3,500. Tom, 751-4174.

88 HONDA ACCORD DX - white, 4-dr., 5-spd., ac, am/fm cass., maint. record, orig. owner, 109k mi., $6,000. Cheryl, Ext. 2272 or 732-7634.

88 FIREBIRD - 57k mi., V-6, a/t, ac, p/s, p/b, cass., adult driver, $4,950. Pete, Ext. 4819 or 289-7218.

88 ISUZU TROOPER - 4-dr., ac, 5-spd., low mi., large tires w/rims, never on beach, mint cond., $7,900. 325-8116.

87 GMC VAN - custom, V-8, a/t, ac, p/b, p/s, p/w, color TV, am/fm cass., CB, all int. opts., VC player, sound system, r. det., $8,950. Bill, 732-2427.

87 MITSUBISHI CORDIA - 2-dr., silver, 4-cyl., a/t, v.g. cond. in & out, runs well, $4,000. 744-5069.

87 CHRYSLER LEBARON - 4-dr., ac, fully loaded, $3,950. Ext. 2962 or 928-6541.

87 TOYOTA TERCEL - 5-dr. h/b, ac, p/s, p/b, stereo/tape, like new, $3,500. Vinnie, Ext 5005.

87 CAMARO - V-6, a/t, ac, alarm, stereo, blue/black int., v.g. cond., $3,500. 874-3796.

86 MITSUBISHI MIRAGE - 5-spd. h/b, am/fm cass., sunroof, eng. needs work, $450 neg. 331-9849.

86 MERCURY LYNX - 2-dr. h/b, 4-spd., 106k mi., well maint., $850. John, Ext. 2788.

85 HONDA DX - 95k mi., good cond., $1,950. Ruth, Ext. 7226.

84 HONDA ACCORD LX - all power, ac, 140k mi., runs well, rear end damage, $1,000. Culwick, Ext. 4930.

84 DODGE ARIES - 4-dr., a/t, am/fm, great on gas, $800. Ext. 3865/7585 or 654-1862.

84 AUDI 4000S - fully loaded, sunroof, am/fm cass., clean, $2,500. Al, Ext. 4718.

83 PLYMOUTH RELIANT - 110k mi., good body/tires, new carb., timing belt, front brakes, runs well, ask. $650. Dominique, Ext. 3189 or 341-1054.

83 NISSAN SENTRA - 5-spd., sunroof, cass., runs well, $1,000 or best offer. Yum, Ext. 4268 or 924-6712.

82 CHEVY CHEVETTE - 81k mi., am/fm, runs well, good cond., new steering, exhaust, $800 neg. Claudio, (212)998-7721, leave message.

81 CADDY COUPE DEVILLE - excel. cond. in & out. Ted, 475-8566.

81 DODGE VAN - custom, new paint, tires, rebuilt eng., good cond., asking $2,000. Lois, Ext. 3315, or Brett, 929-4753 eves.

80 CHEVY CITATION - $150. Ext. 3372.

79 VW RABBIT - gas, a/t, runs well, needs electrical work, $250 or best offer. Stan, 698-9523 eves.

79 VW RABBIT - diesel, 3-dr. h/b, manual, great mileage, 45 mpg, runs well. Ext. 4343 or 744-5023.

78 CHEVY SILVERADO PICKUP - 2wd, 350 c.i., a/t, shortbed, fleetside, black, bedliner, hitch, new rims, & tires, alarm, mint, $3,000. Rich, Ext. 5860.

78 DODGE DIPLOMAT - 318 V-8, 4-dr., a/t, 100+k mi., reblt. trans., new rad., needs rear-end work, $150. Don, Ext. 7237 or 744-2921 after 5:30 p.m.

73 DODGE - motor & trans, 6-cyl., excel. running, will demo, $125. 924-8213.

68 MUSTANG - a/t, $2,000. 473-1456.

62 STUDEBAKER LARK - 2-dr., 6-cyl., a/t, v.g. cond., $1,700 neg. Frank D. Ext. 2022 or 399-4480.

APACHE POP-UP CAMPER - like new canvas, good cond., $125. Al, Ext. 2043.

YAMAHA YZ 125 - mint cond., asking $600. Mike, 878-1617 after 4 p.m.

BED LINER - over rail, for Toyota, $125; rims, 6-lug, 15", $100. Al, 289-1129.

TIRES - radial, P205/75R14, good to excel. cond. Susan, Ext. 7647.

FOLDING TRAILER - Rockwood travel camper, sleeps 6, stove, refrig., self-cont., good cond., $1,200. 689-3146 eves.

TIRES - 2, Goodyear, P225/75R14; 2, Uniroyal P225/75R15; 1, Firestone, P215/7014, like new, $25 ea. Tony, 698-9274.

TIRES - Bridgestone Potenza RE93, size 215-50 VR15, less than 1k mi., $300/4. John, Ext. 7671.

Boats & Marine Supplies

22' MARSHALL CATBOAT - freshwater-cooled Yanmar diesel, VHF radio, depth sounder, Danforth compass, head. Gordon, 477-2269.

22' STAR-CLASS 6210 SAILBOAT - all glass, dbl. hull, 2 sets sails, sail cover, 3-h.p. Yamaha ob., trailer, measurement cert. Bernice, 472-1735.

21' CHRIS CRAFT - 1988, Bowrider, i/o Merc., 8'6" beam, canvas,, am/fm, bottom not painted, E-Z Load trailer, $11,500 neg. 732-8793.

20' SKIFF - fg, 85-h.p. Mercury, needs work, $275. Ext. 4718.

18' HOBIE CAT SAILBOAT - hardly used, w/trailer, $3,500. 473-1456.

18' KLEPPER KAYAK - double fg, w/rudder, mast step, $500 or best offer. Ext. 7657 or 298-9560.

14' BOAT - aluminum, $400; 11' Mayflower sailboat, $300. 473-1578.

8' SAILBOAT - fg, sideboards, almost new sails, ready to go, $350 neg. Frank, 757-0160.

RENKEN WALKAROUND - 1985, 200-h.p. i/o, deep cuddy cabin, electronics, full encl., '92 tandem axle trailer w/power winch. Larry, Ext. 4295.

SUNFISH SAILBOAT - & trailer, v.g. cond., $800. Pam, Ext. 7286 or 581-7656.

CONTROLS - Mercury Morse, top mount, like new, $125. Mike, 878-1617 after 4 p.m.

ELECTRONICS - depth/fish finder, color monitor; Loran w/antenna; VHF radio w/extra speaker, used only 2 mos. Jeanne, 281-7568.

The Brookhaven Bulletin is printed on paper containing at least 50 percent recycled materials, with 10 percent post-consumer waste.

RIMS - for trailer, 10" round, 6" wide, cleaned & painted, $15/2. Gary, Ext. 2011.

OUTBOARD - electric Motor Guard, never used, $85. Ruth, Ext. 7226.

Furnishings & Appliances

AIR CONDITIONER - 5,000 Btu, Fedders, 1 yr. old, used 1 season, $225. Scott, 447-6517.

AIR CONDITIONER - 5,000 Btu, $150; microwave oven, $80; VCR, $120; furniture. Ext. 3805/7585 or 654-1862.

BED - full-size boxspring, mattress, cover; twin-size bed, boxspring, mattress, cover, $35/ea. Joe, 281-8943.

BEDROOM - complete, dark pine, queen-size bed, $350. Al, Ext. 4718.

CHINA - Noritake Misty pattern, 8-place setting, $150; Holly Christmas china, two 8-piece place settings, in orig. boxes. Ginny, 727-5194.

COUCH - Colonial, 7', love seat, 5' long, good cond., $80; dining room set, 8½' table w/6 chairs, china hutch, 80"H x 66½"W. 924-0960.

DESK - youth, dark, Colonial, built-in bookcase, $75. Carl, Ext. 3354 or 929-5781.

DINING ROOM - table, walnut & Formica, 42"x60", 1 leaf, excel. cond., 6 high-back chairs, $125. Betty, Ext. 3164.

DINING TABLE - 1 leaf, 4 chairs, $65. Virginia, Ext. 3938.

DINING TABLE - 8 chairs, excel. cond. 286-1214.

ELECTRIC STOVE - GE, 40", white, works well, asking $100. 286-1331.

FANS - Sherwood, pedestal, never used, 3-spd., orig. $30, ask. $20; Tatung box fan, 20", never used, 3-spd., orig. $50, ask. $40. Gene, Ext. 7113.

FREEZER - Whirlpool, upright, moving, must sell, white, $200 neg; Sharp Carousel II microwave/convection oven, $200 neg. 395-5813.

FURNITURE - bunk beds w/mattresses, boxsprings, $30; student desk w/hutch, built-in light, $30. Mary, Ext. 2815 or 472-4087.

LIVING ROOM SET - couch, 2 chairs, end tables, lamps, $150. Alison, 369-4922.

LOVE SEAT - sofa bed, $75; 4-drawer chest, oak, $25; microwave/convection oven, rotating tray, large, $100. Joe, 281-8943.

MOVING SALE - misc. items, futon, file cabinets. Miriam, Ext. 4343 or 744-5023.

MOVING SALE - living room set, sofa, love seat, chair, end tables, coffee table, $550; TV set, $50. 345-5882.

REFRIGERATOR, STOVE, DISHWASHER - GE, good cond., $100/ea. or $250/all. Ext. 7657 or 298-9560.

REFRIGERATOR - dorm-size, 1.5 cu. ft., used 1 semester, new cond., $50. Richie, Ext. 2175.

REFRIGERATOR - GE, approx. 13 cu. ft., white, good cond., $35. Joe, Ext. 5348 or 331-1372.

SEWING MACHINE - Singer, model 758, hardly used, beautiful cabinet, $125; pattern cutting board, 40"x72", foldable, $1. Virginia, Ext. 3938.

TABLE - drop leaf, 36"x40", $35; ladderback chair, $5; maple butterfly table, $45. 475-4199.

TABLE - drop-leaf, maple, 36"x21¾", extends to 41½", ask. $50; desk, pine, w/kneehole, 47"W x 21½"D x 30½", ask. $75. Sharon, Ext. 3995.

WATER BED - Soma, regular sheets, queen, new, $400. 924-3414.

Tools, House & Garden

GLIDER - seats 3-4, needs paint, $20 neg.; oak vanity, cult. marble, sink w/Delta faucet, 25"W x 22"D x 30½"H, $85 neg. 475-8658 after 3 p.m.

LAWN MOWER - Honda, self-propelled, excel. cond., $125. Charlie, Ext. 2804.

LAWN MOWER - Jacobsen, 21" reel, self-propelled. Bill, Ext. 4774.

POOL FILTER - Tagelus Ta-Go sand filter, i/g, w/6 pos. multiport, 1.5 h.p., Pac Fab pump, motor replaced last season, $325. Kenny, Ext. 5294.

POOL VACUUM - auto., used once, works well, orig. $500, ask. $250. Ady, Ext. 4531 or 331-3785.

Sports, Hobbies, & Pets

BASEBALL CARDS - 1993 Topps HC 825-card sets, Series II wax boxes, vendor 500-card bricks. Leo, Ext. 2952.

BIKE - girl's, 20", 3-spd.; sidewalk scooter, girl's, lavender, w/hand brake. 363-2721.

BIKE - Columbia, woman's, 10-spd., low mi., 45 miles on odometer, $35 firm; men's 10-spd. bike, very good cond., 24", $35 neg. Bill, 281-6498.

BIKE - Atala Giro d'Italio, 10-spd., well made, looks terrible, $25 neg. Tom, Ext. 7196 or 286-2505.

BIKE - 16-spd., good cond., asking $30. Dominique, Ext. 3189 or 361-1054.

CHOW CHOW PUPS - 2 white, 2 red, AKC, 8½ wks. old, $400 ea. 399-3381 after 6 p.m.

COLLECTIBLE PLATES - Star Trek, orig. series, anniversary issue, $30-$40/ea; iguana, $25; guinea pig, $10. Mary, Ext. 2815 or 472-4087 eves.

GUITAR AMP - GK250GL, $200; NADY 201 wireless sys., $225. Doug, Ext. 4661 or 434-7812.

LABRADOR RETRIEVER PUPPIES - AKC registered, black, females, parents on premises. Ext. 4315 or 929-4993.

ORGAN - Esty, bench, books, like new, needs tuning, $250 neg. 475-865 after 3 p.m.

PARAKEETS - blue & green, w/cage, food, $50/all. Tesha, Ext. 3274.

PET HOUSE - cat or small dog. David, Ext. 5974.

POOL SUPPLIES - Haywood, 1-h.p. pump, sand filter, solar pool cover, 16'x32', diving board, $160. 331-1572.

PUPPY - mixed black Lab, female, shots, 8 weeks, very affectionate, adores young children, $50. 298-8657.

RC BOAT - tilt, rudder, throttle, Bud Lite Formula One, O.S. 60 driving amps, 265 lower unit, 55 mph+, orig. $1,000, sell for $450. Tony, Ext. 4095.

SADDLE - 16½, Stubben, all purpose English, w/fittings, $375; Birnbaums's *Guide to Disney*, $6. Pat, Ext. 5406.

TELESCOPE - 3½", Questar case, lenses, tripod, $12; bikes, 2, Fuji Cambridge, full size, one man's, one woman's, $100/ea. 589-3608.

VIOLIN - child's. Ext. 7785.

Audio, Video & Computer

ANSWERING MACHINE - Code-A-Phone, 14 quick dial, $25. 929-4326.

CD PLAYER - Hitachi DA-401, single player, $70 or best offer. Henry, Ext. 7749.

COMPUTER - TRS80 w/disc drive, printer, manuals, software, excel. cond. Pat, Ext. 7635.

COMPUTER - AT compatible, high resolution, color display, expanded memory coprocessor, wide carriage printer, $800. Ext. 3922.

COMPUTER - AT compatible, 286 w/math coprocessor, 40 MB hard drive, color VGA mon., mouse, game port, 2 drives, more. John, Ext. 3108.

SOFTWARE - Lotus 1-2-3, for Mac, version 1.1, brand-new, still in box, $51 or might trade. Orest, Ext. 7990.

STEREO - Mitsubishi, 110W, CD, tape, tuner, equalizer, 2 Bose 210 speakers, $650. 924-3414.

TV - color, 25", Zenith console, $50. Ron, Ext. 2525 or 286-0353 after 6 p.m.

TV - Quasar color, 25", contemporary console, stereo, cable ready, remote, excel. cond., $200. Mary, 399-4857.

VIDEO CLASS - intro. computer learning, 5 tapes, new, $50. 281-4871.

VIDEO GAME - Nintendo, 2 games, 2 controls, $35 neg. 929-3586.

VIDEOTAPES - Star Trek collector's edition, $30/ea. Mary, Ext. 2815 or 472-4087.

WORD PROCESSOR - Smith Corona PWP3800, like new, in orig. box, $200. Ron, Ext. 2525 or 286-0353.

Miscellaneous

ALLIGATOR FLOAT - 84", only used twice, $5. Ext. 2733 or 878-8491.

BOOKS - *Story of Civilization*, by Will Durant, 10 volumes, $40. Charlie, Ext. 2804.

BOOKS - used, cross-stitch, novels, paperback, hardcover. 265-4572.

GOWN - teal blue, size 10, excel., $20. 744-5871.

MIMEOGRAPH MACHINE - A.B. Dick, 550, heavy-duty, electric, make any offer. Phil, 698-9523 eves.

TYPEWRITER - Sears, electric, portable, $25. Doreen, 758-6892.

VACUUM - $20; Hoover deluxe, $45; b&w TV, $25; twin bed, $25; redwood chair, $20; lobster trap, $18. Kathy, 744-2203.

Free

COLOR TV - Heath Kit GR2000 compl. chassis. Fred Kuehl, Ext. 7947 or 588-2268.

DOG - Border Collie mix, female, 2 yrs. old, loves children, spayed, all shots, needs loving family. Ron, Ext. 2525 or 286-0353.

DOG - black & white, female, Siberian Husky, blue eyes, w/papers, needs yard, gentle. 758-6535.

KITTENS - 4, precious gray & black tigers, potty trained, well behaved, need loving homes. Michele, 369-5920.

KITTENS - four adorable kittens, ready for adoption to loving homes. Pat, Ext. 2300.

Yard & Garage Sales

RIVERHEAD - north of Sound Ave., 1 block in of Roanoke, multifamilies, 6/19, 10-4 p.m., no early birds please.

Wanted

ALUMINUM BOAT - Duranautic, 13'-14'. Joe, Ext. 2898.

BICYCLE RACK - preferably new style, bumper mount. Mark, Ext. 2043 or 821-3169.

BRIDGE PLAYERS - to join the new BERA Bridge Club. Willem, Ext. 7778 or 924-6129.

CHILD CARE - mature, energetic individual to care for three children in my Yaphank home, Mon.-Thu. Sheila, Ext. 3144, or Steven, Ext. 4095.

COSTUME JEWELRY BEADS - loose or good, class project. Marilyn, Ext. 2259.

GO-CART FRAMES - with or without motors. Steve, 722-4821 after 5 p.m.

GUITAR - to be donated for use w/children's program in BNL Science Museum. Ruth, Ext. 5461.

HOUSE TO SIT - free, caring, experienced, any duration after June 18. J. Allentuck, Ext. 2412.

OLD DOLLS - the older the better. 475-4199.

INVESTORS - to start BERA club, learn all phases of financial world, socialize, field trips planned, flyer available. Mike, Ext. 3867.

PICNIC SETS - old pine or redwood picnic table & benches, will pick up. Mott, Ext. 7108.

RABBIT CAGE - decent size; marine fish, looking for healthy, inexpensive tropical saltwater fish. Jim, Ext. 4617 or 929-5945.

RENTAL - 2 or 3-bdrm. house or roomy apt., prefer plentiful storage, w/d. Morris, Ext. 4192.

SCALLOP DREDGE - reasonable. Carl, Ext. 3354 or 929-5781.

VOLUNTEER TOUR GUIDES - for college tour program, two half days a year w/supervisory approval, one free lunch. Elaine, Ext. 2400.

In Appreciation

I thank all our friends and co-workers who offered their sympathy and support upon the death of my husband Dominic. He made many good friends during his 27 years at BNL, and h kindness will remain in our hearts forever.

— Marie DeAngelis

I thank all the people at the Lab who generously donated to the Ehlers-Danlos National Foundation and gave their sincere condolences to the Rosenka family and me in our time of grieving for Louise M. Licari. She will be greatly missed.

— James J. Licari

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