

## First Synchrotron Beam Line Dedicated to Infrared Microscopy Being Built at Light Source

Infrared (IR) imaging — using light rays that occur beyond the red end of the electromagnetic spectrum and are invisible to the human eye — has taken a giant step beyond James Bond.

While spies still do make use of IR photography to take pictures in the dark, more high-tech IR imaging devices are in use and being developed for secret and not-so-secret surveillance work. The latter applications include: evaluating certain medical conditions that better reveal themselves under IR; monitoring traffic flow and navigating in bad weather and/or at night; and mapping the environment, natural resources or space.

Until now, however, IR-imaging devices have not been extensively available in these fields due to their high costs. But certain new materials are expected to reduce the cost of IR-imaging devices and thus open a market for this new technology.

To evaluate semiconductor alloys, pyroelectric crystals, and other new materials for IR imaging and other applications, a facility dedicated to the high-resolution characterization

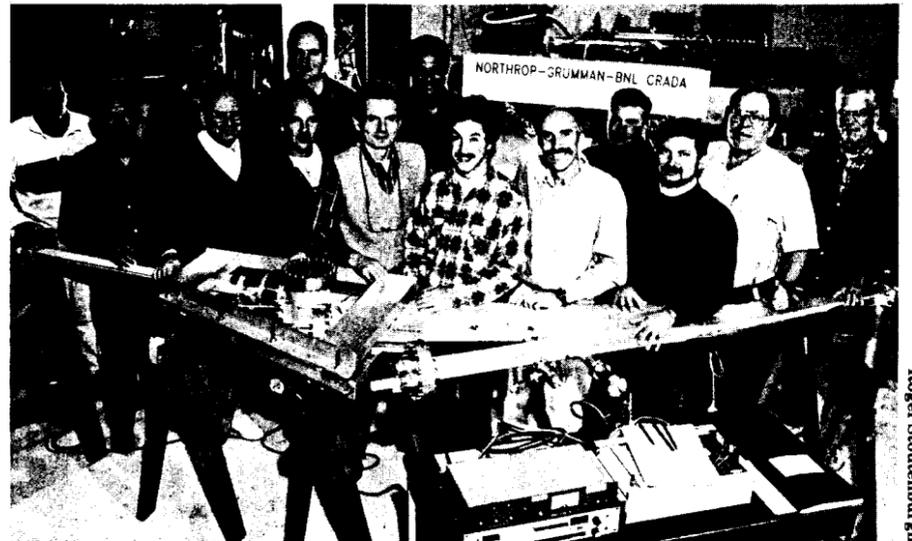
of materials based on their IR properties is being established at BNL's National Synchrotron Light Source (NSLS).

When completed this winter, U10A will be the fifth IR beam line at the NSLS, but its only facility for IR microspectroscopy — and the first at the world's synchrotrons.

"We'll be able to study the properties of materials with high spatial resolution in a nondestructive way and to correlate defects with performance," explains Physicist Gwyn Williams, of the NSLS Beam R&D Group, who initiated the NSLS' IR beam-line program. "By identifying defects that do affect a material's usefulness, manufacturers would then know which defects to eliminate."

### Result of a CRADA

To be located at beam line U10 of the vacuum ultraviolet ring (VUV), this facility will be dedicated to IR microspectroscopy, under a cooperative research and development agreement (CRADA) between the NSLS and the Northrop Grumman Corporation.



Roger Stouenburgh

National Synchrotron Light Source staff who have been involved in the design, construction and installation of the new beam port and vacuum chamber for the vacuum ultraviolet ring's first infrared microspectroscopy facility — the first at any of the world's synchrotrons: (front, left to right) Walter DeBoer, Tom Kim, Mark Shleifer, Robert Chanda, Stephen Dramer, Michael Caruso, Gwyn Williams, Peter Anderson, Larry Carr, Conrad Foerster, Edward McKenna; (back, left to right) Peter DeToll, Douglas Van Campen and Malry Tardd.

The heart of the facility is an infrared microspectrometer, which analyzes the absorption or reflectance spectrum

produced as a function of position when IR light is beamed at areas of the microscopic objects under study.

"By developing techniques for characterizing conventional and novel infrared sensors and focal plane arrays, Northrop Grumman will be able to produce better IR-sensing systems for both the civilian and defense markets," states BNL Associate Physicist Larry Carr, also of the NSLS Beam R&D Group, who was formerly with Northrop Grumman's Advanced Technology Development Center.

Since IR light from a synchrotron is 1,000 times brighter than light from a conventional IR source, the IR microspectrometer has already achieved a resolution of a few microns by a few microns — subpixel resolving power that is a big improvement over a conventional IR microspectrometer, which is limited to 30-50 microns spatial resolution.

Because most new materials and devices for IR imaging have structures ranging in size from 10 to 100 microns, the NSLS' IR microspectroscope can not only probe these devices in the spectral range at which they operate, but also can resolve their smallest structures.

Due to the brightness of the microspectrometer's source of light, the beam-line developers believe that the resolution of their instrument can be increased beyond the diffraction limit, using what are called near-field techniques. And, they have hopes to expand IR microspectroscopy into the far infrared.

### Investigating the Possibilities

In the early 1990s, Carr, then a staff scientist with what was then the Grumman Corporation, came to the NSLS as a general user, to investigate the possibilities of IR microspectroscopy using synchrotron light from the U2B beam line.

"Though Grumman's experiments were very promising, the results were unsatisfactory due to lack of beam time and the inappropriateness of the setup," recalls Williams, who developed and manages the IR beam lines at the NSLS. "But given the power of this technique, we quickly realized that we needed a dedicated facility."

At the time, the NSLS had two IR beam lines, but none exclusively for IR

(continued on page 2)

## Sewage Treatment Plant Upgrade Begins

Construction began last month to upgrade BNL's sewage treatment plant, which treats almost one million gallons of sewage each day.

Hendrickson Brothers, Inc., of Farmingdale won the \$3.25 million project to upgrade the plant from primary treatment to tertiary treatment, and the project is expected to be completed within about a year.

BNL's primary sewage treatment plant has been operating since 1969 under a New York State permit and has an excellent record of compliance.

The upgraded plant will further protect the area's ecosystem by using partially aboveground aeration tanks to significantly reduce nitrogen and other organic nutrient matter significantly. Also, the effluent will be disinfected with ultraviolet light, eliminating the use of chlorine.

Ed Murphy, Deputy Manager of the Plant Engineering Division, said, "Upgrading our sewage plant to tertiary treatment is an example of the



Roger Stouenburgh

Martin Fallier (left), Plant Engineering, discusses plans for the Lab's sewage treatment plant upgrade with Thomas Long of Hendrickson Brothers, Inc., at the construction site.

Lab's commitment to protecting the environment, and we have carefully considered the community's input on the upgrade. The tertiary upgrade will reduce organic material and nitrogen in the effluent and minimize the nutrients discharged to the Peconic River. The process used to do this will duplicate nature's cycles as much as possible."

He added, "We have selected Hendrickson Brothers to undertake the upgrade because they have considerable experience in this type of construction, and they are a well-managed company with an excellent safety record."

### Addressing Concerns

The existing BNL sewage plant consists of a primary treatment process that separates organic solids from the effluent. To reduce further the organic content of the sewage plant's effluent, the Lab had planned last year to upgrade the plant to secondary treatment by installing two aeration tanks

(continued on page 3)

## Evacuation Drill Next Week

Periodically, BNL demonstrates its ability to carry out an evacuation of Laboratory employees in the event of an emergency.

Such an exercise is scheduled for the week of December 9. To simulate actual emergency conditions more closely, the exact date and time of the evacuation drill will not be announced beforehand.

Recently, a Safety & Environmental Protection (SEP) Division information bulletin was issued to all BNLers, outlining the procedures that should be taken during a Laboratory evacuation. Employees should review this bulletin and become familiar with their own department or division's Local Emergency Plan.

Personnel should be aware of their buildings' assembly points and evacuation zone, and the procedures to follow when sirens are sounded and/or there is an announcement over the Electron radio system.

One frequently asked question is: What should I do if I am a member of a car or van pool?

Those attempting to pick up passengers in the usual manner could potentially be exposing themselves to unnecessary risk or creating another hazard. For these reasons, car-pool passengers should make every effort to have alternate arrangements for exiting the Lab, such as evacuating the site with another individual from your building, then meeting your regular car-pool driver at a location off property.

For more information, contact your department or division's Environment, Safety & Health Coordinator or SEP Representative.

## BNLer Martin Van Lith to Receive Environmental Award Named for BNL Retiree Dennis Puleston

In 1968, one year after the founding members of the Environmental Defense Fund (EDF) held their first meeting in a BNL Biology Department laboratory, Martin Van Lith joined the Physics Department as a scanner.

Now a national organization with many environmental victories to its credit, the EDF has also inspired a new generation of local environmental activists. Some of them formed the Open Space Council (OSC), a Brookhaven Town-based group dedicated to preserving the open space and quality of life in this area of Long Island.

And, on Saturday, December 7, the OSC will present its annual Dennis Puleston Conservation Award — named after the BNL retiree who was the EDF's first chairman — to Marty Van Lith, who is now a technical associate in Physics.

In receiving this award, Van Lith joins a list of previous winners that includes Puleston himself, New York State Assemblyman Steven Englebright and Richard Amper, President of the Pine Barrens Society.

The OSC chose Van Lith to receive its 1996 award "for his leadership and commitment to protecting natural areas in the Carmans River Watershed and Great South Bay Estuary."

The Carmans River and the Great South Bay, respectively, form the eastern and southern boundaries of Brookhaven Hamlet, where Van Lith moved 14 years ago. His new home, however, reminded him of the Shirley area on the other side of the river, where he had grown up enjoying the lushness and wildlife on land, and the bounty and beauty of the bay.

The mania for development that had eaten up so much of Shirley's and Long Island's open spaces seemed to have passed by Brookhaven Hamlet, which already enjoyed several large tracts of preserved land: the Wertheim National Wildlife Refuge on the

Carmans River, a length of state-owned shoreline on the bay, and some large parcels on the Beaver Dam Creek purchased by the private Post Morrow Foundation.

Van Lith joined the land-preservation tradition started by Brookhaven Hamlet residents like the Post Morrows and continued by others like Puleston and the late Virginia Brown, who was Manager of Compensation & Projects in BNL's Personnel Division when she died in 1993.

In 1988, Van Lith was elected to the Board of Trustees of the Brookhaven Village Association (BVA) and began working with Brown, who then chaired the group's Land Use Committee. After Brown died, Van Lith assumed the chair and continued their work.

Today, Van Lith counts among this committee's achievements the concept that inspired New York State's Great South Shore Estuary Reserve Act of 1993. Suggested in a letter that the BVA had sent to state legislators in 1990, this act created a commission that is developing a protection plan for the entire ecosystem of creeks, rivers and wetlands running from the Atlantic Beach Bridge in the west to the Shinnecock Canal in the east.

Under Van Lith's guidance, this committee also persuaded Suffolk County to establish the Dennis Puleston Nature Preserve on the Beaver Dam Creek and Brookhaven Town to establish the Fire Place Nature Preserve along the Great South Bay.

A frequent advisor to the Post Morrow Foundation, Van Lith has also been working with the OSC and the Wertheim Refuge to have a 128-acre parcel called Southaven Properties, which is a candidate for development and surrounded on three sides by the refuge, incorporated into that preserve. Last spring, Van Lith and OSC President Marilyn England testified before a Congressional appropriations com-

mittee on behalf of the federal government's acquisition of Southaven Properties, a move that has the support of Congressman Michael Forbes.

"Long Island is a truly unique environment, a beautiful place," said Van Lith, "but, in our everyday world of work, traffic and shopping malls, we often lose touch with these roots. It's important to preserve these last remaining open spaces — not just for the wildlife that we hope will thrive there, but for the people who live here and need their quiet and replenishing beauty. Without the vision and untiring efforts of people like Virginia Brown and Dennis Puleston, Long Island as we know it would have been long gone."

In the 1960s, Puleston's studies of weakened osprey eggs on Gardiner's Island showed that the pesticide DDT was having deleterious effects on the food chain. This led Puleston, BNL biologist George Woodwell and several other area scientists to wage a legal battle for a ban on DDT in Suffolk County. This group's success led to the EDF — and to the return of the osprey.

Then head of the Technical Information Division, Puleston retired from BNL in 1970 and went on to a new career, as lecturer and naturalist on small cruise ships.



Marty Van Lith (right), this year's recipient of the Open Space Council's Dennis Puleston Conservation Award, and Dennis Puleston, meet near Puleston's sailboat *The Montauk*, at Squassux Landing on the Carmans River in Brookhaven Hamlet.

"My travels have taken me to such remote and unspoiled parts of the world as the Galapagos, Alaska, Madagascar, Siberia, Antarctica and Indonesia," said Puleston, "but I have always kept an eye on BNL and read the weekly Bulletin assiduously. I have always held the Lab in deep affection. It's a grand installation. Keep up the good work!"

Puleston will be at the OSC's Candlelight Holiday Benefit tomorrow to present Van Lith with part of his award — an artwork by Puleston, who is well known for his watercolor paintings of local bird and plant life. For more information about the benefit, call Marilyn England at 758-5915.

— Anita Cohen

## Using Synchrotron Radiation for Semiconductor Research

The quality of microcircuits is affected by the quality of the semiconductor wafers on which they sit. Producing quality wafers is a challenge, given the narrow line widths of electrical components on circuits and the low tolerance for contamination of semiconductor devices. So, for researchers and manufacturers of semiconductors, evaluating semiconductor quality and correlating it with device performance is of utmost importance. In fact, research at many beam lines at BNL's National Synchrotron Light Source (NSLS) is dedicated to doing just that (see story on page 1). However, many semiconductor manufacturers have limited experience in using synchrotron radiation as a semiconductor probe. So, to introduce



them to the general opportunities presented by synchrotron radiation and, specifically, at the NSLS, the Second International Workshop on Semiconductor Research Using Synchrotron Radiation was held at BNL earlier this year, and drew 60 participants. Pictured are some of those responsible for the workshop: (front, left to right) Vic Rehn, Office of Naval Research-Toyko; Robin Ambrose, NSLS; workshop local organizer Gwyn Williams, NSLS; workshop co-chair Martin Blume, BNL Physics Department; Lydia Rogers, NSLS; (back, left to right) workshop program committee chair Slade Cargill, Columbia University; and workshop co-chair Yi-Han Kao, State University of New York at Buffalo. — Marsha Belford

### New IR Beam Line (cont'd.)

microspectroscopy. To establish one, however, meant that the VUV ring had to be modified, to create a new port to allow IR light out of the ring.

With the CRADA approved in December 1994, work began at the NSLS in 1995 to design and fabricate the hardware needed to get the IR beam out. As a result, one new beam port and vacuum chamber for an eighth of the VUV ring were devised and built by NSLS scientists, engineers and technical staff. During a scheduled shutdown of the VUV ring from last December through this January, the synchrotron hardware was installed by Ed McKenna's and Walter DeBoer's Mechanical and Vacuum Groups, respectively.

In the meantime, Carr of Northrop Grumman worked on the design and fabrication of the instrumentation necessary to perform IR microspectroscopy. This included the purchase of a conventional IR microspectrometer — and its modification to accommodate its new synchrotron light source.

Awaiting the commissioning of U10A in February 1997, a temporary home for IR microspectroscopy was found at beam line U2B in June 1995.

While at U2B, Northrop Grumman began evaluating an alloy of mercury-cadmium-telluride (MCT), which is a semiconductor for IR sensors. MCT is being developed for use as a substrate, which is the material on which microcircuits will be fabricated.

Carr explains, "Northrop Grumman

is using IR microspectroscopy to look for defects in the substrate and identify which defects are bad, meaning they will affect the performance of the circuit on top of the substrate. Since these defects are only up to 20 microns in size, this is an ideal tool with which to evaluate them."

Another example of the research that Northrop Grumman is carrying out using IR microspectroscopy is the evaluation of different methods of curing the epoxy used to form graphite-epoxy composites used in aircraft structures. "They are examining the interface between the graphite and epoxy, looking at IR vibrational modes," says Carr.

Under the CRADA, Northrop Grumman will be able to use U10A 30 percent of the time. The rest of the

time will be divided in halves, shared equally between NSLS users and staff scientists. "From the work done so far, we believe this facility has great potential for unique microanalysis for biology, polymers, pharmaceuticals and semiconductors," concludes Williams.

— Marsha Belford

### Public Auction

Thirty-two vehicles will be auctioned to the public by sealed bid on Tuesday, January 7, 1997. Those interested may inspect the vehicles outside warehouse T-87 from 10 a.m. to 3 p.m. on December 12 & 13. During that time, bid forms may be obtained in T-87. For more information, contact Donna King, Ext. 4599, or Jerry Quigley, Ext. 4527.

## Draw Near to the Fair!

To learn about more local agencies that provide hope and help to Long Islanders in situations that are hard to handle alone, come to the United Way Agency Fair in Berkner Hall, 10 a.m. to 2 p.m., next Wednesday, December 11.

At the fair, various agencies drawing support from the United Way will provide a close-up view of why a donation to the United Way means so much.

Another kind of drawing will also be part of the fair: Fliers announcing the event will be distributed on Monday, December 9, and they will have a tear-off pledge form at the bottom. Any employee who turns in a pledge at the fair and contributes at least \$1 a week will be eligible for a special drawing to be made at 2 p.m.

Prizes that day will include American Express and restaurant gift certificates. Employees or retirees who have already contributed are eligible for the majority of the remaining prizes: more gift certificates, an autographed Jets football, an inflatable raft and a New York City theater trip.

"Our goal for the United Way fund drive this year is \$90,000, and so far, donations have totaled \$58,000," said Esposito. "The extra pledge cards on the flier and available at the fair will give people a chance to make donations if they have forgotten, or, perhaps, to make a small addition to the gifts they have already made, just for the sake of helping in such a good cause, and for the fun of being eligible for some extra prizes."

As Esposito explained, every contribution makes a dif-



Roger Stouenburgh

**BNL United Way Fund Drive Chair Peter Esposito and Coordinator Ann Emrick practice their evenhandedness in preparation for drawing winning pledge cards at the United Way Agency Fair.**

ference. "But, early pledges are especially helpful," he said, "so that agencies know what funds they can count on to support programs for the coming year. By adding pledges to the BNL effort now, you will help us reach our goal by the drive's end on December 20."

For more information, call Esposito, Ext. 2879, or Emrick, Ext. 5756. — Liz Seubert

## Outreach Workshops

### Difficult People

At noon today, "Dealing With Difficult People" will be discussed by Linda Costanza, C.S.W., at an Outreach workshop in Berkner Hall. For more information about the talk, see the last Bulletin or call the Employee Assistance Program (EAP), Ext. 4567.

### Family Dynamics

As much fun as it can be to gather with family and friends in celebrating the winter holidays, the season to be jolly can result in a royal case of too much togetherness.

With so many memories and so much hope riding on each celebration, it is hard not to disappoint someone, since everyone's expectations of family and friends are different. This is especially true if bad family dynamics are detonated, whereby everyone falls into their old roles and picks up old, unresolved arguments.

To learn how to avoid or minimize the pitfalls of get-togethers with family and friends, come to the next Outreach workshop, sponsored by the Occupational Medicine Clinic's EAP. "Home for the Holidays: Exploring Family Dynamics," will be presented by the popular Outreach speaker Joann Fallon, C.S.W., who will talk on Tuesday, December 10, from noon to 1 p.m. in Berkner Hall. All are invited, and the talk will be available afterwards on audiocassette from the Research Library, Bldg. 477.

To register, return completed the bottom portion of the Outreach flyer recently sent to all employees to EAP Staff Psychologist Dianne Poloczky, Bldg. 490, by Monday, December 9. For more information about EAP, call Ext. 4567.

## Plant Upgrade Begins (cont'd.)

in the ground. This would have required dewatering, a conventional construction process in which groundwater is pumped out of an area being excavated. The Lab had a New York State permit to discharge a limited amount of groundwater into the Peconic River on the Lab site, if necessary, during construction.

The sewage plant effluent and the groundwater around the plant contain low levels of tritium, a radioactive isotope of hydrogen that is a by-product of some BNL operations. While the dewatering process would have added slightly more tritium into the headwaters of the Peconic River on Lab property, the tritium concentrations in both the sewage effluent and the groundwater around the sewage treatment plant are generally less than 10 percent of New York State's drinking water standard.

Nevertheless, some of the public became concerned about the effect of the dewatering process on the Peconic River. In response, the Lab postponed the upgrade last October, while seeking input on the project from environmentalists, civic representatives, regulatory agencies, local consultants and government officials. The new upgrade plan addresses their concerns.

### New Design: No Dewatering

In the new design, the aeration tanks will be constructed partially aboveground, and the Lab will build a pump station to lift wastewater up to the tanks. Consequently, dewatering to the Peconic will be eliminated.

The new design, including the upgrade to tertiary treatment, will cost about \$600,000 more than the initially planned upgrade to secondary treatment. The Lab will also spend about \$30,000 more per year to operate the plant because of increased electrical and maintenance costs.

— Diane Greenberg

## BWIS Meeting

### BNL in the News

Over the past year, BNL has been the target of criticism in many areas. One of those who has been on the frontline in dealing with these issues is Mona Rowe, the Supervisor of External Communications in the Public Affairs Office.

Employees and guests who need information to answer the questions they may be facing from family, friends and neighbors can get it at the next Brookhaven Women in Science (BWIS) meeting, when Rowe will speak briefly about "BNL in the News." After her opening remarks on Wednesday, December 11, at noon, in Room B, Berkner Hall, Rowe will answer questions.

Rowe, who holds a bachelor of music degree from the University of Hawaii, and a master of fine arts from Carnegie-Mellon University, joined BNL's Personnel Division in January 1977, then transferred to the Director's Office two months later. She has been a BNL spokesperson since 1981.

All are invited; please bring your lunch.

**Do your holiday shopping  
at the Winter Holiday Sales  
at the BNL Science Store**



**Three Fridays:  
December 6, 13 & 20  
10 a.m. to 3 p.m.  
in Bldg. 701**

20 completely new items  
this year, including  
**Gurglin Gutz . . . Stomp  
Rockets . . . Slime  
Chemistry . . . and**

**The BNL 50th Anniversary Calendar**  
(not available on December 6)

*Each BNL employee will receive one calendar free via interoffice mail next week; visitors and guests, and employees who want more than one may purchase these commemorative, 11"x14" calendars for \$5 each, at the Science Store or the BERA Sales Office in Berkner Hall, starting later next week. Supplies are limited.*

## Sunday in Berkner: 'Classical Cabaret'

Come to the "Classical Cabaret" this Sunday, December 8, at 2 p.m. in Berkner Hall to hear the critically acclaimed husband-and-wife duo, soprano Jody Karin Applebaum and pianist Marc-André Hamelin, perform European and American cabaret masterpieces.

Their varied program will include songs by modern American composers, such as George and Ira Gershwin, as well as European cabaret songs from the nineteenth century.

Tickets cost \$14 general admission, \$9 for seniors, and \$5 for students and youths under 18. Purchase them from the BERA Sales Office today, from 9 a.m. to 1:30 p.m., or on Sunday at the door. Arrive early for the best seats.

## Coming Up

**Physicist Benjamin Ocko, Physics Department, will deliver the next Brookhaven Lecture on Wednesday, December 18. Entitled "Ice Skating, Burning Candles, and the Role of Interfaces in Freezing and Melting," Ocko's talk will begin at 4 p.m., in Berkner Hall.**

## Handball Club

The BERA Handball Club plays outdoors on site daily at lunchtime, weather permitting. Two courts, player rotation and short games of doubles assure maximum participation in this challenging sport. For more information, call Manny Grau, Ext. 6328.

## Equipment Demo

The products of Del Global Technologies, a manufacturer of high-voltage power supplies and transformers, will be displayed and demonstrated on Thursday, December 12, from 11 a.m. to 1:30 p.m. in Berkner Hall.

## Computing Corner

*The Computing & Communications Division (CCD) offers the following:*

### Last Call for Windows 3.1

As of March 1, 1997, CCD will offer Windows training only for Windows 95. So, to meet the needs of those employees requiring training in Windows 3.1, CCD offers Windows 3.1 training on video and interactive training on CD. To reserve a video, call Marcia Swiss, Ext. 4144; to schedule an interactive training session, contact Pam Mansfield, Ext. 7286 or e-mail pam1@bnl.gov.

### Intro to HTML

To teach beginners basic Web-page publishing and linking, CCD will offer a one-day, hands-on class entitled "Introduction to HTML (HyperText Markup Language)" twice in January, on the 6th and 8th. Each class is limited to eight, and the fee is \$210 per person. For a course outline or to register, contact Pam Mansfield, Ext. 7286 or e-mail pam1@bnl.gov.

### NCD X Terminals

A two-day course covering the system administration of the X-terminal in a UNIX environment and focusing on the efficient management of a community of terminals will be offered, at a date and time to be announced. The course will be limited to 12, and the fee is \$425 per person. For more information and to register, contact Ed McFadden, Ext. 4188 or e-mail emc@bnl.gov.

## BROOKHAVEN BULLETIN

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## Here & There

Beakman, star of CBS television's *Beakman's World*, will be the featured guest of a "Holiday Science Spectacular, on Thursday, December 19, at 7 p.m., at Riverhead High School," to benefit The Place for Learning.

Local resident **Peter Takacs**, Instrumentation Division, is helping this not-for-profit organization raise funds for a science museum in Riverhead.

Before the show, from 6 p.m., **BNL's Science Museum** will offer interactive science exhibits on sound, magnets and 3-D. Run by BNL museum staff member **Gail Donahue**, this booth will be among others set up in the school's Science Exhibition Hall. For advance tickets for the Spectacular, at \$7 each, call 727-0900.

## BERA Toy Drive

For the 13th year, BERA is participating in Brookhaven Town's Toy Drive, which is organized to provide happy holidays for needy children in the local community. From November 18 through December 16, toys, preferably new, for infants through teenagers, may be brought to the BERA Sales Office, Berkner Hall, weekdays, 9 a.m. to 1:30 p.m. For more information, call Andrea Dehler, Ext. 3347, or M. Kay Dellimore, Ext. 2873.

## Holiday Get-Together

The Hospitality Committee invites all on-site residents and their friends to an evening holiday get-together, from 5:30 to 7 p.m. on Thursday, December 12, in the Recreation Bldg.

While roast turkey will be provided, guests are asked to bring a favorite dish to share. For more information, call Vicky Chang, Ext. 1064, or Susan Hart, 821-4257.

## Rifle & Pistol Club

The next meeting of the Rifle & Pistol Club will be on Wednesday, December 11, in Room 202, Bldg. 911B, at noon. For more information, call Otto Jacobi, club president, Ext. 3471.

## For Your Information

Information calls — both local and long distance — are being placed from BNL at a cost of about \$11,000 per year. "That's a bit expensive," said Ralph Trondle, of Telecom Services in the Computing & Communications Division, "but, with some free look-up services available on the Internet, we can cut these costs considerably."

When you need to find an individual's phone number, Trondle recommends that you access <http://www.switchboard.com> on the World Wide Web and follow the simple directions.

For commercial establishments, access <http://bigyellow.com>. The less information you provide, the better the result; so, on the first try, enter only the company name and state.

Save both these URLs as bookmarks in your browser so that you can quickly call them up when needed.

"While these services are fast and free, they may not have the very latest listings," Trondle said, "but they will yield good results most of the time."

## Volleyball

### Standings as of November 27

Open League		League I	
Shank, Carry & Throw	17-4	Bikers 'n Spikers	17-4
Far Side	14-10	Rude Dogs	17-4
Death Volley	11-10	Scared Hitless	8-13
Pass, Set & Crush	10-11	Set to Kill	7-4
Spikers	2-19	Net(e)scapers	5-19

League II		League III	
Spiked Jello	15-0	Silver Bullets	18-0
Safe Sets	13-2	Upton Ups	14-4
Jao>About-That	12-6	Just 4 Fun	12-6
Fossils	7-8	Group Sets	10-8
Monday Nite Live!	7-8	New Comers	9-9
Nuts & Bolts	8-10	Court Hogs	6-12
Lift, Carry, Throw	5-10	OER	3-15
Jolly Volleys	3-12	Over-in-Three	0-18
Night Court	2-16		

## Classified Advertisements

### Placement Notices

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

Each week, the Human Resources Division lists new placement notices, first, to give employees an opportunity to request consideration for themselves through Human Resources, and second, for general recruiting under open recruitment. Because of the priority policy stated above, each listing does not necessarily represent an opportunity for all people.

Except when operational needs require otherwise, positions will be open for one week after publication.

For more information, contact the Employment Manager, Ext. 2882, or call the JOBLINE, Ext. 7744 (344-7744), for a complete listing of all openings.

Current job openings can also be accessed via the BNL Home Page on the World Wide Web. Outside users should open "http://www.bnl.gov/bnl.html", then, under "Information," select "Jobs." For scientific staff openings, select "Scientific Personnel Openings"; for all other vacancies, select "General Personnel Openings."

**SCIENTIFIC RECRUITMENT** - Doctorate usually required. Candidates may apply directly to the department representative named.

**POSTDOCTORAL RESEARCH ASSOCIATE** - Trained in physics and/or analog/digital electronics with experience in radiation detection, to participate in the design of novel x-ray detectors for use at the NSLS. Should have experience in detector development, so as to develop and implement the integration of a prototype device into a beam-line data-acquisition system. Familiarity with condensed-matter physics or materials science is an asset. Contact: Peter Siddons, National Synchrotron Light Source Department, or Graham Smith, Instrumentation Division.

**LABORATORY RECRUITMENT** - Opportunities for Laboratory employees.

**DD4723. OFFICE SERVICES POSITION** - (term appointment) Requires an AAS in secretarial science or equivalent experience, excellent communication skills and demonstrated interpersonal skills. Familiarity with IPAP, JCARS, journal vouchers and Excel also required. Duties will include a variety of clerical functions, such as data entry, credit-card ordering, recharging, file organization and maintenance. Will assist in Division administrative office and Hardware Services Section as required. Computing & Communications Division.

**DD3219. OFFICE SERVICES POSITION** - (term appointment) Requires a familiarity with WordPerfect 6.1, Excel and a knowledge of Laboratory procedures. Will provide clerical support as needed, including data entry, filing, ordering supplies and distributing mail. Office of Environmental Restoration.

**OPEN RECRUITMENT** - Opportunities for Laboratory employees and outside candidates.

**MK 4102. MANAGER, PUBLIC AFFAIRS** - Requires a bachelor's degree, extensive experience in all aspects of public affairs, and excellent oral and written communication skills. An understanding of science and technology, management experience and an advanced degree are highly desired. Will be responsible for directing and managing the Public Affairs staff and program, and ensuring that the Public Affairs program addresses appropriate issues at all community and governmental levels. Will develop and implement public relations policy, advise Laboratory management on addressing issues that are of public and employee concern, and act as spokesperson to local and national media on significant or sensitive issues. In addition, will perform special communication and editorial projects for top management. Director's Office.

**NS 6195. PHYSICS ASSOCIATE POSITION** - (term appointment) Requires an MS in physics and background with numerical simulation of charged-particle motion in EM fields, and experience within a workstation environment. Will assist the accelerator physics group of the NSNS collaboration in the calculation of dynamic aperture and multipole corrections. Alternating Gradient Synchrotron Department.

**DD6189. TECHNICAL POSITION** - (term appointment) Requires an AAS degree or equivalent experience in mechanical or electrical technology. Knowledge of shop tools and practices, precision measuring devices, close-tolerance mechanical assemblies, digital voltmeters and oscilloscopes is highly desirable, as is familiarity with PCs. Experience with high-voltage techniques, programmable logic controllers and vacuum equipment is also highly desirable. (reposting) Alternating Gradient Synchrotron Department.

**NS 0593. ENGINEERING POSITION** - (term appointment) Requires bachelor's degree in electrical engineering or a related field, and experience developing software for VME-based measurement systems. Experience in digital signal processing for particle-beam regulation is required, as is experience with real-time control systems and rf electronics. Will be responsible for the design and development of hardware and software for the RHIC Beam Control System computer interface. Relativistic Heavy Ion Collider Project.

### Motor Vehicles & Supplies

95 DODGE NEON - iridescent blue, 4-dr., low mi., excel. cond., \$8,500. Arnold, 473-6432.

93 MAZDA 626 LX - 4-dr., a/t, ac, p/w, p/l, cruise, tilt, abs, p/roof, alarm, alloys, \$9,000. Joe, Ext. 4567.

93 SATURN SL2 - blue w/tan int., abs, all power, excel. cond., \$8,800. 722-4636.

92 ACURA INTEGRA - 3-dr., 65k mi., a/t, ac, p/w, moonroof, alarm, am/fm cass., clean, excel. cond. must see, \$8,500. Tracy, Ext. 4422.

92 FORD F150 XL - 4wd, V-8, loaded, running lights, bedliner, mag wheels, 42k mi., \$14,000. David, 878-1303.

91 VW PASSAT WAGON - 16-valve eng., 100k mi., excel. in/out, \$5,600. 325-1907.

89 MUSTANG - 4-cyl., 5-sp., white, p/s, p/b, p/w, cass., new clutch, brakes & muffler, 98k mi., orig. owner. \$2,900. Kevin, Ext. 2766.

89 PLYMOUTH GRAND VOYAGER - ac, cruise, high mi., runs well, looks good, ask. \$2,400. John, Ext. 5283.

89 COUGAR LS - silver, all power, ac, cruise, orig. owner., excel. cond. in/out, \$4,200. 724-7548.

89 MITSUBISHI - 103k mi., T-top, p/ant., Graffice equalizer, a/t, p/w, excel. cond., \$2,900. Julian, 924-0960.

89 NISSAN PULSAR NXXE - ac, 5-sp., am/fm cass., T-top, orig. owner, \$4,000 obo. 929-0663.

88 HONDA CRX-SJ - yellow, Alpine radio, sunroof, high mi., orig. owner, excel. cond., \$3,850. S. Aronson, 689-8685 eves. & wknds.

88 ISUZU TROOPER - 2.6 liter, 4-cyl., 4wd, new tires, p/s, p/b, a/t, ac, stereo cass., \$2,000 neg. Dave, 289-4330.

88 SUBARU JUSTY GL - 80k mi., 4 new tires, m/t, parting out or whole, \$400 obo. George, 732-1999.

88 TOYOTA PICKUP - V-6, 4wd, bedliner, 33" tires, 103k mi., \$3,900. 325-1907.

87 TOYOTA COROLLA FX - 3-dr. h/b, 121k mi., v.g. cond., \$2,500. Fern, Ext. 3969 or 399-9210.

87 CAMARO RS - 100k mi., runs well, excel. body, \$2,500 neg. Rich, 758-9875.

87 SKYHAWK - 4-dr., a/t, new batt., rad. & water pump, needs eng. work, all else good, \$500. Tom, Ext. 7707.

87 HONDA ACCORD - white, 5-sp., 2-dr., ac, am/fm cass., 143k mi., runs well, reliable. Ted, Ext. 2620 or 751-6765.

86 TOYOTA COROLLA - parting out or complete car, needs head gasket, \$200. Bill Struble, Ext. 3499.

85 OLDS CUTLASS SUPREME - 6-cyl., 4-dr., p/s, ac, am/fm, orig. owner, \$1,250. Bob, 928-6541.

85 PONTIAC BONNEVILLE - black, 6-cyl., rebuilt trans., 98k mi., runs, needs work, \$300. Rich, Ext. 5893 or 744-4816.

85 NISSAN 4X4 - king cab, cap, winch, new trans., clutch, tires, brakes, clean, 122k mi., runs well, \$3,250. Gary, Ext. 2808 or 864-8119.

84 HONDA ACCORD - 60k mi., clean, avail. 12/31, \$2,000. Marcel, Ext. 3890.

85 PONTIAC SUNBIRD - a/t, 132k mi., runs well, \$400. Sergei, Ext. 1027/6297.

83 LEBARON - 4-cyl., a/t, good tires & brakes, am/fm cass., high mi., dependable, \$500. Tirre, Ext. 3288 or 281-0360 after 6 p.m.

82 CADILLAC - green, 4-dr., cruise, 160k mi., runs well, reliable, some new parts, must sell, ask. \$900. Giuseppe, Ext. 5336.

80 CHEVETTE - red, m/t, clean in/out, starts & runs well, \$380. 744-2836.

80 HARLEY SUPERGLIDE - new top end, wheels, brakes, etc., excel. cond., \$7,500. Dave, 878-1303.

79 FORD PICKUP - fwd, 351 c.u., mech. good, some rust, \$1,800 obo. Tom, 727-0225.

79 JEEP CHEROKEE CHIEF - 2-dr., 4wd, 117k mi., trailer hitch, runs well, good cond., \$2,000. Ext. 6344 or 929-3388.

71 CHEVY MONTE CARLO - 350 small block, rally wheels, ask. \$2,500. Steve, Ext. 2964 or 878-6391.

70 CHEVY BISCAYNE - 6-cyl., m/t, 82k orig. mi.; '70 Chevy Impala, 6-cyl., 82k orig. mi., 3-sp.; \$400/ea., both running. John, 696-7452, leave message.

**CAMPING TRAILER** - Nomad, 24', sleeps 6, good cond., must sell, \$2,500. Bill, Ext. 2762.

**CAMPER** - Coleman Sun Valley, sleeps 6, water, elec. hookups, many extras, excel. cond., \$2,900 obo. Tom, Ext. 7287 or 744-4535.

**CAP** - for small truck, fg, sliding windows, 81"x58", \$100. Bob, Ext. 7527.

**CAP** - dark blue, 8' bed, good cond., ask \$275. John, Ext. 4297.

**ENGINE STAND** - 1,250 lb. cap. w/4 wheels & tool tray; Allied eng. lift, 8-ton cap., \$300/both; cap. small pickup, alum., sliding window, \$275. Dennis, Ext. 4612.

**RADAR DETECTOR** - Escort Solo 5, cordless, all bands & laser, w/warranty, \$100. George, 726-6184.

**TRAILER HITCH** - for '86-'96 Blazer, Bronco, Voyager or GMC van, Reese class II, new, \$65 obo. Frank D., Ext. 2022.

**ENGINE** - for '84 Ford Ranger, 2.9L, V-6, w/m/t & radiator, \$250 all. Ken, Ext. 5960.

### Tools, House & Garden

**HEATER** - Toyost OMNI-230, kerosene, excel. cond., \$65. Russ, Ext. 5129.

**HEDGE TRIMMER** - 16" or 18", new cond., orig. \$60, sell \$30. Richard, Ext. 4134.

**KEROSENE HEATER** - Sunbeam, 20,000 Btu, excel. cond., \$120 obo; window, 5'x4', slide, brand-new, cost \$270, ask. \$200. Ext. 2683 or 751-2469.

**KEROSENE HEATER** - \$40; clock, wind-up, w/glass dome, \$10; picture, 50"x30", \$15. JoAnn, Ext. 7009 or 588-8492.

**LADDER** - alum., 4 segments; vacuum cleaner, power tools, moving, must sell. Marcel, Ext. 3890.

**POTS** - T-Fal, 8-pc. set, never used, \$50; hot water tank, 42-gals., \$40. Joan, 751-7023.

**STOVE** - coal/wood, airtight, w/pipe, many extras, excel. cond., asking \$385. Bob, 689-9234.

**STOVE** - coal/wood, Franco Belge, Ext. 2487.

**STOVE** - coal/wood, Franco Belge, 30,000 Btu, \$450 obo. Sharon, Ext. 3995 or 878-9355 after 6 p.m.

**WATER HEATER** - Phase III, indirect, excel. cond., orig. \$900, sell \$450. Sue, Ext. 7235 or 399-7997.

**WINDOW** - Andersen, 4'x4', picture, mint cond., \$125. Joe, Ext. 4826 or 821-3762.

### Sports, Hobbies & Pets

**ICE SKATES** - Bauer, men's sizes 7 & 9, like new, \$35/ pr. John, Ext. 4695.

**PUPPY** - 6 mos. old, AKC, male, Pomeranian, crate trained, housebroken, all shots, must sell, \$500 neg. incl. crate. 331-4810.

**SKIS** - Head GX Exclusive 185 w/Marker M28, full Spectrum bindings, Raichie RE260 boots, used once, \$260. Dennis, Ext. 4612.

### Miscellaneous

**CARRIAGE** - pink, \$50; microwave cart, \$75; entertainment center, \$25; bassinet, \$25; swivel TV stand, \$25; kit: table w/4 chairs, \$225. Don, 929-6571.

**CHINA** - Old World Blue Willow, service for 7, boxed, never used, orig. \$175/place setting, sell \$100/place setting; baby & toy items incl. Portacrib. 821-1246.

**WATCH** - men's, Mavado, new, silver & gold, orig. \$600, asking \$350. 422-5313.

**CHRISTMAS DISPLAY FIGURE** - angel, animated, \$20; bedspread, Bates, chenille, queen-size, \$10; quilt, lightweight, full-size, new, \$15. Ext. 3766.

**JACKET** - heavy-duty, wool, w/hood, Longwood School team, green, excel. cond., \$30. 924-8558 after 5 p.m.

**JACKETS** - starter, youth size, XL, Knicks, \$25, Bills, \$21; women's winter, \$10/ea.; boy's navy suit, size 14, \$15. 751-7023.

**MAPLE SYRUP** - from my family's farm in Vermont. Peter, Ext. 7687 or 744-1112.

**TICKETS** - 2, Radio City Christmas Show, Fri., 12/20, 5:30 p.m. show, 4th row, \$128. Vivian, Ext. 7123.

### Free

**PHOTO COPIER** - Panasonic FP1300, works, but needs some work, you pick up. Jeff, 929-4974.

**DOBERMAN** - neutered, male, black, cropped, 1 yr. old, w/shots. John, Ext. 3675 or 924-3528.

**FIREWOOD** - large logs, you must pick up and take all. 744-5871.

### Wanted

**BICYCLE** - for 6 yr. old girl. Jean, Ext. 5720.

**COMPUTER** - 486, for beginner, reasonable; press, auto, for garage use. Bill, 281-6498.

**DOGHOUSES** - old, used, or similar for use as shelter for stray cats. Pat, Ext. 7705 or 821-2171.

**LEAF SHREDDER** - backyard size, stationary w/hopper loading. John, Ext. 7671.

**MECHANIC** - Suzuki dirtbike, frustrated student needs experienced dirtbike mechanic's help, engine prof. rebuilt, bike refuses to kick over. Richie, 467-1947.

**SKIS** - downhill, 150 cm, w/boots, size 7 1/2, bindings, & poles. Vera, Ext. 7702.

**SNOW BLOWER** - small, electric or defunct gasoline that could be converted to electric. Ralph, Ext. 2180.

### Services

Services are listed in the first **Bulletin** of every month as a courtesy to BNL employees. They are neither screened nor recommended by the **Bulletin**. Services forms are available in the **Bulletin** lobby, Bldg. 134.

**ATTORNEY** - real est., wills, injury, matrimonial, health ins., other, free consult, Lab disc. Anna, 874-7337.

**BABY-SITTER** - 20-yr.-old college student, weekdays/nights, wknds., local, refs. avail. Vickie, 399-2179.

**BRICKWORK** - masonry, patios, walks, swimming pools, retaining walls, landscaping ties, Belgium block, 25 yrs. exp., Lab disc. Tony, 698-9274.

**BUSINESS CARDS** - raised lettering, many colors, BNL cards available, letterheads, envelopes, fliers, carbonless forms. Mike, 878-3480.

**CARDIO-KICKBOXING** - Kempo, Tae Kwon Do, Bu-Jitsu, grappling, boxing, children/adult classes, a.m./p.m. classes. Richard, 289-2939.

**CHIMNEY CAPS** - fireplace, wood, coal, oil flue, pre-fab oil chimney, stainless steel, lifetime warranty. Mike, 821-5526.

**COMPUTERS** - custom-built Pentium, full 1 yr. warr., intel CPU, name-brand components, competitive prices. Tom, 434-9345.

**COUNSELING** - exp. lic. RCSW will help w/individual, marital or family problems, confidentiality guaranteed, insurance reimbursable. Linda, 929-5860.

**COUNSELING** - individual, child & family therapy, alcohol & drug counseling, licensed, social worker. Jane Negrin, 732-5464.

**DJ** - all occasions, specializing in Latin & old school music, start at \$200, Lab discount. Robert, 467-2790.

**DRAFTING** - house plans or alteration design & construction drawings with energy codes. 929-8514.

**GRAPHICS** - print your name, logo, business cards, labels, fliers, T-shirts, anything. Steven, 345-6960.

**GUTTER PROTECTION** - guaranteed, lic. & ins. free est., Lab discount, Henry, 727-7227.

**HOME IMPROVEMENTS** - carpentry, drywall, spackling, painting, plumbing, ceramic tile, electrical, free est., Lab disc. Don, 929-6571 after 5:30 p.m.

**HOME IMPROVEMENTS** - extensions, dormers, decks, kit, baths, siding, roofing, lic. & ins., refs. Chris, 286-1348.

**JEWELER** - special orders, repairs, honest, affordable, no job too large or small. Kelly, 821-5239.

**LAND CLEARING** - trees, stumps, brush removed, topsoil graded and raked w/450 loader, \$70/hr. Tom Muller, 878-1060.

**LANDSCAPING** - cleanup & maintenance, etc. Jesus, 286-5403.

**LAWN SPRINKLERS** - auto., prof. layouts, repairs, alterations, additions, spring turn-ons, winterizations, free est., prompt, courteous service. 928-7973.

**LOCKSMITH** - sales & service, 10% Lab discount, keys cut during lunch. Pete, 399-2813 after 5 p.m.

**MAILBOXES** - custom-made, installed, many colors & designs, free catalog. Mike, 821-5526.

**PAINTED FINISHES** - prof., marbelizing, ragging, sponging, combing, graining, murals on floors, walls, ceilings & trim. Phil, 286-1348.

**PIANO LESSONS** - exp. teacher for children or adults, student recitals, grade exams, more. Jun, 473-8406.

**SAWS** - 1