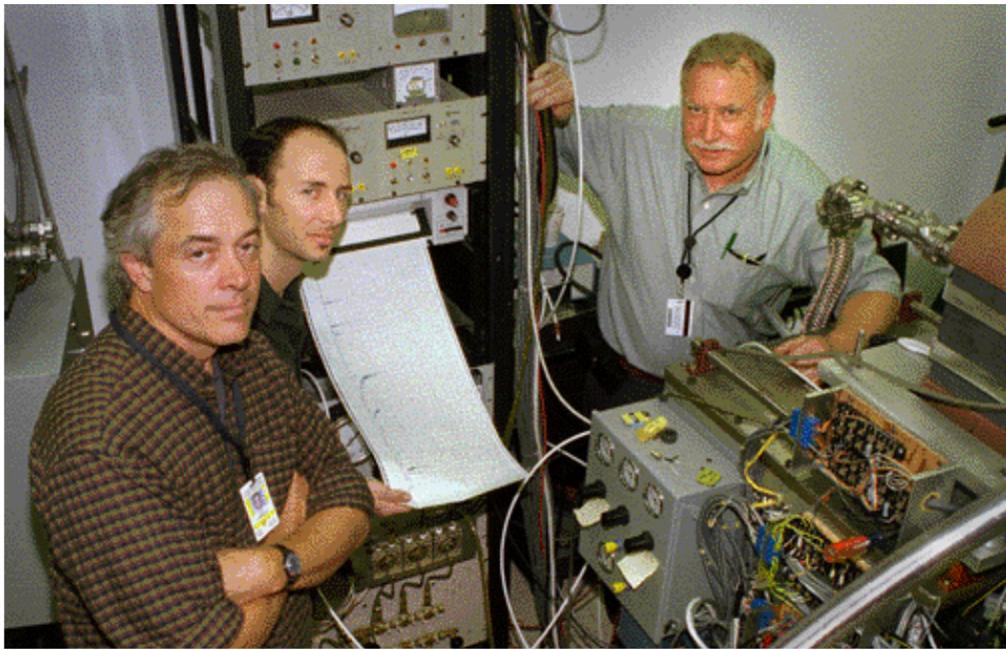


## Some Viruses Take Strong Hold of Cells

As part of an ongoing effort to understand how viruses infect cells, BNL scientists and collaborators at Purdue University and the University of Tennessee have deciphered the molecular-level interaction between coxsackievirus and the human cell protein to which it attaches. This work, published in the October issue of *Nature Structural Biology*, may lead to improved ways to thwart viral infections and may help scientists design virus-based vehicles for gene therapy.

The study reveals that the receptor protein for coxsackievirus, known as coxsackievirus-adenovirus receptor or CAR, forms pairs on the surface of human cells, with two adjacent CAR receptors attached to one another below the surface of the cell membrane. When coxsackievirus binds to the human cell, it forms bonds with both receptors of the pair.

"The binding becomes almost irreversible because both bonds would have to reverse simultaneously to release the virus," says Paul Freimuth of BNL's Biology Department. "That increases the likelihood that the virus will infect the cell." Coxsackievirus typically infects the heart, brain, pancreas, and other organs. *(continued on page 2)*



Biology Department researchers (from left) Paul Freimuth, Jason Howitt, and Carl Anderson study the way that viruses infect cells.

Joseph Rubino CNR-156-01

## Six BNL Scientists Awarded Tenure

BSA has granted tenure to six BNL scientists this summer. They are: Radoslav Adzic, Energy Sciences & Technology Department; Milind Diwan, Physics Department; Paul Freimuth, Biology Department; John Haggerty, Physics; Robert Sweet, Biology; and Xijie Wang, National Synchrotron Light Source Department. A series featuring the accomplishments of each of the six recently tenured scientists began in last week's Bulletin. This week features Milind Diwan.

### Milind Diwan

For his talent and achievements in high-energy physics, Milind Diwan, an experimental particle physicist in the Electronic Detector Group, was nominated for tenure by the late Physics Department Chair Michael Murtagh.

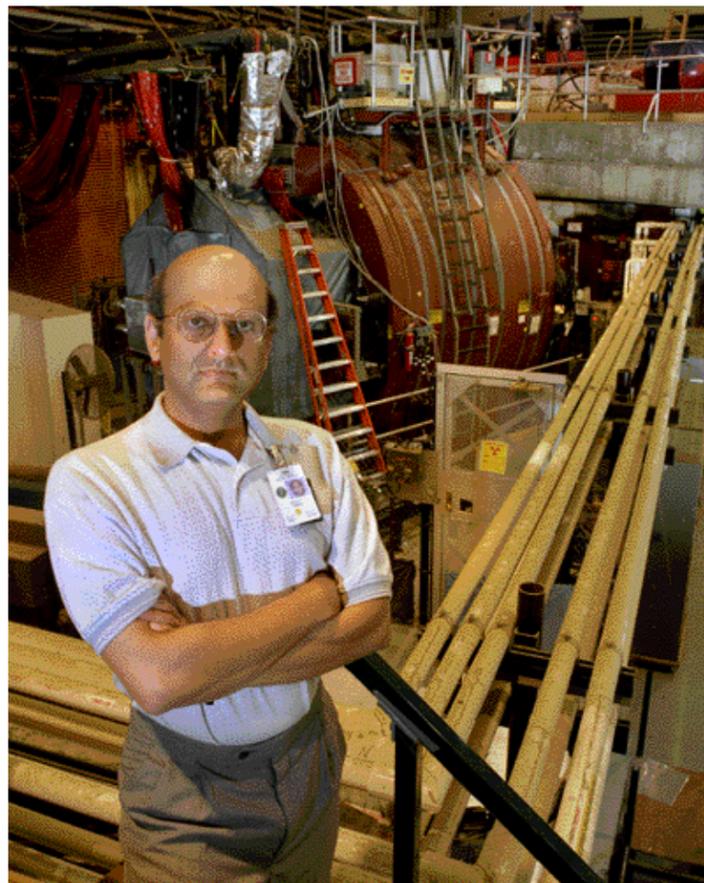
"Milind's primary focus has been the rare kaon decay experiment E787, for years the flagship high-energy physics experiment at the Alternating Gradient Synchrotron," explained Murtagh. "In almost every aspect of the analysis of this difficult experiment, Milind has made significant improvements, succeeding in extending it into a new region of phase space which should lead to significant improvements in coming runs."

In addition, Diwan is leading the BNL effort on the MINOS long-baseline neutrino experiment at Fermi National Accelerator Laboratory.

Milind Diwan received his Ph.D. in experimental physics

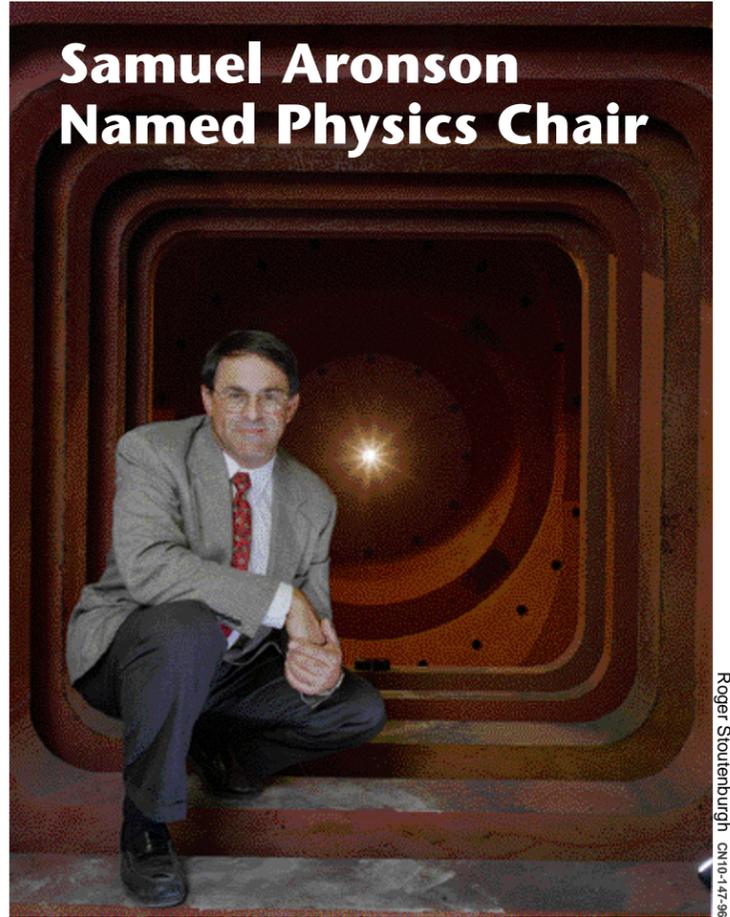
from Brown University in 1988. He came to BNL in 1994 as an assistant physicist and was promoted to associate physicist in 1996 and to physicist in 1999.

— Marsha Belford



Roger Stoulenburgh CNR-0-01

## Samuel Aronson Named Physics Chair



Roger Stoulenburgh CNR-147-96

BNL Senior Physicist Samuel Aronson has been named Physics Department Chair. Until assuming the Chair, Aronson had been the Project Director of PHENIX, one of the five detectors at BNL's Relativistic Heavy Ion Collider (RHIC).

In appointing Aronson to his new position, BNL Director John Marburger said, "Sam Aronson has exhibited strong leadership and good judgment in his work. At the same time, his thoughtful and considerate personality and his comfortable interactions with people have resulted in widespread support for his new role in the Physics Department."

Aronson's appointment became effective on September 5, after the untimely death of his predecessor, Michael Murtagh. During the interim, Deputy Chair Doon Gibbs served as acting Physics Chair. Now, under Aronson's leadership, Gibbs continues as Deputy Physics Chair, while Howard Gordon continues as Associate Physics Chair.

BNL's Physics Department has a staff of over 300 and an annual budget of over \$40 mil-

The Department is the headquarters of three of the four major nuclear-physics experiments at RHIC: BRAHMS, PHENIX and STAR. On the four experiments, about 1,000 physicists from worldwide rely on the heavy-ion beams at RHIC to create quark-gluon plasma, a form of hot, dense matter that last existed moments after the Big Bang.

Also based in the Physics Department is RHIC's fifth experiment, pp2pp. Proton-proton elastic-scattering studies will be done at all five experiments, using polarized and unpolarized proton beams which RHIC is expected to accelerate this fall.

Another Physics' project is to participate in the design, construction and operation of the ATLAS detector in the Large Hadron Collider (LHC) at CERN, the European particle-physics labo-

*"I am proud of Physics' accomplishments, and our research is flourishing. I think Mike Murtagh did a tremendous service for the Department, and I hope to maintain the direction he set."*

lion, with more than 80 percent of its funding supplied by DOE.

Research in the department primarily focuses on investigating the structure and behavior of subatomic particles. Scientists design and perform basic research in experimental and theoretical high-energy, nuclear, and solid-state physics, to investigate the laws of matter and energy.

"I am proud of Physics' accomplishments, and our research is flourishing," commented Aronson. "I think Mike Murtagh did a tremendous service for the Department, and I hope to maintain the direction he set."

ratory. The LHC is expected to be operating by 2006 and will be the world's highest energy particle-physics accelerator.

BNL physicists are also working on the D-Zero experiment at DOE's Fermi National Accelerator Laboratory. Aronson had participated in designing and constructing this experiment, which studies a subatomic particle known as the top quark, co-discovered by D-Zero in 1995.

In planning for the future, Physics has proposed that the National Science Foundation fund a project known as RSVP. *(continued on page 3)*



## Coming Up

### Brookhaven Lecture

Larry Carr of the National Synchrotron Light Source Department will present the 367th Brookhaven Lecture on the use of infrared synchrotron radiation in the material sciences at 4 p.m. on Tuesday, October 23, in Berkner Hall. All are welcome.

### 'A Year Not in Provence'

Dry humor and exquisite art will be enlivening Berkner Hall on Wednesday, October 24, beginning at 5:15 p.m., when David Bouchier, award-winning essayist for WSHU, will give a humorous talk on "A Year Not in Provence," about his recent stay in France. Diane Barthel-Bouchier's museum-quality paintings and drawings of birds seen during the same stay in France will be displayed in the lobby. All are welcome.

## Physics Chair (cont'd.)

for Rare Symmetry Violating Processes. The two proposed RSVP experiments, KOPIO and MECO, would require creating more intense particle beams at the Alternating Gradient Synchrotron (AGS). Both experiments have the potential to explore new physics phenomena and to change physicists' understanding of the fundamental properties of matter.

If RSVP comes to fruition, then it would help to fulfill one of Aronson's goals for the Physics Department — to extend forefront high-energy physics at the AGS into the future. He also expects to see RHIC experiments upgraded and RHIC itself enhanced with an electron ring.

Physics is also home to solid-state physics groups, which conduct research at the NSLS, as well as at light sources and neutron sources elsewhere in the U.S. and abroad. These groups are internationally known for their work in correlated electron systems, surfaces and interfaces, magnetism, and superconductivity.

Aronson said, "I am very much looking forward to working with these groups as they initiate new directions in condensed matter theory and nanoscience, particularly toward materials synthesis and soft matter."

The new Chair's priorities for Physics also include fostering more collaborations with Stony Brook University scientists and maintaining a secure but easily accessible computer environment for use by BNL's research collaborators around the world.

A native of Huntington, Aronson earned his B.A. in physics from Columbia University in 1964 and his Ph.D. in physics from Princeton University in 1968. From 1968 to 1972, he worked at the University of Chicago's Enrico Fermi Institute for Nuclear Studies as a research associate. He then took a faculty position at the University of Wisconsin until 1977.

Aronson joined the Lab's then Accelerator Department in 1978 as an associate physicist and was named physicist in 1979. Moving to Physics in 1982, he was appointed Physics Associate Chair in 1987 and served as Deputy Chair 1988-91.

Earlier this year, Aronson was named a Fellow of the American Physical Society.

— Diane Greenberg

**Dosimetry badges will be exchanged today, Friday, October 5. Remember to place your badge in its assigned rack space before leaving work today.**

## Flu Shots Next Week

Flu vaccine will be offered to all eligible employees at the Occupational Medicine Clinic, Bldg. 490, during the week of October 15, as follows:

Time	Last Name
9:30-10:45 a.m.	A to G
11 a.m.-noon	H to M
1- 2:15 p.m.	N to S
2:30-4:30 p.m.	T to Z

For more information about the flu vaccine, call Ext. 3670, and ask to speak with a nurse.

## Arrivals & Departures

### Arrivals

Adrian Dumitru	Physics
Nigel George	Chemistry
Mark Harvey	Physics
Yongjae Lee	Physics
Boris Narozhny	Physics
Kotaro Sasaki	En. Sci. & Tech.
Bernd Surrow	Physics
Alfredo Temprosa	Info. Tech.
Adriana Tovar-Salazar	Medical

### Departures

Stephen Ashworth	En. Sci. & Tech.
John Barry	Chemistry
Robert Carciello	Chemistry
Tage Carlsson	Plant Eng.
Robert Chmiel	Physics
François Gelis	Physics
William Higinbotham	Biology
Kenneth Kowalski	Plant Eng.
Hong Ma	Env. Science
William Michalowski	Physics
Jacques Negrin	C-A
David Rorer	Reactor
Norman Sutin	Chemistry
Joyce Tichler	Env. Science

## COMPUTER TRAINING

The following PC training classes have been scheduled for October/November:

Date(s)	Class	Level
10/17	Excel	beginner
10/18&19	Access	beginner
10/22	FrontPage	beginner
10/23&24	Project	beginner
11/2	Outlook	
11/7	PowerPoint	intermediate
11/8	Excel	advanced
11/15&16	Access	intermediate
11/28&29	Project	intermediate
11/30	FrontPage	intermediate

Note: classes with two dates are two-day classes

### Future plans

The Information Technology Division (ITD) is planning the training program for the next fiscal year. Send suggestions for future courses and comments to Pam Mansfield, pam@bnl.gov.

### Registration

To register for the classes listed, or to register interest in a future class, send a training request form, and an ILR or Web requisition for the appropriate amount, to Pam Mansfield, Bldg. 515. For more information, registration forms, and class schedules, visit the ITD training page at: <http://training.bnl.gov/>.



Joe Sanfilippo, Collider-Accelerator Department, has created his version of "A Sad Day" in this photomontage of pictures off the Internet. "As a young boy, I lived in Queens, and, from my bedroom window, I was able to see the progression of work on the World Trade Center as it was built. What took so long to complete came down in minutes. It's hard to believe," says Sanfilippo. (See this montage in color on the web in this week's Bulletin, one click from BNL's homepage, [www.bnl.gov](http://www.bnl.gov).)

## Creative Corner

## Healthfest 2001 Participation Award Percentage Counts; Sign Up Now!

- **Who?** You and your coworkers in your department or division!
- **What?** Earn the 2nd annual Healthfest participation award!
- **When?** During the Lab's 9th annual Healthfest, October 15-19!
- **Where?** Activities and events will take place around the site!
- **Why?** Department/division pride! Renewed motivation for personal and workplace health, fitness and safety!
- **How?** The department or division that has the highest percentage of participation in Healthfest events will win! So sign up now (see coupon, page 4)!
- **How much?** Free! All it costs is your time, interest and energy!
- **More information?** Contact: Mary Wood, Ext. 5923.

## Necessary Lab Security Procedures

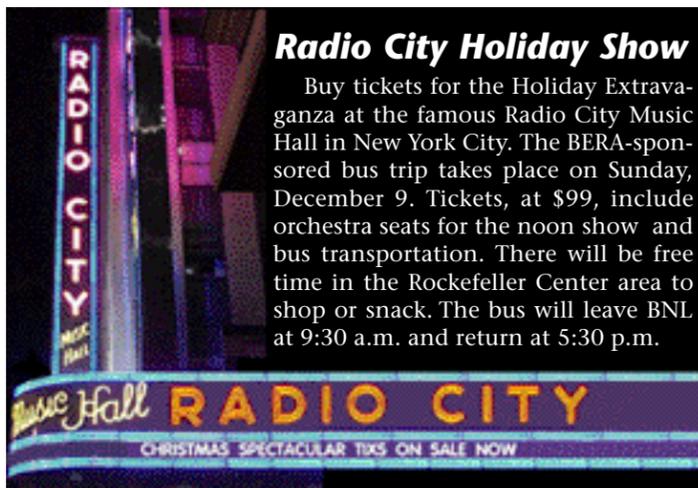
As security remains heightened, the Safeguards & Security Division (SSD) reminds BNLers and Lab visitors of the following procedures and thanks them for their cooperation:

- Everyone entering the site must have a BNL or other photo ID available for the Security Police Officer to inspect. Those without a BNL ID will be issued a temporary ID card. The ID card must be worn at all times while on site.
- All vehicles on the BNL site must have a vehicle sticker or vehicle pass. Visitors, guests, contractors, and employees can obtain a vehicle sticker or pass from the Personnel & Information Security Office in the Brookhaven Center, Bldg. 30. A driver's license, vehicle registration, and ID card are required to obtain a vehicle sticker or pass.
- All visitors and guests must be registered with SSD before their arrival at the Lab. BNLers must preregister visitors 24 hours in advance using the on-line form at [www.bnl.gov/ssd/](http://www.bnl.gov/ssd/). For same-day visits call Ext. 4271 between 8:30 a.m. and 5 p.m.

## Join in Breast Cancer, Heart Walks

Two important community walks are taking place during the month of October: The American Cancer Society's "Making Strides Against Breast Cancer" walk will be held on Sunday, October 14, at Jones Beach State Park. Registration begins at 9 a.m. Also, the American Heart Association is holding the "American Heart Walk" on Sunday, October 21, at Suffolk Community College in Selden. Registration begins at 8 a.m.

For more information or to get registration materials, contact Mary Wood, Ext. 5923 or [wood2@bnl.gov](mailto:wood2@bnl.gov).



## Radio City Holiday Show

Buy tickets for the Holiday Extravaganza at the famous Radio City Music Hall in New York City. The BERA-sponsored bus trip takes place on Sunday, December 9. Tickets, at \$99, include orchestra seats for the noon show and bus transportation. There will be free time in the Rockefeller Center area to shop or snack. The bus will leave BNL at 9:30 a.m. and return at 5:30 p.m.

## Calendar

(continued)

### Take Our Sons to Work Day

Sons between the ages of 11 and 15 may spend the morning with their parent in the workplace, then tour BNL and listen to career talks. Susan Foster, Ext. 2888.

### Wednesday, 10/10

#### Rifle & Pistol Club Meeting

Noon, Bldg. 535 Conference Room. For more information, contact Jim Durman, Ext. 5993, Sue Foster, Ext. 5529, the Club's hotline, Ext. 2658, or see [www.bnl.gov/bera/activities/rpc](http://www.bnl.gov/bera/activities/rpc).

### Friday, 10/12

#### GLOBE Meeting

Brookhaven's Gay and Lesbian Club. For specific time and meeting location, contact Mike Loftus, Ext. 2960, or Chris Gardner, Ext. 4537.

#### Pot Luck for Newcomers

5:30 p.m., Recreation Bldg. The Hospitality Committee invites all Lab newcomers to a pot luck dinner. Bring family and a dish to share. For more information, contact Shashi Somani, Ext. 1064, or Mimi Luccio, 821-1435.

## —WEEK OF 10/15—

### Thursday, 10/18

#### BERA Bridge Club

7 p.m., Berkner Hall. Morris Strongson, Ext. 4192, [mms@bnl.gov](mailto:mms@bnl.gov).

## —WEEK OF 10/22—

### Monday, 10/22

#### IBEW Meeting

6 p.m., Patchogue, and 3 p.m. in the union office.

### Tuesday, 10/23

#### \*Brookhaven Lecture

4 p.m., Berkner Hall

### Wednesday, 10/24

#### Noon Recital

Music at noon in Berkner Hall.

#### \*Humor and Art

5:15 p.m., Berkner Hall. David Bouchier and Diane Bartel Bouchier.

### Thursday, 10/25

#### Brookhaven Advocacy Council Meeting

Open Session, 12:30-1 p.m., Berkner Hall, Room C. Nancy Warren, Ext. 7548.

## —WEEK OF 10/29—

### Saturday, 11/3

#### BNL Ballroom, Latin & Swing Dance Club: November Social

8 p.m. to 11:30 p.m., North Ballroom, Brookhaven Center, \$2/person club and BERA members, \$5/person nonmembers. Marsha Belford, [belford@bnl.gov](mailto:belford@bnl.gov) or Ext. 5053; Ron Ondrovic, [ondrovic@bnl.gov](mailto:ondrovic@bnl.gov) or Ext. 4553; Sue Perino, [perino@bnl.gov](mailto:perino@bnl.gov) or Ext. 2483.

## —WEEK OF 11/5—

### Sat., Sun, 11/10-11

#### BERA Overnight Shopping

Join a weekend trip to shop till you drop at Pennsylvania outlet centers. Hotel will be arranged. Details next week.

## —WEEK OF 11/12—

### Wednesday, 11/14

#### Divorced & Separated Support Group

noon-1 p.m., Berkner Hall, Room D. Mary Campbell, Ext. 4776, [maryc@bnl.gov](mailto:maryc@bnl.gov).

Note: This calendar is updated continuously and will appear in the Bulletin whenever space permits. Submissions must be received by the preceding Friday at noon to appear in the following week's Bulletin. Please enter the information for each event in the order listed above (date, event name, description, and cost) and send it to [bulletin@bnl.gov](mailto:bulletin@bnl.gov). Write "Bulletin Calendar" in the subject line.

## Classified Advertisements

### Placement Notices

The Lab's placement policy is to select the best-qualified candidate for an available position. Candidates are considered 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, disability or veteran status. Each week, the Human Resources Division lists new placement notices, first, so employees may request consideration for themselves, and, second, for 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; call the JOBLINE, Ext. 7744 (344-7744), for a list of all job openings; use a TDD system to access job information by calling (631) 344-6018; or access current job openings on the World Wide Web at [www.bnl.gov/JOBS/jobs.html](http://www.bnl.gov/JOBS/jobs.html).

### LABORATORY RECRUITMENT – Opportunities for Laboratory employees.

**TB2102. ADMINISTRATIVE SERVICES ASSISTANT (A-2)** – Requires knowledge of BNL policies and procedures. Experience with web requisition entry, PeopleSoft procurement familiarity, Global Solutions and MP2, as well as the Microsoft Office Suite a plus. Will provide administrative, clerical and secretarial support for the Collider-Accelerator Administrative Group. Primary responsibilities include, but are not limited to, web requisitions and ILR processing, report distribution, telephone coverage, mail distribution, and filing. As the main point of contact, must be able to handle heavy volume of requisitions and ILRs for C-A and Magnet Division with meticulous attention to detail. Collider-Accelerator Department.

### OPEN RECRUITMENT – Opportunities for Laboratory employees and outside candidates.

**MK2445. POSTDOCTORAL RESEARCH ASSOCIATE** – Requires a Ph.D. in chemistry and experience in synthesis. Knowledge that could be applied to produce oligomers and polymers for charge transport is highly desirable. Research will explore synthesis and use of molecular materials that can function as nanoscale molecular wires that may have application in energy conversion and in molecular electronics. While production of new materials is central, will also have the opportunity to participate in experiments using the materials and possibly a number of other studies. Under the direction of J. Miller, Chemistry Department.

**MK2444. POSTDOCTORAL RESEARCH ASSOCIATE** – Requires a Ph.D. in chemistry, physics or materials science as well as great interest in, and ability to contribute to challenging new experiments at BNL-LEAF under minimum supervision. Experience in time-resolved pulse radiolysis or electron-transfer studies, ultrafast laser spectroscopy, design and construction of novel instruments especially involving fast kinetics and/or laser spectroscopy is highly desirable. Research will explore use of molecular materials that can function as nanoscale electronics. Opportunities exist to participate in a number of different studies that may include intramolecular electron transfer, excited states of radicals ions, and capture of electrons for holes prior to solvation. Under the direction of J. Miller, Chemistry Department.

**NS7236. EDUCATIONAL PROGRAMS ADMINISTRATOR (A-8)** – Requires a bachelor's degree in science, science education, or related field (master's degree preferred); experience teaching science at the secondary school level; a solid understanding of curriculum development concepts and the ability to develop a cooperative learning and working environment for students, teachers, and scientists with regard to educational program development. Knowledge of PowerPoint, Excel and Access is required; web design experience a plus. Duties include developing and administering programs for pre-service and in-service science teachers, and planning and conducting science contests and events. Office of Educational Programs. (ERAP eligible - \$1k)

**NS2455. SR. ADMINISTRATIVE SERVICES ASSISTANT (ESOL Coordinator, A-3 - term appointment)** – Requires excellent communication, interpersonal, and organization skills, the ability to work independently; ESOL certification and at least two years experience within the field. Computer literacy, the ability to develop correspondence, reports and spreadsheets (MS Word, Excel, Outlook, PowerPoint) necessary; knowledge of Laboratory policies and procedures a plus. Will be responsible for the development and oversight of the Lab's ESOL (English for Speakers of Other Languages) program. Will coordinate classes; assess student needs; orient and train tutors; maintain records/reports, develop materials; interact with user committees and generate announcements and articles to promote the program, as well as act as liaison between the Laboratory and Stony Brook University's ESOL programs. In addition, will support the activities of the Quality of Life Coordinator by providing administrative support as required. Director's Office.

**TB204.8 TECHNICIAN AIDE (TW-1 -Term Appointment, Reposting)** - Requires good mechanical skills, the ability to work with basic hand tools and shop machines. Good communication skills and the ability to work as part of a team are important. Tasks include installation of mechanical and vacuum parts. Accelerator Test Facility, National Synchrotron Light Source Department.

### Community Involvement

**BNL MUSIC CLUB MEMBERSHIP DRIVE** - 10/9, Berkner lobby, noon, all invited to listen, sign up, sit in. For more info., call Joe, Ext. 3846.

# 2001 Healthfest

BNL Health, Fitness & Safety Fair

attend Healthfest 2001 — scheduled for Monday through Thursday, October 15-19 — will not only use the information to improve their personal well-being, but also to decrease their risk of occupational injuries and illnesses.

On **Monday, October 15**, the festivities for employees will begin with the **2-mile Fitness Walk**. Rain or shine, it will start at noon and leave from the Science Education Center, Bldg. 438. Before the walk, an **Aerobic Stretch** will be held from 11:45 a.m.

Then, on **Tuesday, October 16**, the pace will be picked up with a **5-kilometer (3.1-mile) Fitness Run**. It will start at Biology, Bldg. 463, at 12:05 p.m., rain or shine. It will also be preceded by an **Aerobic Stretch** at 11:45 a.m.

The two-day **Health, Fitness & Safety Fair** will be held from 11 a.m. to 2 p.m. on **Wednesday and Thursday, October 17 & 18**. The fair will feature displays, demonstrations and health screenings. At the fair, on **Wednesday, October 17**, at noon, the featured presentation in Berkner Hall will be a **Stress Management Workshop**, while on **Thursday, October 18**, the lunchtime offering will be a **Reiki Workshop**.

During and after the fair, Healthfest athletic activities abound: On **Wednesday, October 17**, there will be two **Golf Clinics**, one from 11 a.m. to noon and a second from noon to 1 p.m. at the gazebo next to the ball fields, while **Jazzercise** will be offered in the gym, from noon to 1 p.m. On **Thursday, October 18**, there will be a **Tennis Clinic**, from 11:30 a.m. to 1 p.m., while **Cardio-kickboxing** will be offered in the gym, from noon to 1 p.m.

Finally, on **Friday, October 19**, Healthfest features a **5 or 8-mile Mountain Bike Ride**. It will start at the gazebo by the ball fields, at noon.

To register for any events, screenings, or workshops, submit the form below by Monday, October 8th.



### REGISTRATION FORM

I am signing up for the following: (check the appropriate boxes)

#### Aerobic Stretch (rain or shine)

- Mon., Oct. 15, 11:45  
 Tue., Oct. 16, 11:45

#### 2-mile Fitness Walk (rain or shine)

- Mon., Oct. 15, noon - 1 p.m.

#### 5-k Fitness Run (rain or shine)

- Tue., Oct. 16, 12:05-1 p.m.

sex:  female  male

age on day of run: \_\_\_\_\_

#### Podiatry Foot Screening

- Wed., Oct. 17, 11 a.m. - 2 p.m.  
 Thu., Oct. 18, 11 a.m. - 2 p.m.

Name: \_\_\_\_\_

Life #: \_\_\_\_\_ Ext.: \_\_\_\_\_

Dept./Div.: \_\_\_\_\_ Bldg.: \_\_\_\_\_

E-mail: \_\_\_\_\_

#### Hearing Screening

- Wed., Oct. 17, 11 a.m. - 2 p.m.

#### Massage & Reiki sessions

- Wed., Oct. 17, 11 a.m. - 2 p.m.  
 Thu., Oct. 18, 11 a.m. - 2 p.m.

#### Golf Skills Clinic

- Wed., Oct. 17  11 a.m. - noon  
 noon - 1 p.m.

#### Stress Management

- Wed., Oct. 17, noon - 1 p.m.

#### Jazzercise

- Wed., Oct. 17, noon - 1 p.m.

#### Tennis Skills & Play Workshop

- Thu., Oct. 18, 11:30 a.m. - 1 p.m.

#### Cardio-kickboxing

- Thu., Oct. 18, noon - 1 p.m.

#### Reiki Workshop

- Thu., Oct. 18, noon - 1 p.m.

#### Mountain Bike Ride

- Fri., Oct. 19, noon - 1 p.m.

COMPLETE AND RETURN FORM BY MONDAY, OCTOBER 7TH TO: MARY WOOD, BLDG. 490.