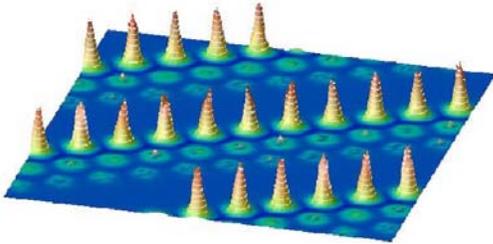




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New Computational Science Center Provides New Tools



Powerful computers are needed to capture, store, and analyze huge amounts of data. They can also generate informative and complex images, like this one showing the calculated spin density of cobalt nanowires on platinum.

- The Lab has formed a new Computational Science Center (CSC) to expand its computing capabilities in a number of sciences, including biology, physics, applied mathematics, and nanoscience.
- With a staff of 15 and a \$2 million annual budget, the new Center is funded, in part, by the U.S. Department of Energy's Office of Advanced Scientific Computing Research.
- At first, the CSC plans to assist researchers in computational biology, a growing field at the Lab and throughout the country in which scientists use computers to create interactive models of the complex biological systems they study.
- All of the Lab's big machines including its premiere physics facility, the Relativistic Heavy Ion Collider (RHIC), need sophisticated computing power. Ultra-fast computing will also be important to researchers, who will work at the Lab's Center for Functional Nanomaterials, when it opens in 2008.
- The Lab is also acquiring two massively parallel computers for nuclear and high-energy physics. Known as QCDOC, for quantum chromodynamics on a chip, these computers will be similar to IBM's Blue Gene/L, the world's fastest computer.

A First Step Toward Preventing *E. coli* Infections

- The bacterium *Escherichia coli* (*E. coli*) is often responsible for urinary-tract infections, one of the most common diseases in the U.S. For example, between 50 and 80 percent of U.S. women will experience a urinary-tract infection at least once during their lifetimes.
- Researchers from the Lab and Stony Brook University have determined the two-dimensional crystal structure of a membrane protein involved in the process by which *E. coli* infects human beings.
- In an infection's first stage, *E. coli* binds tightly to human kidney cells, using an "adhesive protein" secreted by the cells through a membrane protein "channel." The protein channel's structure helps to show how secretion occurs, which may lead researchers to finding a way to stop *E. coli* from attaching to the cell.
- Determining this protein structure is a first step to better understanding how an *E. coli* infection begins – and possibly, how to block it.

(over)

Hundreds Welcomed to Lab's "Sharing Our Caring" Volunteer Expo

- The Lab's Volunteers in Partnership (VIP) program committee recently welcomed over 300 people, including local community members, Lab employees, and retirees to its "Sharing Our Caring" Volunteer Expo event.
- Visitors learned about volunteer opportunities and services provided by 33 local charitable and community organizations, all of which had an affiliation with a Lab employee or retiree who shared in their work. Many Lab volunteers were also on hand to talk about their experiences.
- Brookhaven Science Associates (BSA), which manages the Lab for the U.S. Department of Energy, encourages employee volunteerism through its VIP program. In addition, during the Lab's annual United Way campaign that is now underway, BSA matches up to \$10,000 in funds for volunteer-hours donated by employees to United Way agencies.



April Gray, chair for the Volunteer Expo (second from right), looks at a brochure with Lab retiree Ella McLean (right), a Brookhaven Memorial Hospital volunteer. Joining them are Elieen Callihan (left), volunteer coordinator for Little Flower Children's Services, and Mardythe DiPirro, Associate Director for Peconic Community Council.

Red Cross Prepares Meals at Brookhaven Lab for Central Suffolk Seniors – Thanksgiving Feasts Were Delivered to More Than 650 Seniors

- Since 1985, the Lab has donated the use of a large, industrial-type kitchen in its Medical Department to the American Red Cross, for use in preparing weekday meals for senior citizens.
- Weekday mornings, kitchen aides prepare hot lunches for more than 650 central Suffolk County seniors, who are enrolled in their senior meal program administered through the Suffolk County Office for the Aging and funded by Suffolk County and New York State.
- Food is delivered in bulk from several distributors and cooked on the Lab premises before Red Cross staff and volunteers deliver it to homebound seniors and to senior centers.
- On November 23, seniors were treated to a special holiday turkey dinner, complete with stuffing, gravy, cranberry sauce, sweet potatoes, creamed spinach, dinner rolls, milk, and pumpkin pie.
- About 20 Lab employees volunteer their time each year for the program.