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Magnetic Resonance Imaging

- Magnetic resonance imaging (MRI) is a modern medical technology that is widely used to diagnose diseases. Brookhaven Lab's MRI scanner is on the cutting edge of imaging technology. Recent upgrades to the Lab's facility permit ultra fast MRI scans. One of the most exciting MRI techniques based on these scans is "functional MRI," which makes it possible to observe how a person "thinks."
- The brain is scanned rapidly (every few seconds) and repeatedly (typically 100 times) over the course of a few minutes while the researcher asks the individual in the scanner to do a task, move his or her fingers, generate words, memorize numbers, or make a decision. These tasks are alternated with periods of rest.
- In active brain regions, the blood flow and blood oxygenation increase while the task is being performed. Changes in blood oxygenation cause small changes in MRI signals, which can be detected and displayed. Many hours of computing time are necessary to process the data from a single one-hour scanning session, and approximately one gigabyte of data is generated from a single session.
- Scientists are using the Laboratory's MRI to study the function of the normal human brain, as well as the effects of multiple sclerosis, drug abuse, and HIV infection on brain function.

Physicists See Once-in-a-Trillion Event – Again!



Detector magnet used to identify decays

- After careful study of six trillion subatomic particle decays, an international collaboration of physicists announced that they have spotted one of the rarest occurrences in the subatomic world – for a second time.
- Understanding such rare decays is important to physicists attempting to learn how matter behaves at the most fundamental level, and may point the way to the discovery of new particles and forces.

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Nanoscience Workshop at Brookhaven Laboratory

- Nanotechnology is the science of manipulating materials on an atomic or molecular scale to develop novel materials and build microscopic devices. Nanotechnology today is where computer chip technology was 20 years ago. But many experts believe that nanotechnology represents the next major advance that will keep America at the forefront of science-based initiatives in manufacturing, electronics, chemistry, and related disciplines.
- Brookhaven National Laboratory has proposed to build a major nanoscience research center to be located here on Long Island. The Brookhaven Nanocenter is one of five research centers proposed by the U.S. Department of Energy (DOE), all to be located at DOE national laboratories. Interested participants will gather at the Lab March 8-9 to discuss plans for the Brookhaven facility. For more information, see www.bnl.gov.



NSLS with proposed Nanocenter extension at the right.

- The Brookhaven Nanocenter will complement the other DOE centers, coordinate with university centers supported by the National Science Foundation, and serve as a focal point for industrial researchers in the northeastern United States. The Brookhaven Nanocenter will greatly enhance scientists' ability to investigate the effects of nanoscale dimensions on materials' properties by providing new fabrication techniques, novel experimental probes, and other research tools.

Upcoming Events Open to the Public

Swinging Moose, March 6, Noon, Berkner Hall. Traditional folk music on hammered dulcimer, guitar, pennywhistle, fiddle, flute, English horn, electric bass, and all kinds of percussion. Free

Nanoscience Workshop, March 8-9, Berkner Hall. Workshop to describe future nanoscience research, discuss preliminary plans for a major nanoscience research facility, and gather input and feedback from potential users. Registration required, fee \$75, students \$25. Contact Grace Webster at (631) 344-3227 or gwebster@bnl.gov.

Zoe Browder, March 20, Noon, Berkner Hall. Zoe Browder is an advocate of contemporary music, and was the Lab's most popular pianist in 2000. She returns with an exciting solo program. Free

Stony Brook Opera, April 17, Noon, Berkner Hall. A performance preview of Monteverdi's exquisite "L'Incoronazione di Poppea" with accompaniment on period instruments. Free.

Due to heightened security, everyone who enters the Laboratory site must have a photo ID.