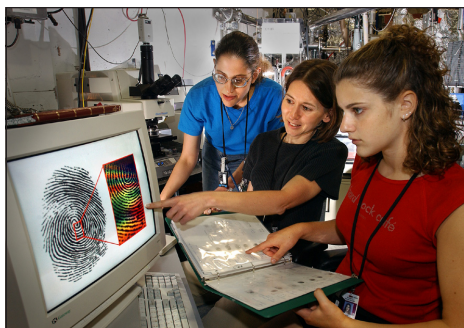


The Laboratory is operated by Brookhaven Science Associates, founded by Stony Brook University and Battelle. Six Nobel Prize-winning discoveries have been made at Brookhaven, and each year, some 5,000 visiting researchers from universities, industry, and other labs worldwide take advantage of BNL's unique facilities.

## Brookhaven Discoveries

For more than 60 years, Brookhaven National Laboratory has been one of the nation's — and the world's — leading research institutions. Much of the Lab's effort is directed at the study of the basic nature of matter, including subatomic particles and the structure of the atom. Some of the Lab's research has produced extraordinarily useful technology. Here are a few examples of Brookhaven Lab's practical innovations:



Brookhaven scientist Lisa Miller (center) mentors local students at BNL's National Synchrotron Light Source (NSLS), inspiring the next generation of U.S. scientists.

### Medical Marvels

- Technetium-99m, now used to diagnose heart disease and other ailments in more than 11 million people each year
- Synthetic insulin
- Promising addiction treatment, now in clinical trials
- Thallium-201, now used in hundreds of thousands of heart stress tests each year
- Studies of the Lyme disease protein used in a new, effective vaccine
- Use of L-dopa for the treatment of Parkinson's disease
- Important studies of the brain, including those uncovering the roots of psychiatric disorders, brain metabolism, and drug addiction (e.g., first images of cocaine's effects on the brain, discovery of enzyme deficit in smokers' brains)

### Technological Triumphs

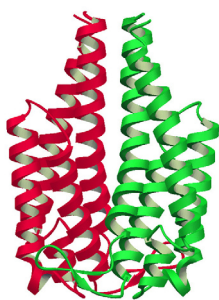
- Measured wear in engine parts, which led to the development of multi-grade motor oils such as 10W-30
- Invented better, cleaner, more efficient oil burners and devices to aid clean and efficient oil burning
- Studied environmental technologies and phenomena, including polymers used to clean oil spills

- Harnessed natural bacteria to clean up environmental pollution and purify crude oil
- Developed new techniques for encapsulating hazardous waste for storage and disposal with materials such as glass, plastic, and concrete

- Designed advanced computer chips
- Developed asbestos-digesting foam used to render asbestos harmless
- Built better batteries using advanced electrolyte materials
- Invented magnetically levitated (Maglev) trains
- Created advanced coatings for corrosion prevention
- Developed polymer composite materials for construction and road repair
- Designed polyplanar (flat panel) video display screen
- Developed a recyclable catalyst that can be recovered and reused with no waste, eliminating a need for solvents

### Basic Research Breakthroughs

- Recreated "perfect" liquid conditions of the early universe
- Discovered a rare arrangement of electric charge in a high-temperature superconductor
- First caused individual carbon nanotubes to emit light
- Twice observed a once-in-a-trillion decay of a kaon, a subatomic particle
- Conducted Nobel Prize-winning research on solar neutrinos, and how they change form on the way to Earth
- Created molecule-thick organic films on liquid mercury, helping build a foundation for the development of molecular electronics



A 3-D model of a Lyme disease protein, deciphered at Brookhaven.