

Along with four Nobel Prizes for advances in physics, Brookhaven Lab scientists are responsible for hundreds of discoveries, developments, inventions and innovations over the past 53 years.

## Brookhaven Discoveries

For more than 50 years, Brookhaven National Laboratory has been one of the nation's — and the world's — leading research institutions. Much of the Laboratory'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, however, has also produced extraordinarily useful technology. Here are a few examples of practical innovations developed at Brookhaven Lab:



Physicist Beatriz Noheda studies piezoelectric transducers.

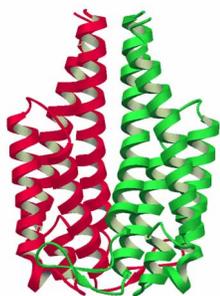
and drug addiction (e.g., first images of cocaine's effects on the brain, discovery of enzyme deficit in smokers' brains)

### Technological Triumphs

- Currently testing the space-worthiness of satellite and spacecraft parts with heavy ions produced in Brookhaven accelerators
- 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 up oil spills
- Researched the cause of mysterious "brown tide" algae blooms
- 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
- Magnetically levitated trains
- Created advanced coatings for corrosion prevention
- Developed polymer composite materials for construction and road repair
- Invented "quiet" jackhammer, which won a 2000 *Discover* Award
- Designed polyplanar (flat panel) video display screen

### 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
- 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
- Tin-117m, a promising agent for easing the pain of bone cancer without sedation; approximately 320,000 cases occur each year in the US alone
- Discovery that led to greater understanding of a new anti-clotting drug, increasing the drug's efficacy and contributing to the treatment of heart attack and stroke victims.
- Studies that led to the development of stents, which hold arteries open, improve blood flow and relieve symptoms
- Link between salt and hypertension
- Important studies of the brain, including those uncovering the roots of psychiatric disorders, brain metabolism



A three-dimensional model of a Lyme disease protein, deciphered at Brookhaven.