

CFN Building Design

Specialized Facilities for the Study of Nanoscience

Building Statistics & Features:

- Total of 94,500 square feet
- Designated LEED Building
- Vibration & noise controlled research areas
- Anti-static flooring in lab areas
- Use of aluminum and steel shielding in the main electrical switch gear room and service galleys
- Wet and dry lab areas
- 5,000 square feet of clean rooms with dedicated air-handlers
- Utility galleys
- 62 offices, 40 cubicles

Sponsor:

U.S. Department of Energy's Office of Basic Energy Sciences

Funding:

- \$81 million for construction and major equipment
- \$19 million annually for operations

Users:

An estimated 300 annually from academia, industry, and national laboratories

<http://www.bnl.gov/cfn>

The Center for Functional Nanomaterials (CFN) at Brookhaven National Laboratory provides state-of-the-art capabilities for the fabrication and study of nanoscale materials, with an emphasis on atomic-level tailoring to achieve desired properties and functions.



Brookhaven's Center for Functional Nanomaterials

To avoid radio frequency and electronic magnet interferences, aluminum and steel shielding has been installed at the CFN. The building also has anti-static flooring, and "drop-

down" utility carriages that provide the power supply to all the laboratories. A similar system exists for vacuum and compressed air.

High-tech tools

The CFN, a 94,500 square foot facility, will house some of the world's most intricate and complicated scientific tools, including a Scanning Transmission Electron Microscope (STEM), a Low Energy Electron Microscope (LEEM), a proximal nanoprobe, and an electron beam lithography laboratory — all of which will enhance research in the areas of nanocatalysis, the study of biological and electronic nanomaterials, and theory and computation. These tools and other major equipment totaling \$25 million will be installed at the CFN during 2007.

The building also houses 5,000 square feet of "clean room areas," which have mechanical space with dedicated air handling units to filter the air and keep air particulates to very low levels. Sixty-two offices and 40 cubicles provide workspace for scientists and support staff.

Design characteristics

To ensure optimal performance, the CFN has some built-in design characteristics. For instance, because the mere existence of body heat can affect the ambient conditions in the STEM lab, controls there are adjustable to 0.1 degrees Celsius for temperature and within 5 percent for humidity.

Green building

The CFN has been registered with the United States Green Building Council as a LEED building, for Leadership in Energy and Environmental Design. LEED is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings, which offers building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance. LEED promotes performance in five areas of human and environmental health: sustainable site development (such as erosion control and storm water management), water savings, energy efficiency, materials selection, and indoor environmental quality.

Additionally, the STEM is so sensitive to vibration that vehicles driving on nearby roadways can cause interference. To help absorb noise and vibration, 24-inch isolated concrete slabs have been constructed in some specialized labs and polypropylene fibers have been added to certain slabs to dampen the noise.

The CFN will meet all of the LEED requirements including state-of-the-art heating and ventilation equipment, roofing materials designed for energy conservation, and noise and vibration sensitive concrete slabs.

