

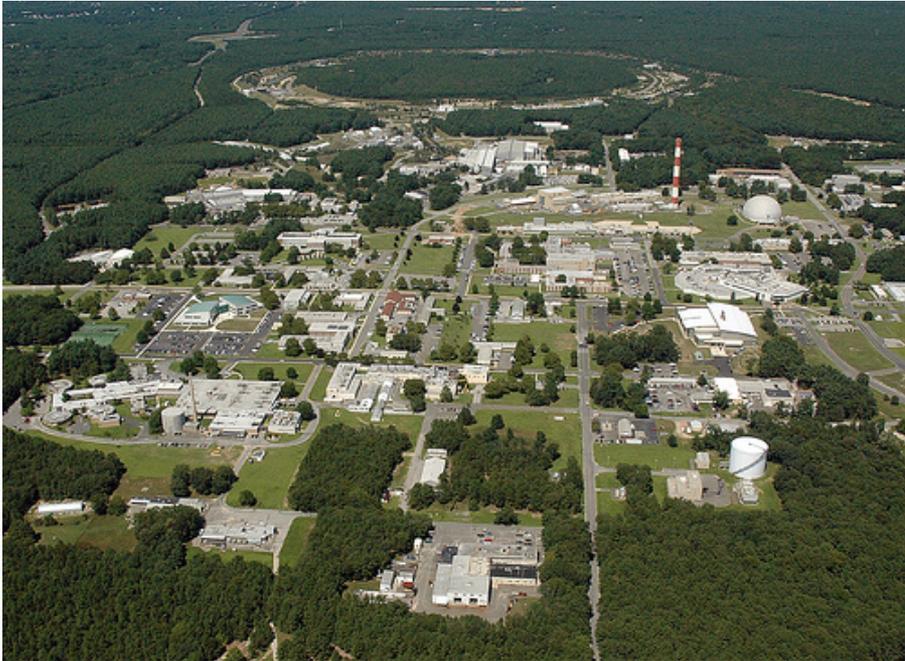
Aerospace and Defense Technologies at BNL

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Office of Technology Commercialization and Partnerships



BNL is located on Long Island, about 2 hours' travel east of Manhattan.



- 1 of 17 DOE Labs
- 2,815 employees
- \$515.8 million / year
- Multi-purpose
- Basic science focus
 - Moving toward deployment
- Design, build, and operate user facilities for the world's scientific community

DOE Mission

Discover the Solutions that Power and Secure America's Future

BNL Approach

An integrated, interdisciplinary approach among S&T programs, facilities, and collaborators



RHIC I, II



CFN



NLSLS I, II, JPSI

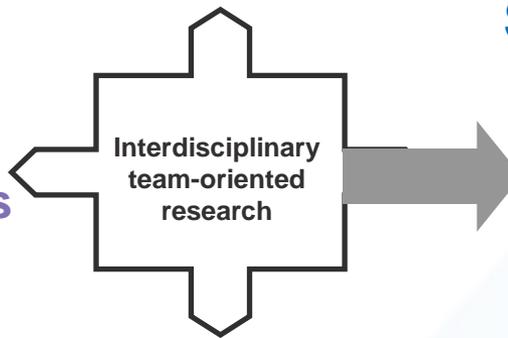


NY Blue

Facilities

Science Challenges

Core programs



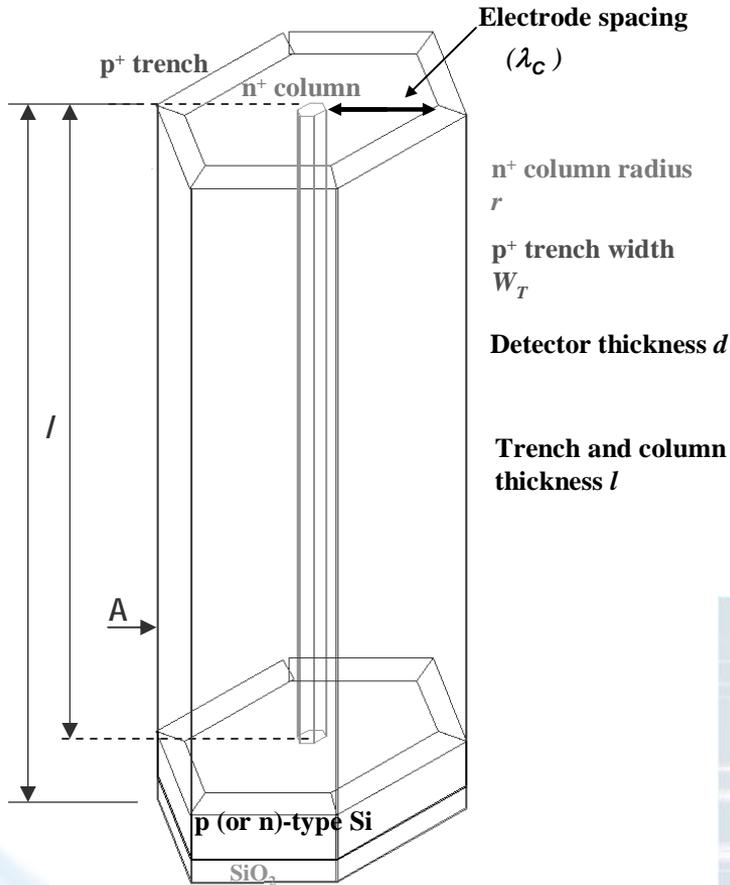
- Energy Security / Climate Change
- Origins of the Universe
- Accelerator Science / Detectors
- Human Health / Environment
- National Security

Collaborators, Users



SBU, Columbia, Cornell, Yale, CERN, ... IBM, Dow, GE, Exxon, Toyota, GM, ...

Radiation Detectors



Si-based

High-pressure Xenon-filled

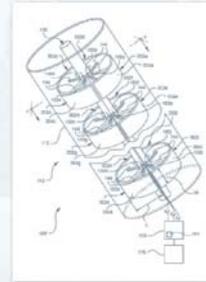


TECHNOLOGY

High-pressure xenon (HPXe) radiation detectors often suffer from extreme sensitivity to electrical and acoustic noise. This new design reduces the detector's sensitivity to noise by reducing its internal capacitance, leading to improved performance.

APPLICATIONS

HPXe radiation detectors are suitable for stand-off systems for detection of illicit radioactive material at points of entry, bridges, gates, ports, and other facilities. Higher resolution detectors will broaden their field of applicability.

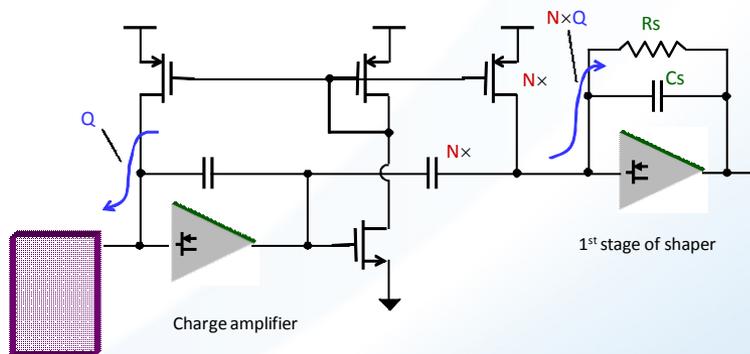
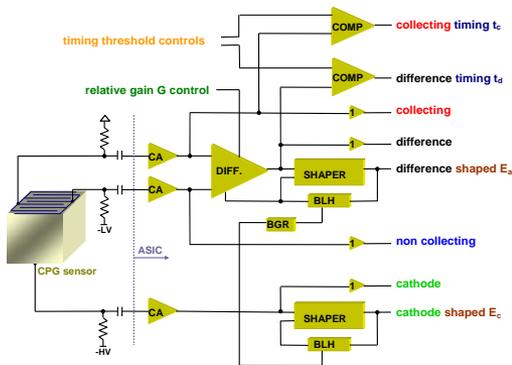
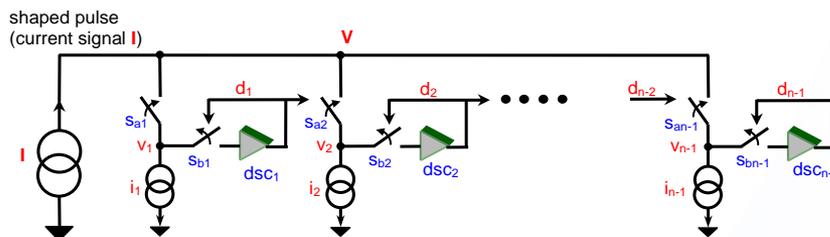


TECHNOLOGY

Cadmium zinc telluride (CZT) radiation detectors can operate with high resolution at room temperature when implemented in this virtual Frisch grid configuration.

CdZnTe-based

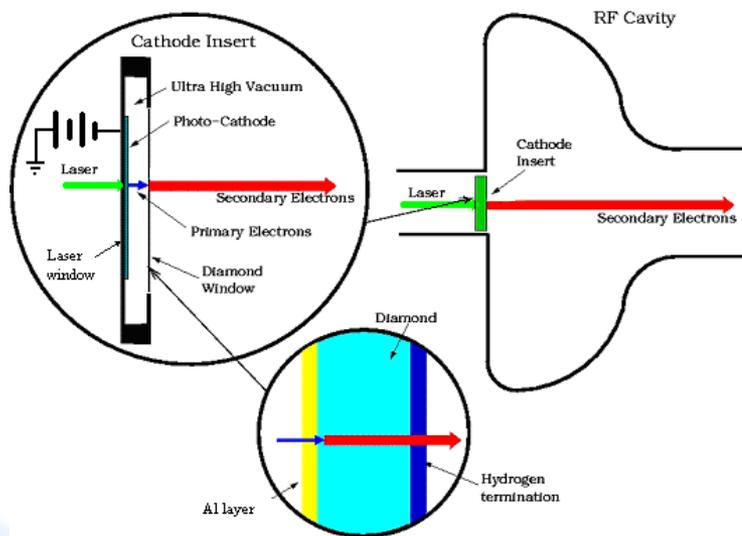
Electronics – Circuit Designs



Instrumentation

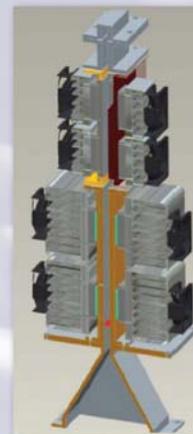
Aerosol composition and size distribution monitors

Photocathode designs



PRODUCT

The basic technology is an aerosol mobility size spectrometer capable of measuring ambient particle size distribution. The technology can also be used to build an analytical instrument for applications in specific fields to measure aerosol size distribution with high time resolution (about 1 second) and size resolution (less than 100 nm in diameter) with a high signal-to-noise ratio.



COMPETITIVE ADVANTAGE

This spectrometer is an important addition to the currently available particle size analyzers due to its speed and ability to detect aerosol particles smaller than 100 nm in diameter – a size which is dominant in the atmosphere and prevalent in various applications. No prior knowledge about the refractive index of the aerosol particles is necessary to execute this technique.

APPLICATIONS

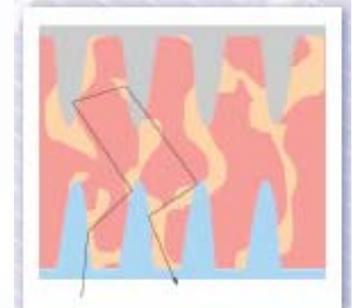
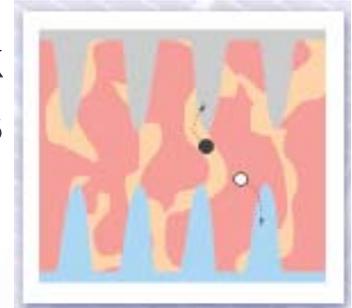
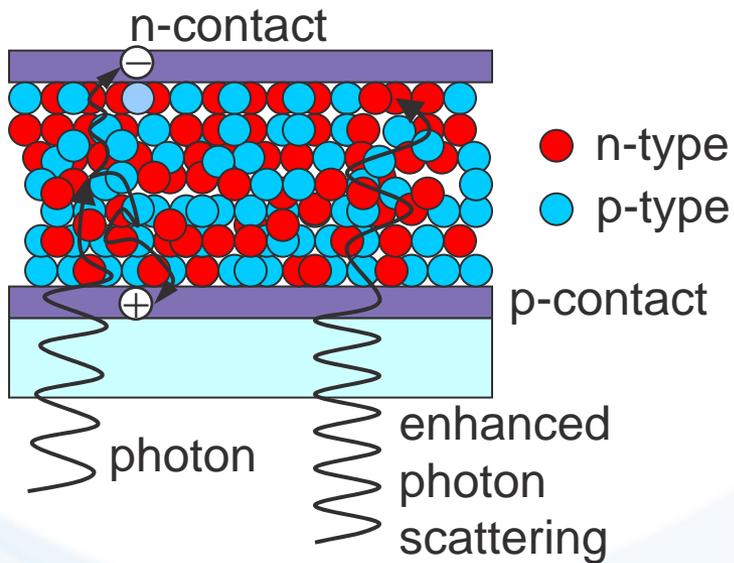


The aerosol mobility size spectrometer is applicable in a broad range of fields including the environmental, atmospheric (climate), and inhalant (pharmaceutical and medical device) fields.

Energy Generation

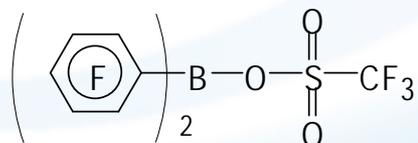
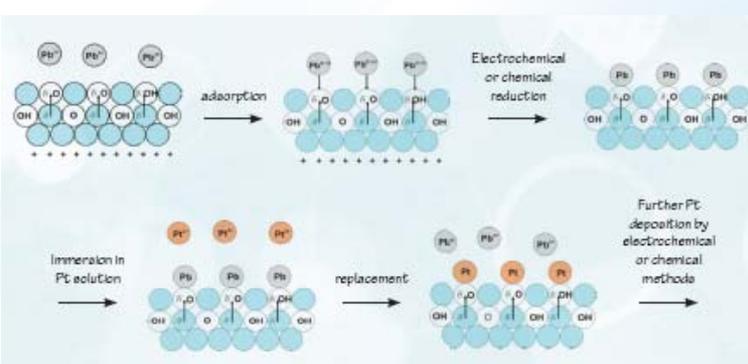
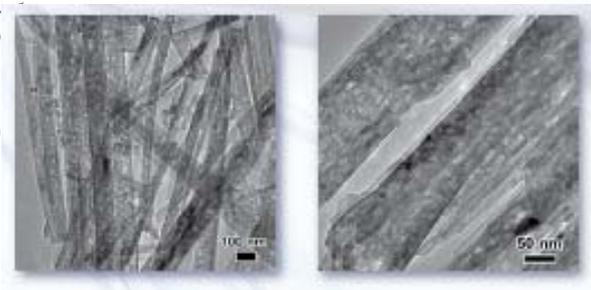
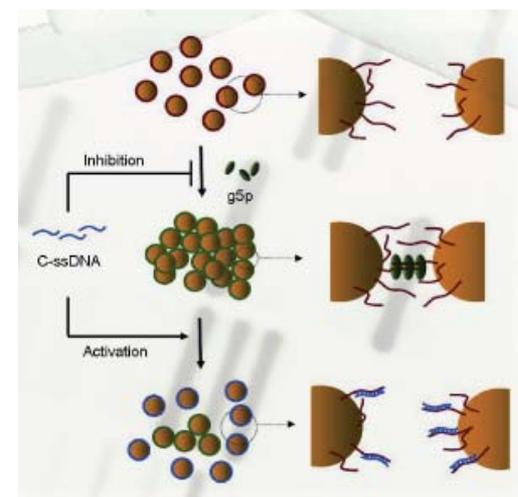
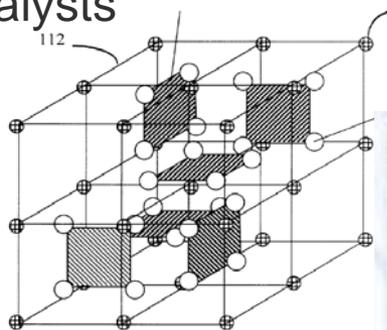
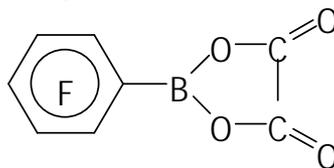
Electrode design for bulk heterojunction PV cells

Inorganic Nanocrystal BHJs



Specialty Materials

- Hydrides for hydrogen storage
- Low-platinum fuel cell catalysts
- High-ZT thermoelectric materials
- Non-aqueous battery electrolytes, anion receptors, and additives
- Li-ion battery anode materials
- Ultraviolet-protective nanoparticles
- Nanoscale architectures for biological and chemical sensors



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