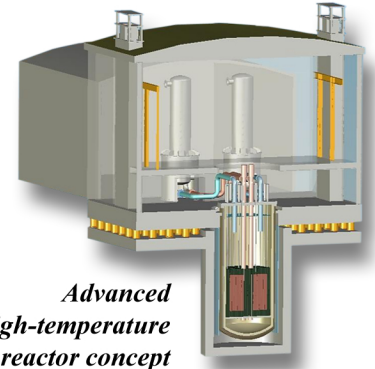


# Nuclear Science and Technology Division

**T**he Nuclear Science and Technology Division at Oak Ridge National Laboratory is committed to being the premier supplier of comprehensive, leading-edge science, technology, and engineering research to both government and industrial sponsors.



*Advanced  
high-temperature  
reactor concept*

## Capabilities

NSTD is the largest research division at ORNL, with more than 300 technical staff.

*Key facilities used in research include the following:*

- Radiochemical Engineering Development Center
- Californium User Facility for Neutron Science
- Oak Ridge Electron Linear Accelerator (ORELA)
- Safeguards Laboratory
- High Flux Isotope Reactor



*Supporting the Spallation Neutron Source  
and the High Flux Isotope Reactor for basic  
research on the nature of materials*

## Nuclear Systems Analysis, Design, and Safety

NSTD is solving a wide range of critical problems in nuclear science and engineering technology through application of computational and experimental modeling and experience with operating nuclear systems. State-of-the-art solutions are developed through integrated capabilities in these areas:

- Nuclear reactor systems
- Nuclear computational methods and data
- Nuclear safety
- Irradiation experiment design
- Space fission technology



*Spacecraft Galileo  
powered by  $^{238}\text{Pu}$*

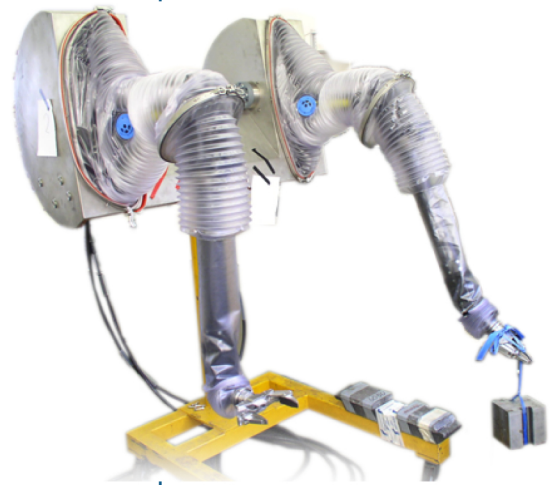
## Fuels, Isotopes, and Nuclear Materials

Our research teams are advancing the applications of medical, industrial, and research isotopes; developing separation sciences for the processing of isotopes and nuclear materials, including spent fuel recycling; and designing robotic systems and unique facilities for the safe handling of nuclear materials. Some examples are the following:

- Nuclear materials processing and equipment design
- Robotics and remote handling
- Separation science and technology
- Medical isotope development
- Stable and radioactive isotopes
- Heavy element production
- Nuclear fuels



*Sol-Gel microsphere fuel preparation*



*Advanced servomanipulator systems*



*Aiding Russia to safeguard weapons material*

## Nuclear Security Technologies

NSTD is strengthening U.S. national security and enhancing global stability through the application of innovative and responsive technical expertise and technology to detect, prevent, and reverse the proliferation of weapons of mass destruction worldwide. NSTD staff lead and implement many of the critical efforts for the Nuclear Non-Proliferation Program Office, including the following:

- Material protection, control, and accounting
- Highly enriched uranium transparency
- Plutonium disposition
- International safeguards
- Export license review
- Removing and securing nuclear materials at risk



*Detecting nuclear material in weapons*

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