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<i>Title:</i>	Laboratory Overview
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<i>Intended for:</i>	Senator Bingaman's Staff and Community Leaders



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## **Laboratory Overview**

**Duncan W. McBranch**

Members from Senator Bingaman's staff and various community leaders will be provided a general laboratory update on science and energy programs.

# Laboratory Overview

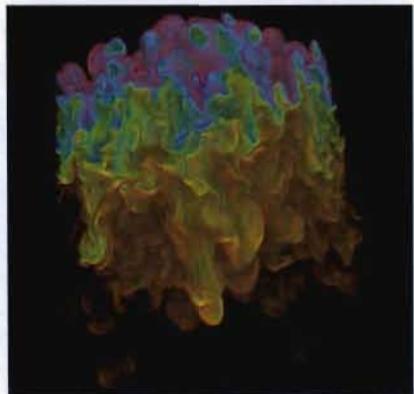
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Duncan W. McBranch  
Deputy Principal Associate Director for  
Science, Technology and Engineering

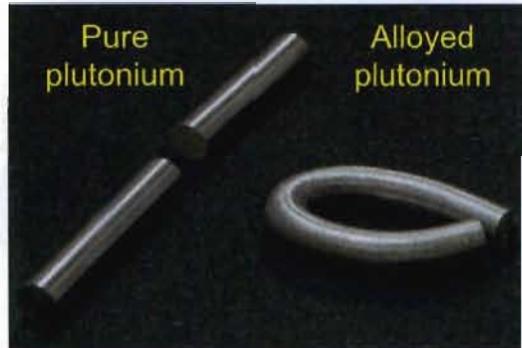
*June 2, 2011*

# Science at Los Alamos National Laboratory

## Stockpile Stewardship



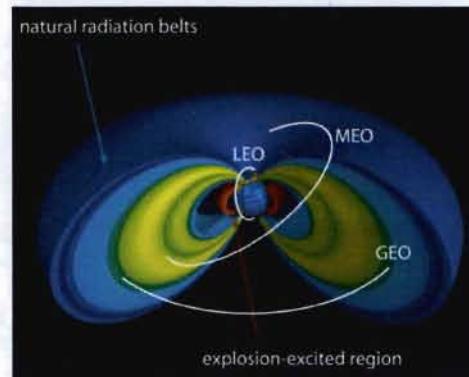
**Hydrodynamics:** Turbulence



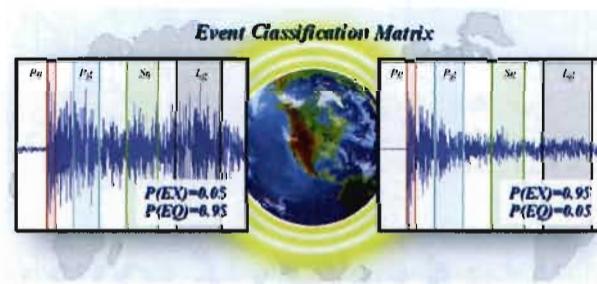
**Plutonium Science:** Metallurgy



## Global Security



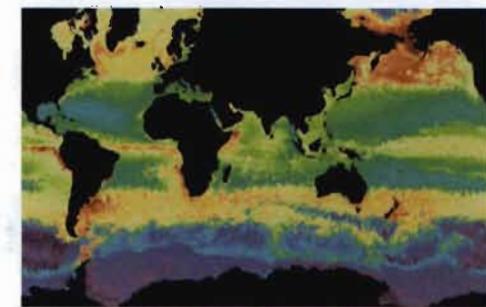
**Threats from Space:** Dynamic Radiation Environment Assimilation Model



**Seismic Detection of Nuclear Explosions**

UNCLASSIFIED

## Energy Security



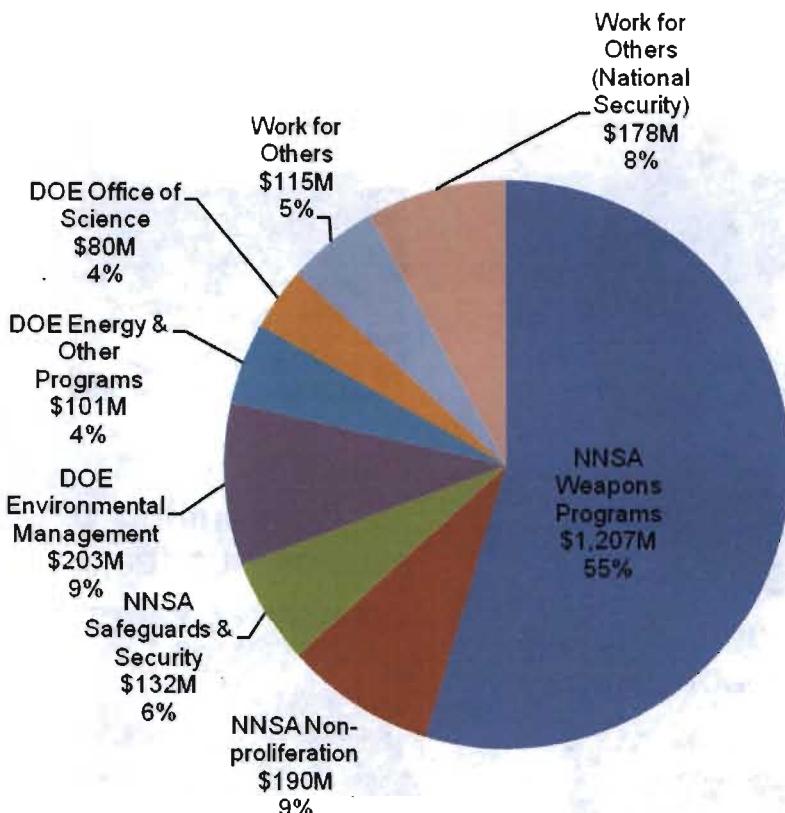
**Climate/Energy Impacts:** Simulation and prediction



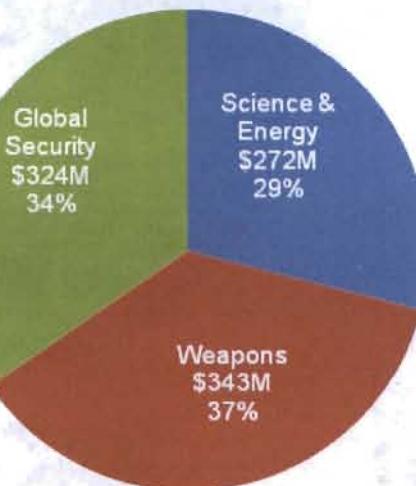
**Materials:** Energy generation and transmission

# FY10 Laboratory Budget

The Lab's FY10 annual budget was approximately \$2.2 Billion\*



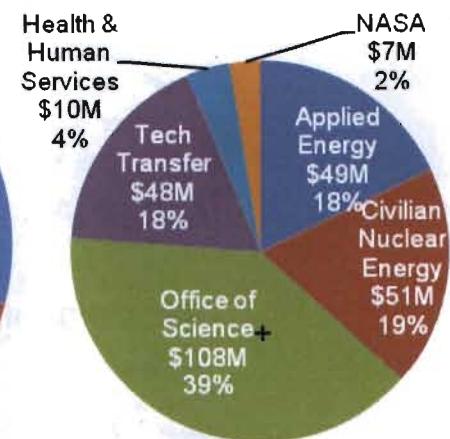
\*does not include Stimulus



Laboratory's R&D Funding: \$939M\*\*

\*\*includes \$31M of Stimulus

Science & Energy Funding: \$273M\*\*



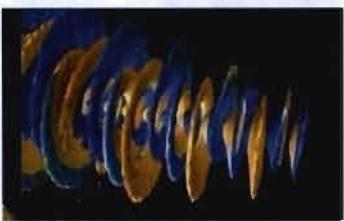
+ Includes Genome, Tropical Western Pacific, and Stimulus  
\*\*includes \$31M of Stimulus

# Capabilities

## Diverse ST&E capabilities are needed to perform the Laboratory's national security missions



Weapons Science & Engineering



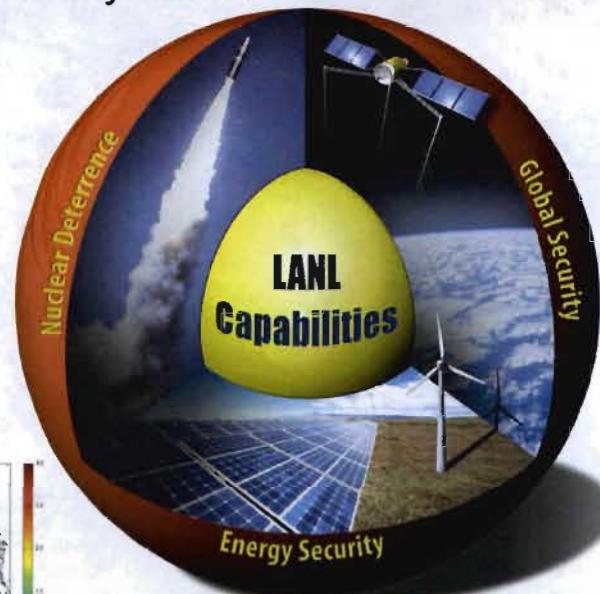
Computational Physics & Applied Mathematics



Information & Knowledge Science



Accelerators & Electrodynamics

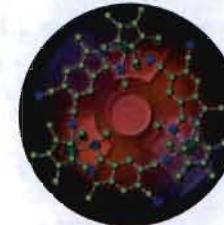


Materials

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Biosciences

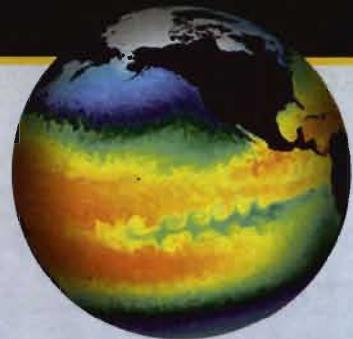


Chemical Science



Earth & Space Sciences

# Los Alamos Energy Security focus areas

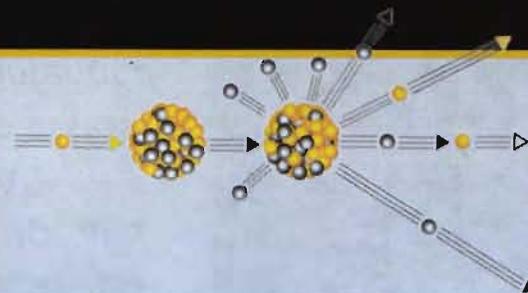


## Impacts of Energy Demand Growth

- Coupled predictive models for climate, infrastructure impact analysis
- Prediction of abrupt change at multiple scales (regional to global)
- Global security and policy implications

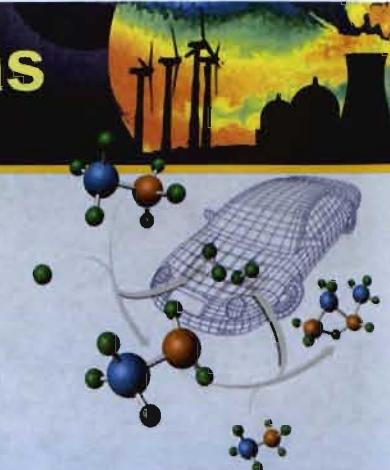


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EST. 1943



## Sustainable Nuclear Energy

- Efficient extraction of energy content from fuel
- Nonproliferation & safeguards
- Effective waste management



## Concepts and Materials for Clean Energy

- Energy storage, generation, and transmission
- Biofuels and fuel cells
- Clean fossil energy

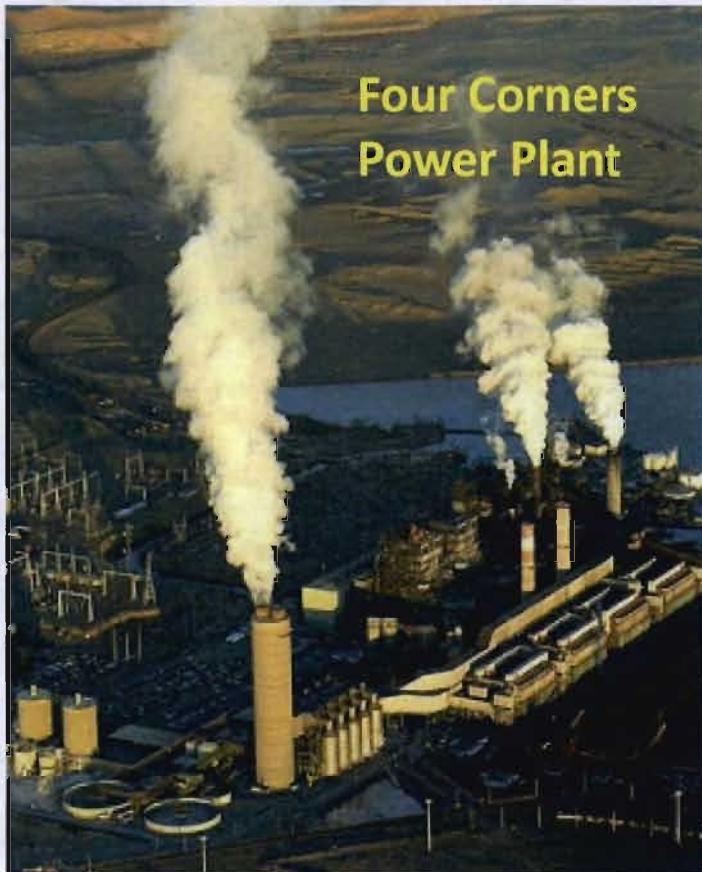


U N C L A S S I F I E D

Slide 2



# Four-corners pilot: CO<sub>2</sub> attribution & scaling

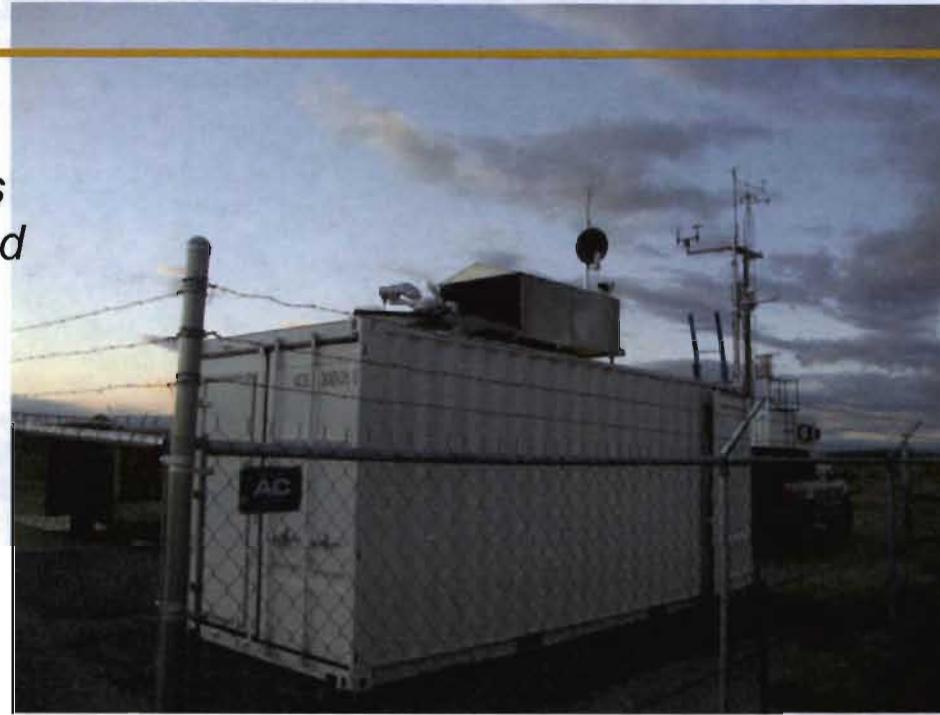


*We are combining column CO<sub>2</sub>, NO<sub>2</sub> and CO observations using FTS, GOSAT, SCIAMACHY and MOPITT data to assess the ability of remote sensing to infer and attribute CO<sub>2</sub> emissions from a power plant.*



# First Solar FTS to Monitor Power Plant Operational San Juan NM

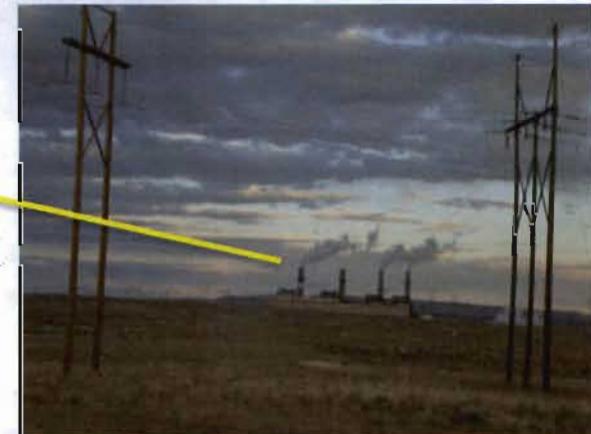
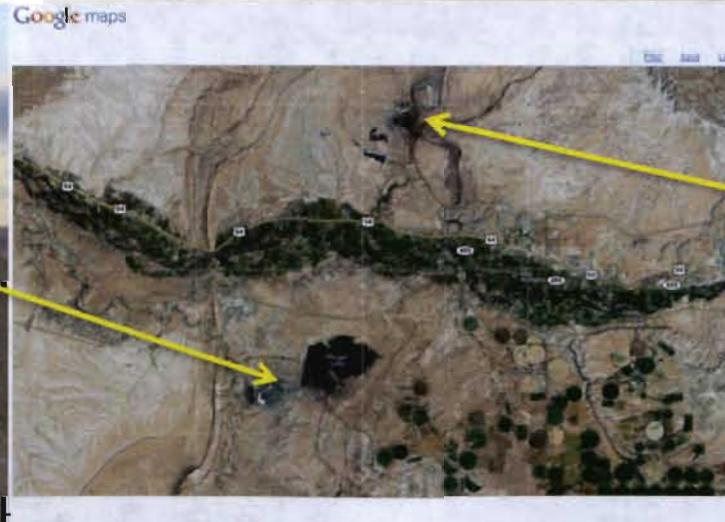
*Goal: Separate CO<sub>2</sub> contributions from high NO<sub>x</sub> and low NO<sub>x</sub> sources using FTS data*



[https://tccn-wiki.caltech.edu/Sites/Four\\_Corners](https://tccn-wiki.caltech.edu/Sites/Four_Corners)

Four Corners PP  
High NO<sub>x</sub>/CO<sub>2</sub>

San Juan PP  
Low NO<sub>x</sub>/CO<sub>2</sub>



# Los Alamos Science in the 21st Century

The nation's investment in Los Alamos has fostered scientific capabilities for national security missions.

As the Premier National Security Science Laboratory, Los Alamos tackles:

- Multidisciplinary science, technology, and engineering challenges
- Problems demanding unique experimental and computational facilities
- Highly complex national security issues requiring fundamental breakthroughs

