Industrial Partnerships at Sandia National Laboratories

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Sandia National Laboratories

Multiprogram National Security Laboratory

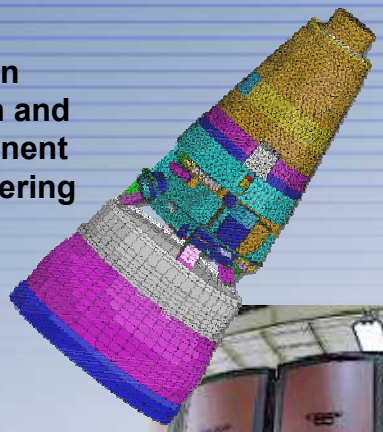
National Security

Sandia National Laboratories

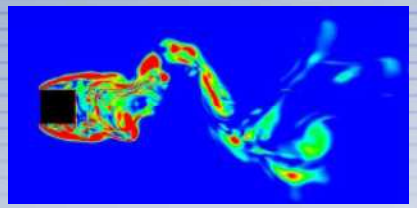
Science & Engineering

Sandia's Nuclear Weapons Mission

Weapon system and component engineering

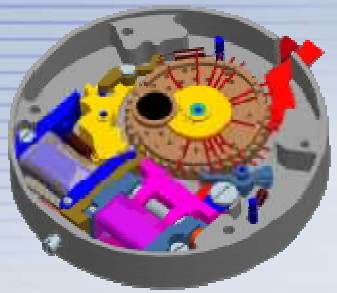


Stockpile and Complex Transformation



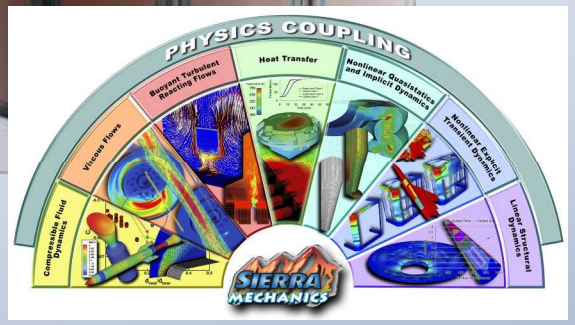
Modeling and simulation

Enhancing the safety and security of the stockpile



Testing and evaluation

Production and responsive infrastructure



SIERRA Mechanics

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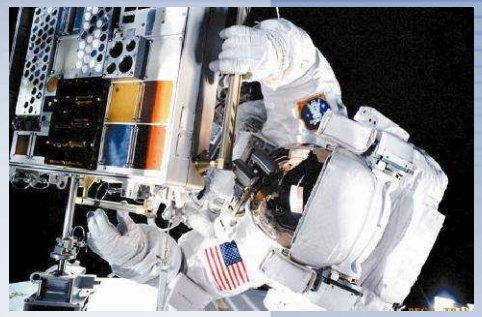
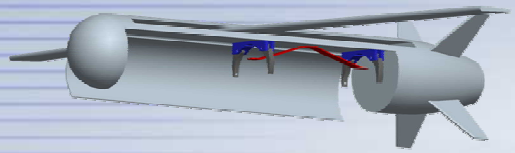
Defense Systems & Assessments

Materials International Space Station Experiment

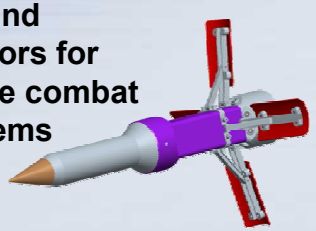


Real-time SAR images

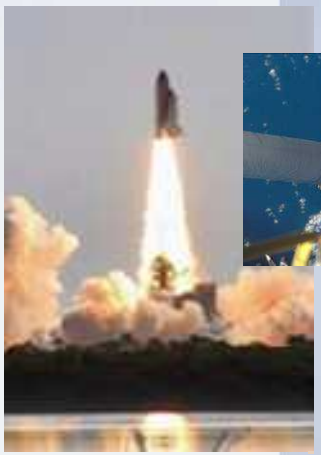
Predator UAV with SAR



Ground sensors for future combat systems

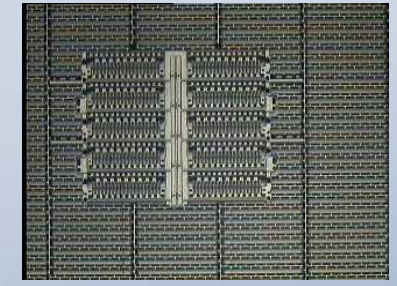


Small robotic vehicle



Shuttle return to flight

MEMS louvers

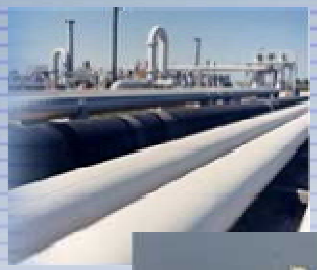


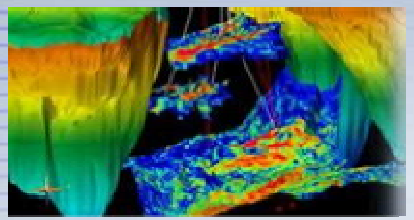
Target launch for Ballistic Missile Defense

Energy, Resources & Nonproliferation

Energy efficiency, and environmental stewardship

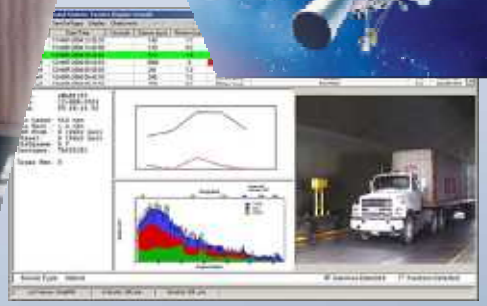
Safe, secure, reliable energy supply and infrastructure





Energy and water interdependency

Nonproliferation



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Homeland Security & Defense

Airport security

Maritime security

Energy supply

Infrastructure security

Physical security, base protection

National Security Concerns

Nuclear Weapons

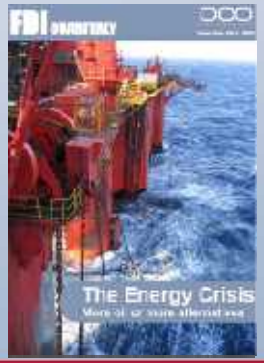
Nonproliferation

Energy

Nuclear Power

Homeland Security

Supporting the Warfighter



Science at Risk

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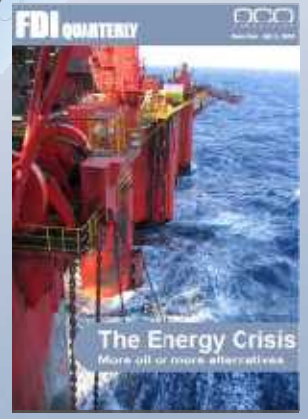
Future challenges are varied and complex

WMD

Nuclear Surety

Cyber Security



Energy

Sandia National Laboratories

ST&E and Technology Partnerships Enable Sandia's National Security Mission Areas

Integrated Technologies and Systems

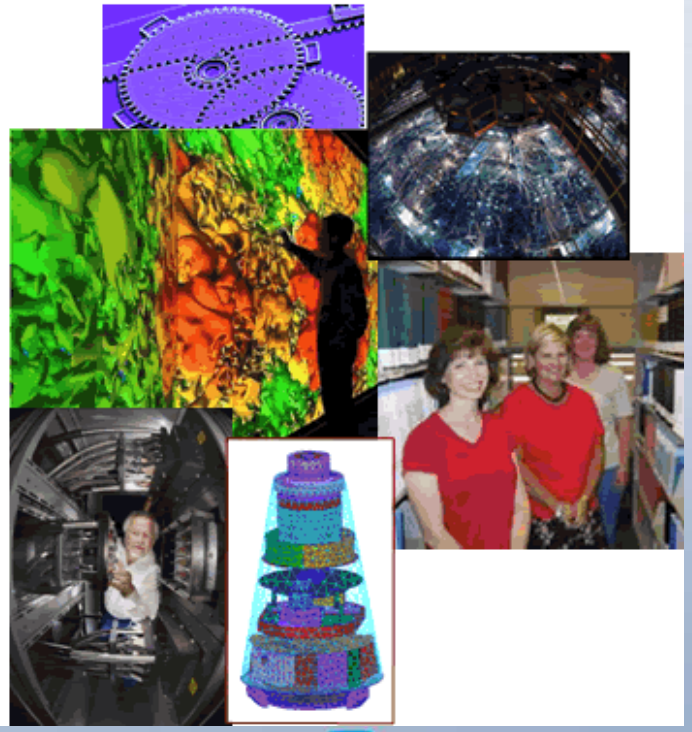
- *Energy, Resources, and Nonproliferation*
- *Homeland Security & Defense*
- *Defense Systems & Assessments*

Nuclear Weapons

- *Nuclear Weapons*

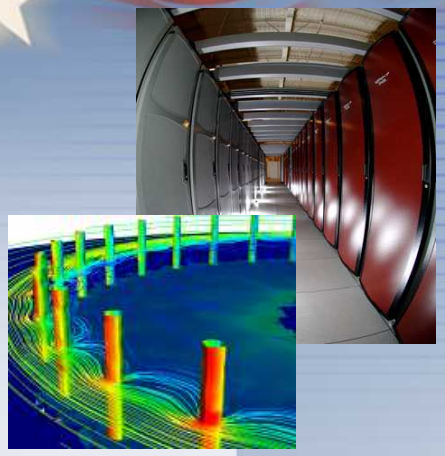
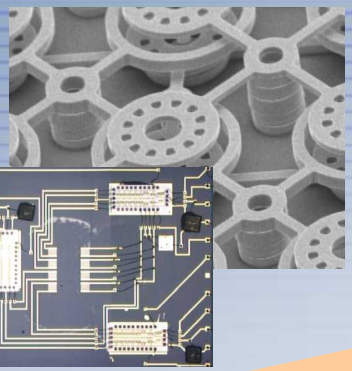
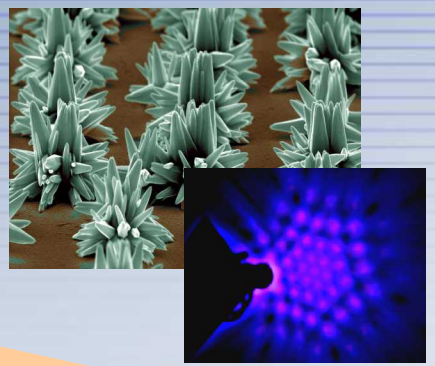
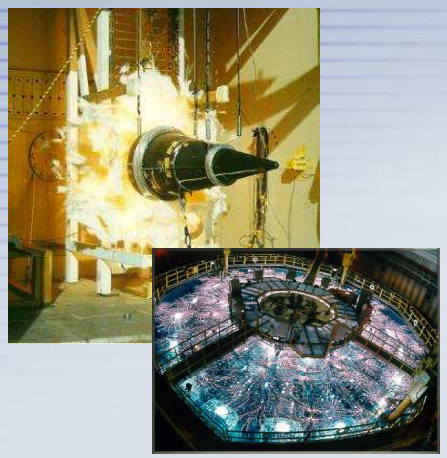
Laboratory Transformation

- *Science, Technology, and Engineering*
- *Integrated Enabling Services*



Sandia's capabilities are underpinned by six research disciplines

Strategic Capabilities

High Performance Computing

Microsystems

Nanotechnology

Extreme Environments

Computer Science

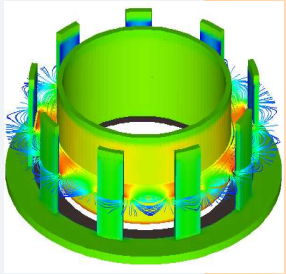
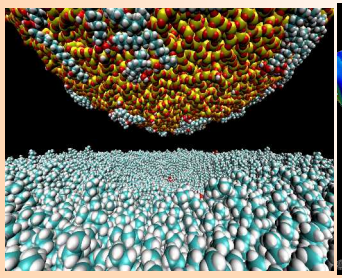
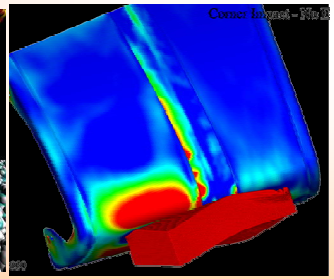
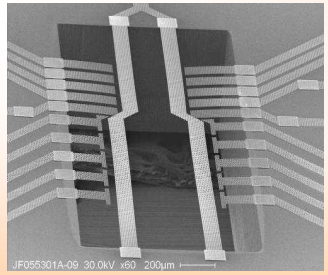
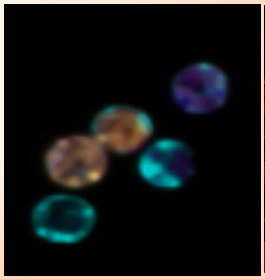
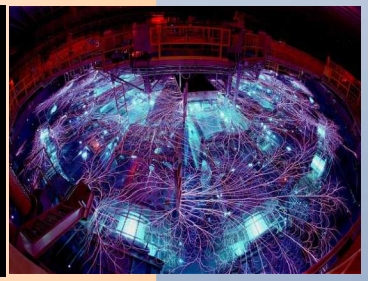
Materials

Engineering Sciences

Micro Devices

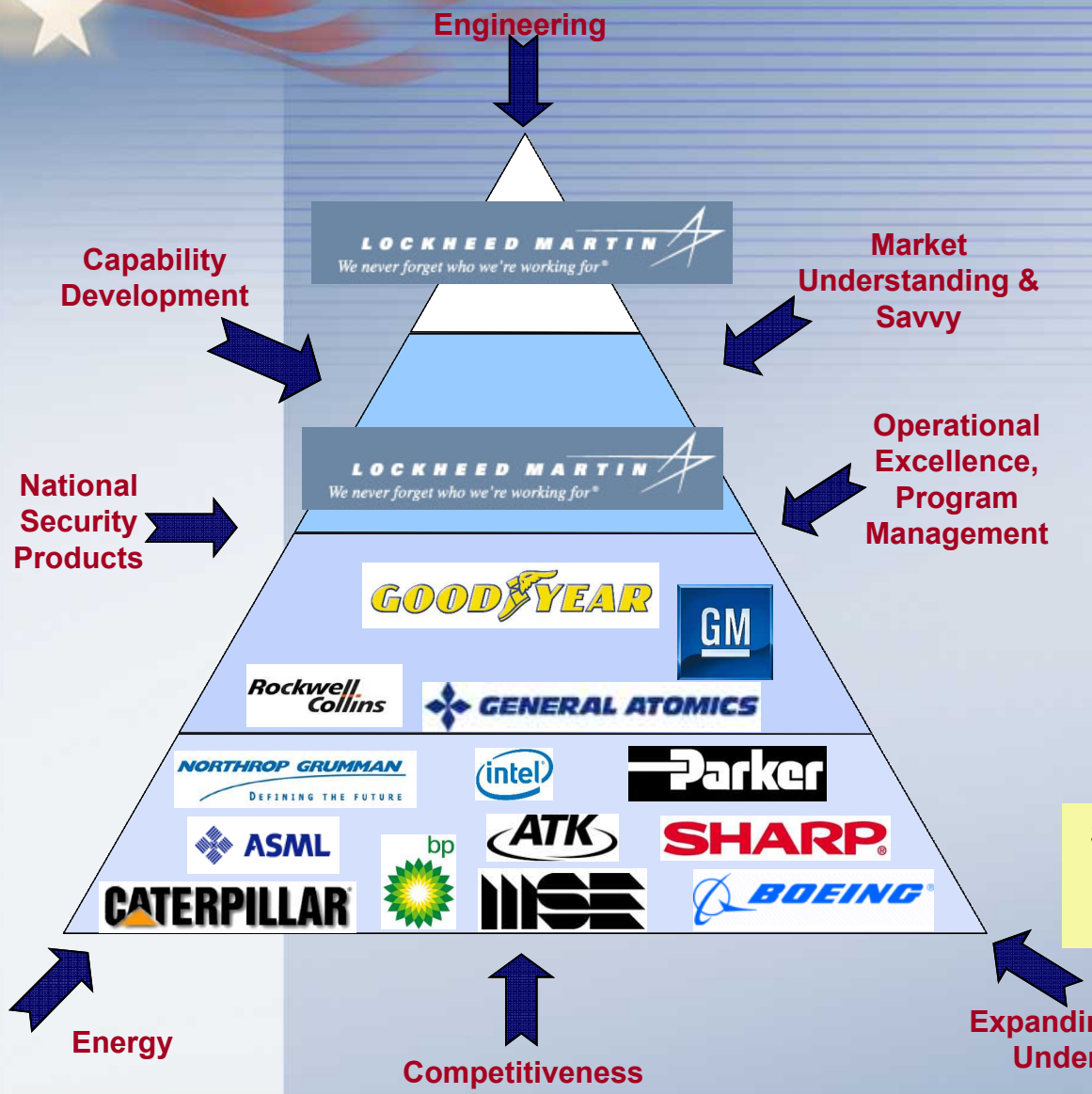
Bioscience

Pulsed Power

Research Disciplines

Our Industrial partnerships benefit both industry and Sandia



Benefits to Sandia

- More robust and mature Sandia technology
- New capabilities for application to weapons problems
- New insights into weapon applications from looking at them from a new perspective
- Insights into transformation of design processes and cultures from industry
- Metrics on the value and quality of Sandia technology
- Extended value for tax-payers dollars to national economic security
- Broadening of technical staff experience on new and different applications
- Improved supplier base for weapons needs

Sandia continues to lead the complex in numbers of & funds from industrial partnerships

Sandia National Laboratories

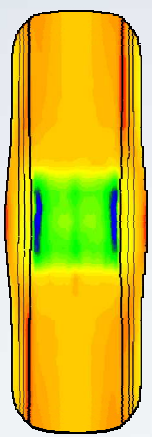
The Sandia/Goodyear Technology Partnership

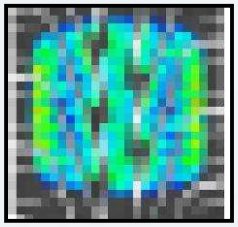
Develop and validate computational mechanics (finite element) tools for predicting structural, thermal, and fluid response of viscoelastic systems during manufacturing and use

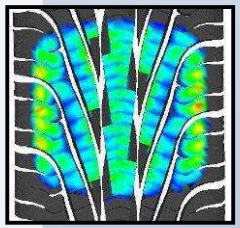
Technology Breakthrough 1994-1996

"The Pneumatic Tire Represents One of the Most Formidable Challenges in Computational Mechanics Today"

A. Noor, Journal of Computers and Structures





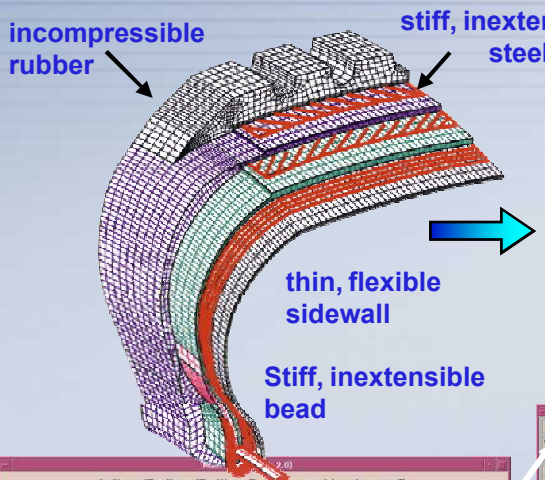


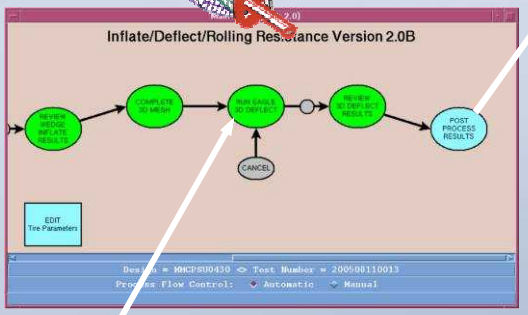
Before

After

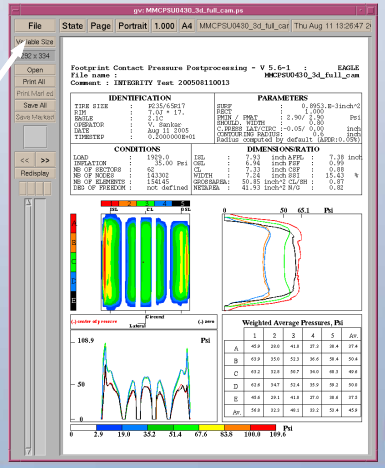
Technology Maturation 1997-2003

Traditional Build/Test Product Development – 2-3 Years





Automated Simulation Process



Innovative New Products 2004 - Future

Today 100% of the tire designs at Goodyear are modeled *before* molds are ordered.

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