

Recruiting Opportunities Oak Ridge National Laboratory

Shelly Hunt Lohmann

ORNL Overview

Employment and Student Opportunities

January 2010



U.S. DEPARTMENT OF
ENERGY

 **OAK RIDGE NATIONAL LABORATORY**
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Energy is the defining challenge of our time

- The major driver for
 - Climate change
 - National security
 - Economic competitiveness
 - Quality of life
- Incremental changes to existing technologies cannot meet this challenge
 - Transformational advances in energy technologies are needed
 - Critically dependent on the best science and technology

Global energy consumption will increase 50% by 2030

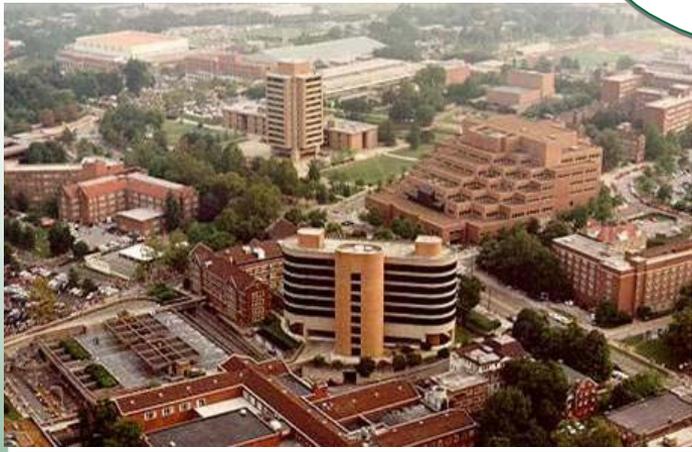
A clean energy future: The President's vision

- Reduce greenhouse gas emissions 80% by 2050
- Increase electricity from renewable sources
 - To 10% by 2012
 - To 25% by 2025
- Put 1 million plug-in hybrid cars on the road by 2015
- Within 10 years, reduce oil consumption by the amount that we currently import from the Middle East and Venezuela



What is ORNL's
role in delivering
on
these promises?

UT-Battelle has managed ORNL since April 2000



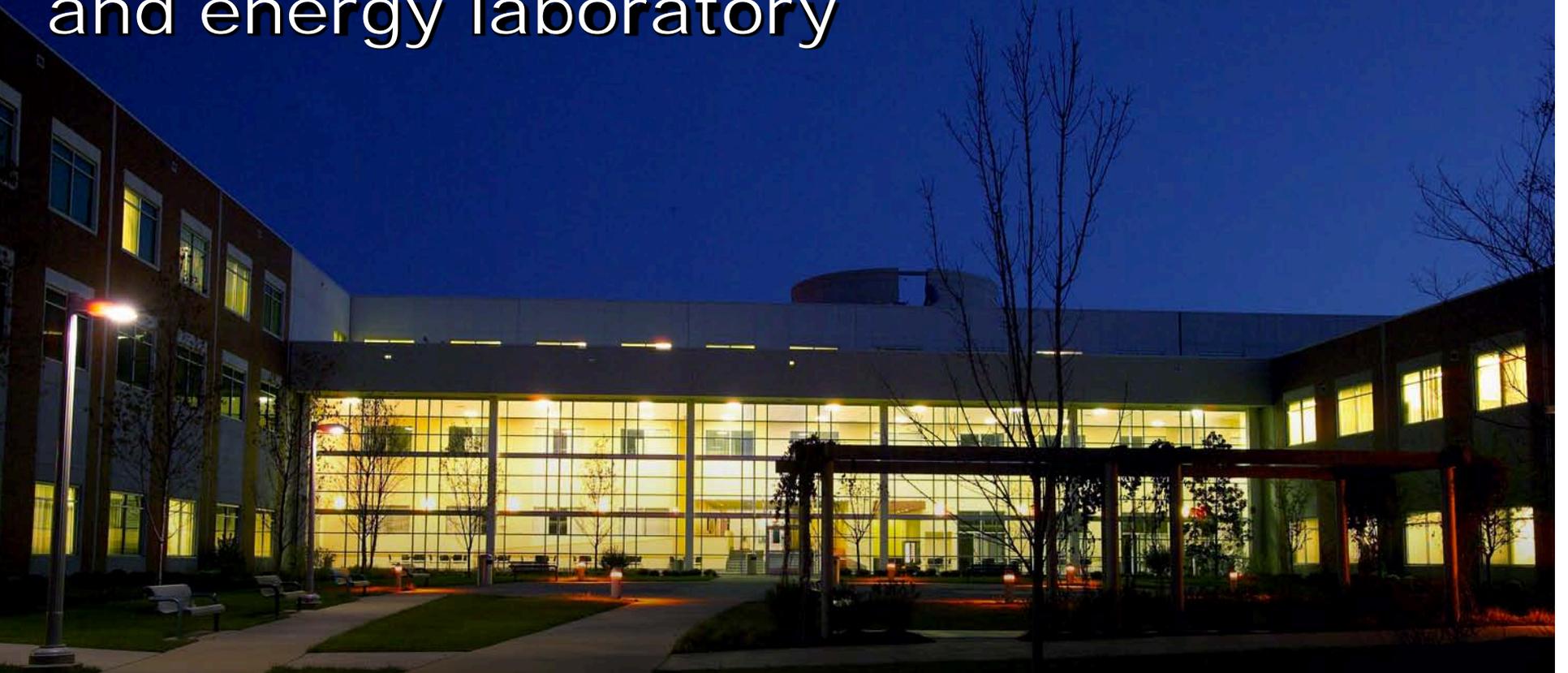
**The University of Tennessee
Knoxville, Tennessee**



**Battelle
Columbus, Ohio**



Today, ORNL is DOE's largest science and energy laboratory

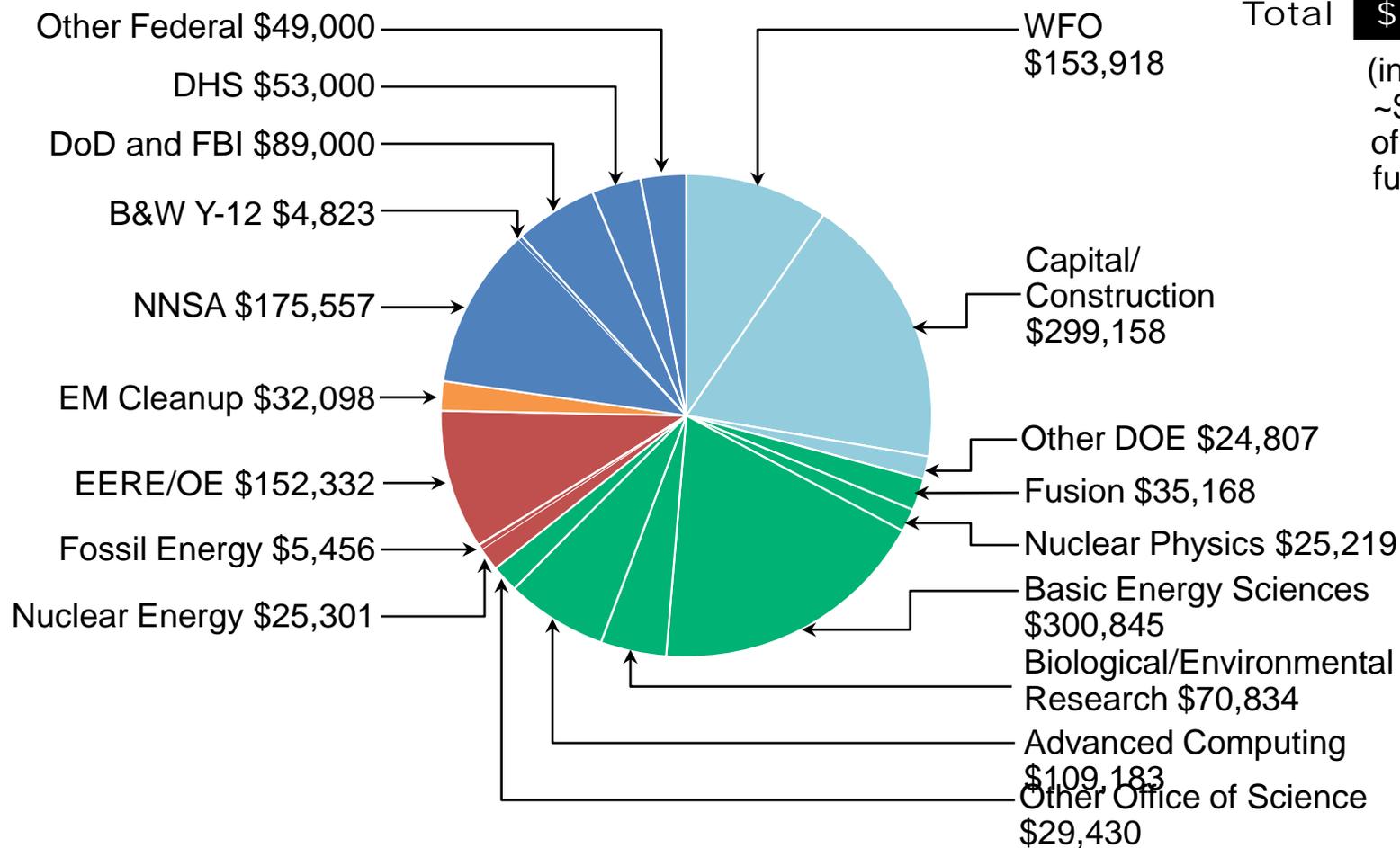


- \$1.4B budget
- 4,550 employees
- 4,000 research guests annually
- \$500 million invested in modernization

- World's most powerful open scientific computing facility
- Nation's largest concentration of open source materials research

- Nation's most diverse energy portfolio
- Operating the world's most intense pulsed neutron source
- Managing the billion-dollar U.S. ITER project

ORNL business volume (FY10 projected, \$k)



Science	\$571M
National Security	\$371M
Energy	\$201M
Cleanup	\$32M
Other	\$478M
Total	\$1.65B

(includes
~\$170M
of ARRA
funding)

ORNL is uniquely positioned to deliver science and technology for the 21st Century

We have an extraordinary set of assets

- Outstanding tools for materials R&D
- World-leading systems for open scientific computing
- BioEnergy Science Center
- Growing strength in climate change impact R&D
- The nation's broadest portfolio of energy programs
- Unique resources for nuclear technology
- Robust national security programs

Partnerships are key to the full utilization of these assets

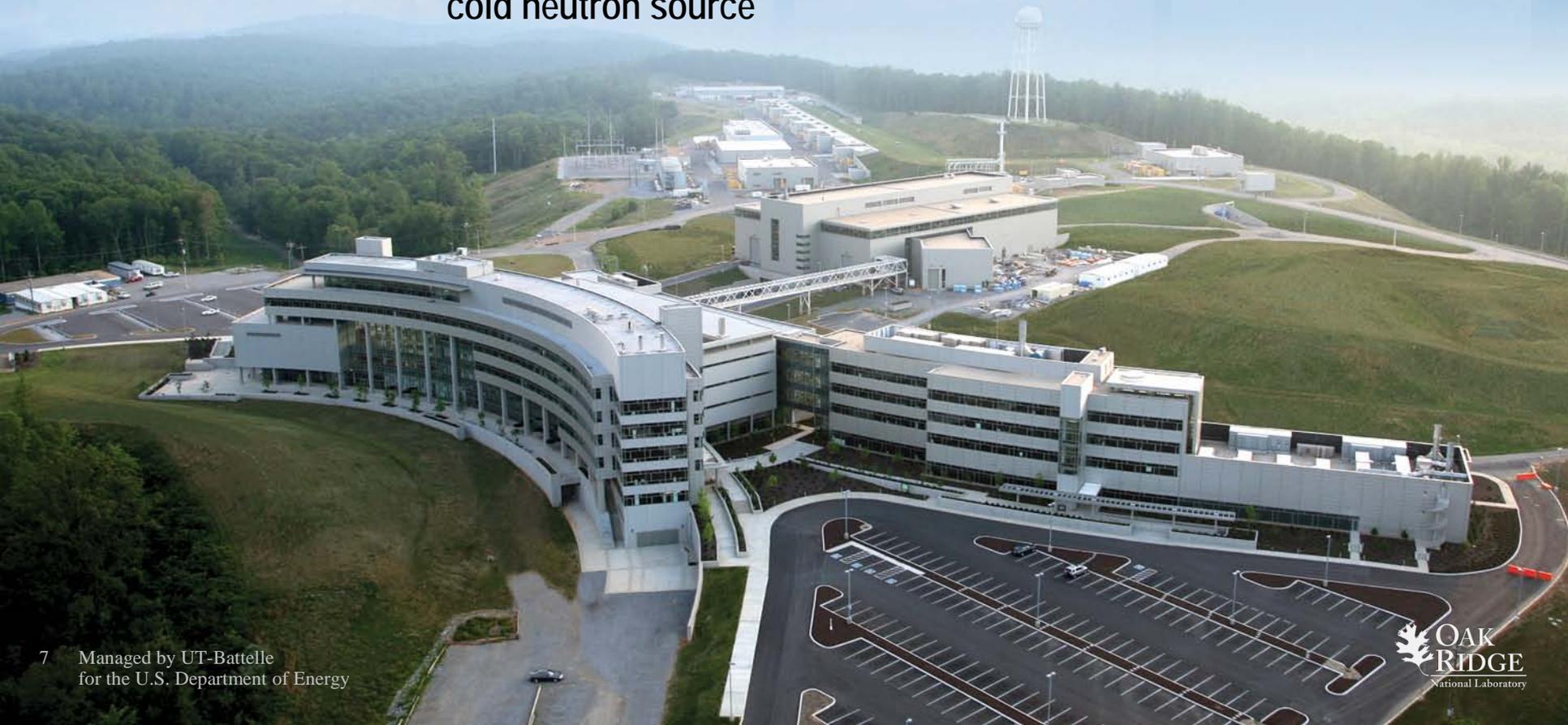
Studying materials with the world's best resources for neutron scattering

Spallation Neutron Source:
World's most powerful
accelerator -based
neutron source

**High Flux Isotope
Reactor:**
Complementary
capabilities
including a world class
cold neutron source

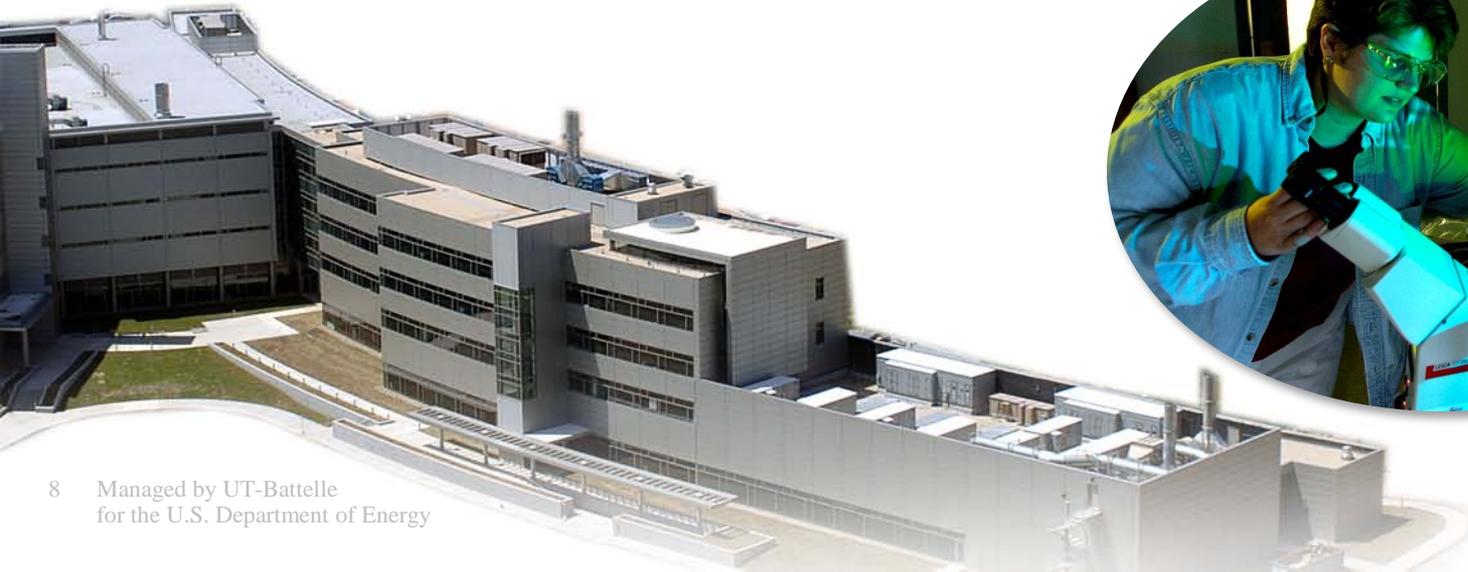
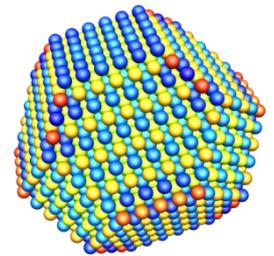
**UT-ORNL
Joint Institute for
Neutron Sciences:**
User gateway
for SNS and HFIR

**Ready
to welcome
thousands of
researchers each
year**



World-class capabilities in materials R&D

- DOE's first Nanoscale Science Research Center
 - Understanding materials and chemistry at the length scale where properties are determined
- World leading facilities (neutron scattering, electron microscopy, High Temperature Materials Laboratory)
- Synthesis and processing (alloys, ceramics, thin films, nanofabrication, laser and infrared processing)
- Hundreds of industrial partners, thousands of university users



We have major roles in new programs in physical sciences

Basic Energy Sciences

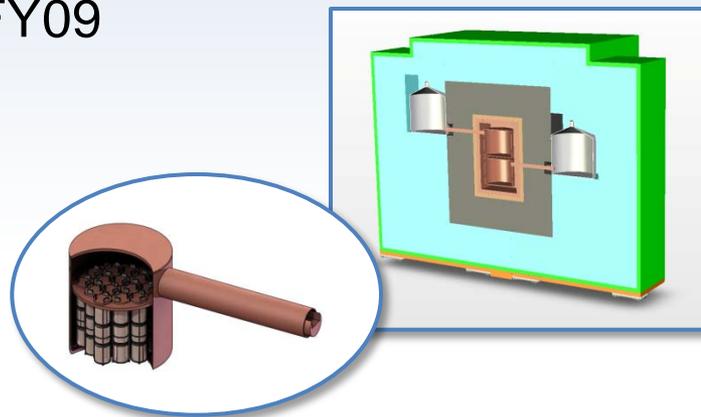
- Energy Frontier Research Centers:
\$16.6M in FY09
 - 2 at ORNL (each \$7.4M annually)
 - 7 at other institutions (\$1.8M in FY09)
- 3 Single Investigator/Small Group Research (SISGR) projects:
\$2.3M in FY09



DOE-BES
operating
funds have
increased
by 24%

Nuclear Physics

- Lead laboratory, Majorana Demonstrator project: \$300M (total project cost)
- Management responsibility for neutron electric dipole moment (nEDM) experiment construction: \$30M (total project cost)
- Californium program: \$9.3M in FY09



We are creating a climate change science knowledge center

Key resources

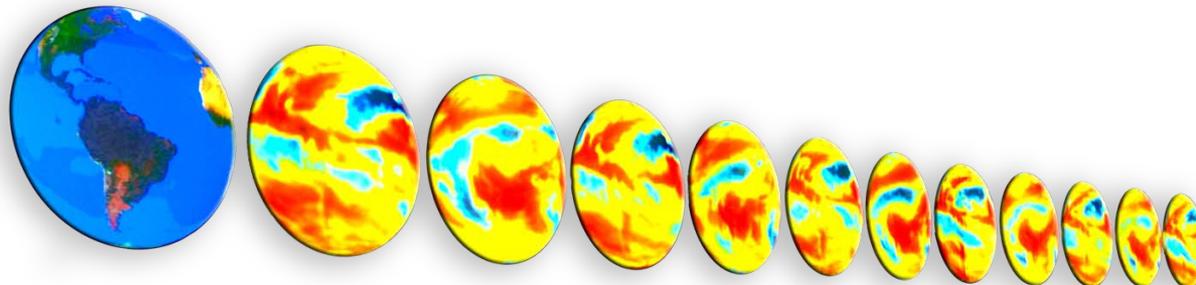
- Computational climate science and ESM integration
- Carbon cycle and ecosystem science
- Assessment of climate change impacts and adaptation
- High-performance computing:
DOE Leadership Computing Facility, NSF National Institute for Computational Sciences, NOAA Climate Modeling Center
- Data systems: ARM, CDIAC, NASA DAAC
- Longstanding partnerships:
NSF/NCAR, NASA, NOAA

Mission roles

- DOE: Earth system modeling, data systems for ARM, carbon cycle observations and climate model results, carbon cycle science
- NSF: Computational resources and global modeling, DataONE, NEON site
- NOAA: Computational resources and global modeling
- NASA: Data system for biogeochemical dynamics
- DoD, IC, DHS: Analysis of impacts and vulnerabilities for planning

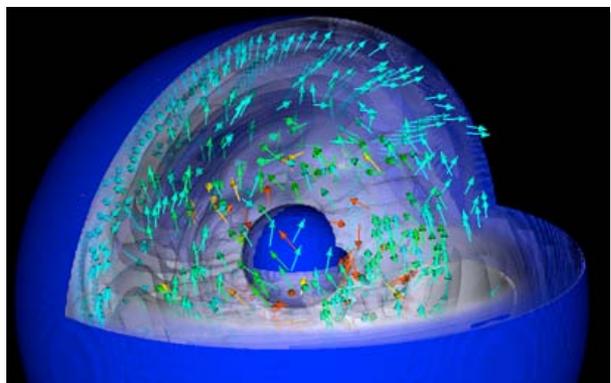
Priority activities

- Integrating computing and environmental R&D to build reliable prediction and assessment capabilities
- Deploying observational field platforms to improve and test ESMs
- Developing a knowledge system to integrate model and observational data and information
- Making strategic investments in analysis of uncertainties and climate extremes

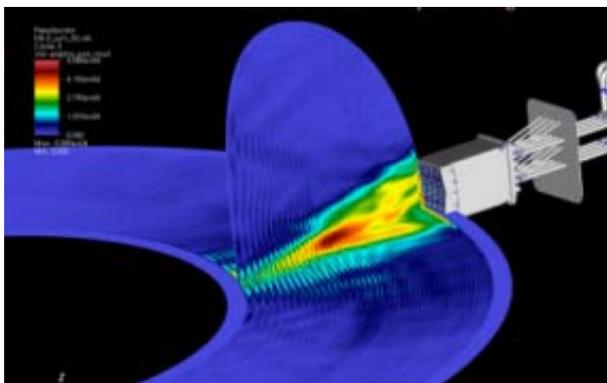


Leading the development of ultrascale scientific computing

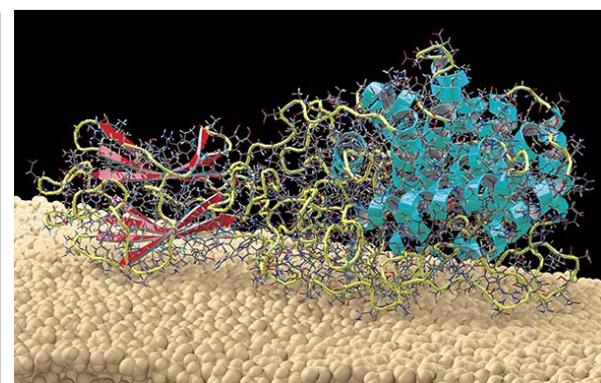
- World leading open scientific computing facility
- Recently upgraded to 1.64 petaflops
- Focus on computationally intensive projects of large scale and high scientific impact
- Partnered with UT in an NSF petascale computing center through the UT/ORNL Joint Institute for Computational Sciences



Astrophysics



Fusion



Biology

Joint Institute for Computational Sciences is managing more than \$90M in active NSF awards



National Institute for Computational Sciences: Kraken	\$67.8M
GLORIAD: Global Ring Network for Advanced Applications Development	\$6.5M
Algorithms and Numerical Analysis for Nested Approximations of Stochastic Particle Dynamics	\$0.3M
CDI-Type II: Hierarchical Stochastic Algorithms for Materials Engineering	\$0.4M
Computational Chemistry and Physics Beyond the Petascale	\$1.3M
NCS Remote Data Analysis and Visualization Center	\$10.0M
EPSCoR Desktop to TeraGrid EcoSystem	\$2.7M
Keeneland: Track 2D Experimental System (through Georgia Tech)	\$2.0M
Planning for XSEDE: eXtreme Science and Engineering Discovery Environment (through NCSA)	\$0.3M
Petascale Computing, Visualization and Science Discovery of Turbulent Sooting Flames	\$0.3M
Total	\$91.6M

Biological and environmental sciences: Successful competition for Science Focus Areas

- DOE-SC's Office of Biological and Environmental Research has established Science Focus Areas to:
 - Encourage integrative, collaborative research programs
 - Take advantage of unique national laboratory strengths
 - Drive interdisciplinary, team-oriented, mission-relevant research
- We successfully recompeted our projects via peer-reviewed proposals to consolidate our efforts into Science Focus Areas

	FY09	FY09–FY11
Climate	\$6.56M	\$19.68M
Genomics:GTL	\$3.49M	\$10.80M
Subsurface Science	\$3.00M	\$9.00M
Total	\$13.05M	\$39.48M



Transforming the new biology into bioenergy

- Developing bio-based solutions for energy, the environment, and carbon sequestration
- Managing the \$135M DOE BioEnergy Science Center to advance cellulosic ethanol research
- Partnered with the \$73M Tennessee Biofuels Initiative
 - Brings UT, ORNL, and industry together
 - Includes bioenergy research, a 250,000 gal/year pilot plant, and agricultural incentives for switchgrass



Exploring how ecosystems respond to global and regional change

Plant sciences



Carbon cycle and ecosystem research



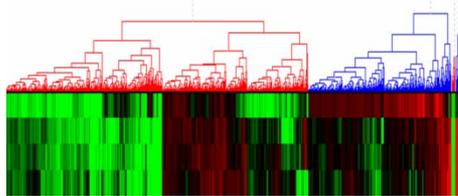
Subsurface science



Ecological management



Microbial ecology and functional genomics

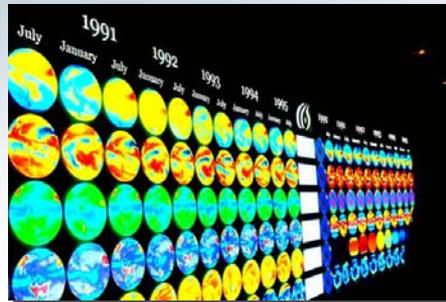


Detect, model, and simulate environmental responses

Society-technology interfaces



Global climate simulation



Environmental data systems



ORNL has a large and growing energy efficiency, renewable energy, and electricity delivery portfolio

- Over \$100M in FY 2008: Largest national lab effort in transportation and industrial technologies and in superconductivity
- Significant growth in fuel cells, biomass, and grid visualization/modeling
- Major national facilities including High Temperature Materials Laboratory, National Transportation Research Center, and Building Technologies Research and Integration Center



Lightweight carbon fiber materials from lignin



“Zero-energy” homes



Triaxial superconducting cable installed at AEP Bixby

Energy and Engineering Sciences: >\$20M for new projects in FY09

- Office of Energy Efficiency and Renewable Energy
 - Geothermal: \$2M
(new research area for ORNL)
 - Wind energy: \$5M
 - Industrial technology:
\$10M in new funding
(includes \$8M for new equipment)

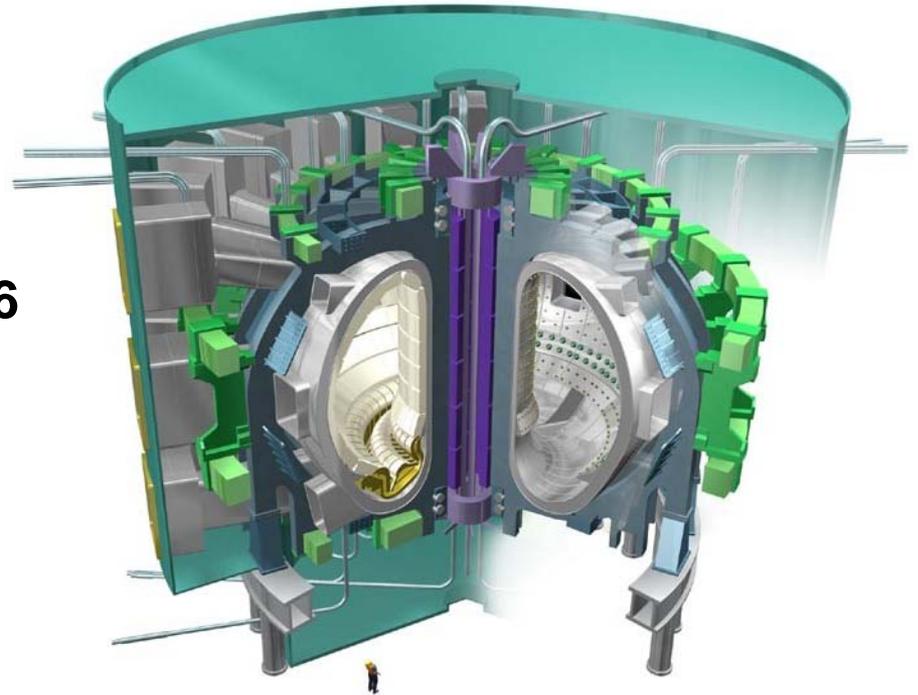
- Office of Electricity
 - \$5M in new funding,
primarily for smart grid

FY10: Expecting a
~50% increase in
EERE funds



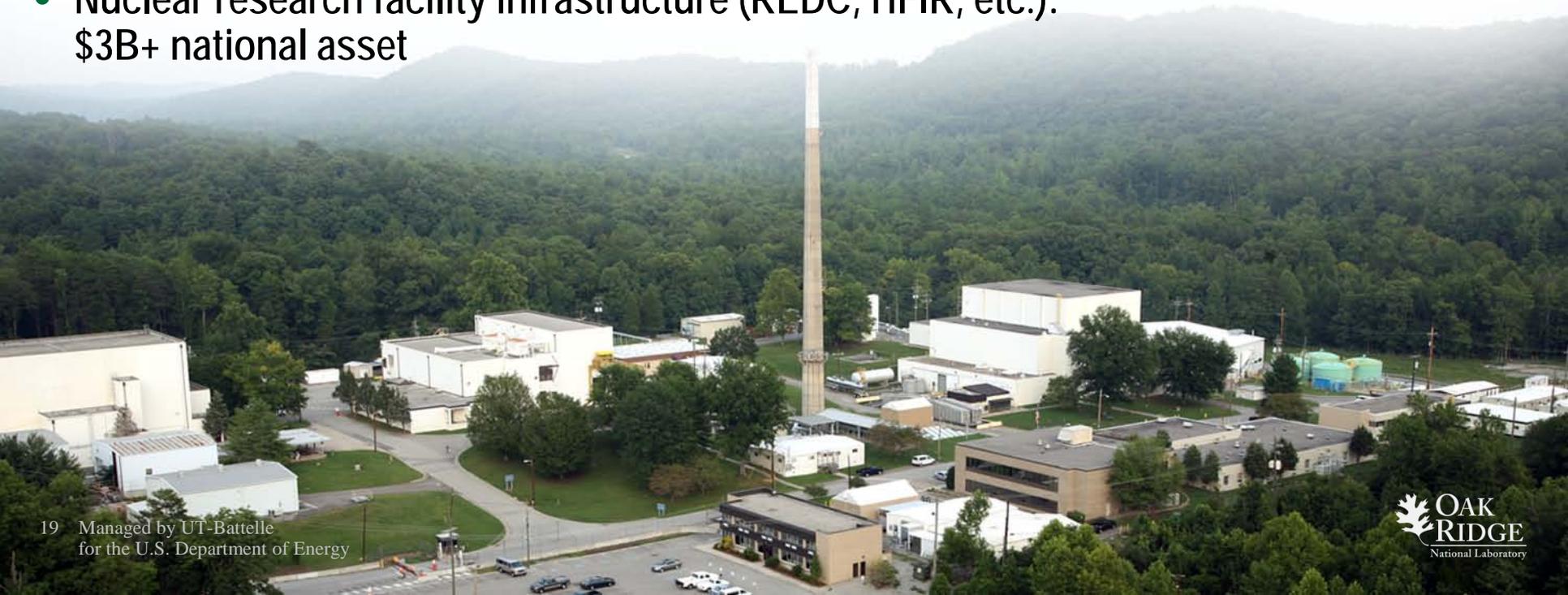
ITER is the next step toward fusion power

- **Joint international R&D project aimed at demonstrating the scientific and technical feasibility of fusion power**
- **To be built in Cadarache, France, with operation set to begin in 2016**
- **Total cost: About \$12 billion**
 - **ORNL is managing the billion-dollar U.S. ITER Project**



ORNL is uniquely positioned to support advanced nuclear fuel cycle research

- Coupled End-to-End (CETE) demonstration delivers advanced nuclear fuel cycle S&T
- Fuel examination and reprocessing
- Materials irradiation at HFIR
- Reactor design and engineering
- Nuclear research facility infrastructure (REDC, HFIR, etc.):
\$3B+ national asset



National security S&T has become a major activity at ORNL

- We are among DOE's leading labs for nuclear nonproliferation
- We have a growing role with the Department of Homeland Security
- We supply technology and expertise to the Department of Defense



National security S&T
builds upon and
complements
our DOE missions



Our national and homeland security portfolio continues to expand

Nuclear weapons transportation program	Defense Threat Reduction Agency	\$38.4M
Light Armored Vehicle	U.S. Marine Corps	\$5.2M
Micro Gas Analyzer, Phase IV	DARPA	\$3.8M
Collaborative R&D	Lockheed Martin Corporation	\$3M
Photoacoustic detection and identification of explosives residue	Joint IED Defeat Organization (DoD)	\$0.9M
Third-Generation Residential Smoke Alarm Concept Study	FEMA	\$0.4M

Total new BA, FY09 >\$50.0M



FEMA



ORNL is a partner on 13 ARPA-E proposals

Energy and Engineering Sciences

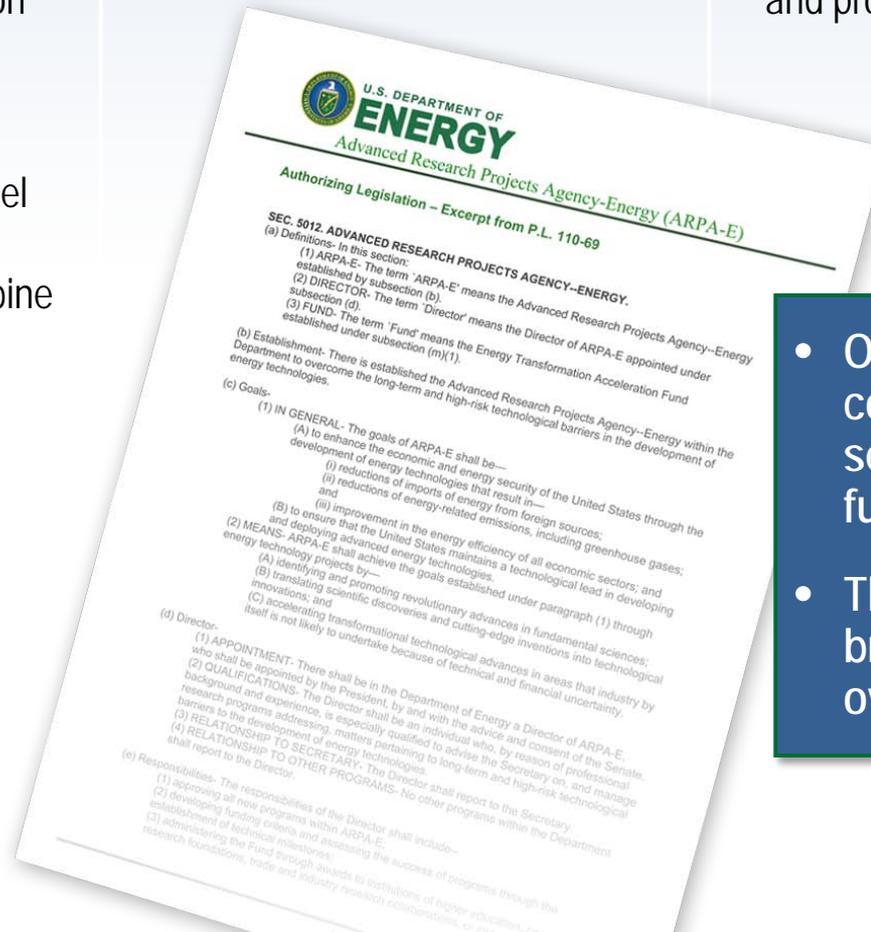
- High-efficiency consumer electronics
- Advanced power semiconductor and packaging
- Novel, low-cost deoxygenation of algal and vegetable oils and animal fats
- Energy-efficient microwave conversion of coal to liquid fuel
- Integration of a CSP plant with a CO₂ Brayton cycle turbine
- Ionic liquid based reactive absorption process for olefin recovery
- Novel low-temperature thermochemical generation of hydrogen and oxygen from water
- Aligned graphene for ultracapacitors

Biological and Environmental Sciences

- Cellulolytic yeast producing hydrocarbon fuels
- Microbial conversion of biomass-derived syngas

Physical Sciences

- Catalysts for Li-air batteries
- Electron beam composites
- Transformational processes for ammonia synthesis and production



- Only 2% of 3,500 concept papers were selected to submit full applications
- These projects could bring >\$10M to ORNL over the next 5 years

We are tracking ~60 Recovery Act projects, with more pending

R&D, primarily in the areas of science and energy

NOAA: Climate Modeling Center	\$215.0M
State of Tennessee: Tennessee Solar Initiative	\$31.5M
Advanced Materials R&D to Advance Clean Energy Technologies	\$23.0M
Systems Biology Knowledgebase	\$3.2M
Industrial Technologies Program: Energy-Intensive Process R&D	\$3.1M
Transfer Reactions on Unstable Nuclei	\$1.9M

New equipment for science

Jaguar XT5 upgrade	\$19.9M
Fundamental Neutron Physics Beamline	\$9.2M
Isotope capability upgrades	\$6.4M
Center for Nanoscale Materials Science equipment	\$5.8M
BioEnergy Science Center equipment	\$5.4M
NSF: IMAGINE neutron diffractometer at HFIR	\$1.8M



Tennessee solar project gains federal approval

• THE TENNESSEAN •



We are tracking ~60 Recovery Act projects, with more pending (continued)

- Technical assistance

- EERE: Energy Efficiency and Conservation Block Grant/State Energy Program, \$32.5M
- DoD: Dover Air Force Base energy efficiency improvements, \$25M

- Campus modernization

- Modernization of Laboratory Facilities, \$61M
- Melton Valley Maintenance Support Facility, \$10M

- Cleanup

- 2000 complex demolition, \$16M
- Building 3026 demolition, \$14M

- We have received \$340M in Recovery Act funding to date
- Over 2 years, this represents a ~10% increment in our budget

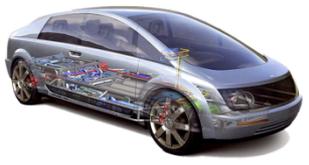




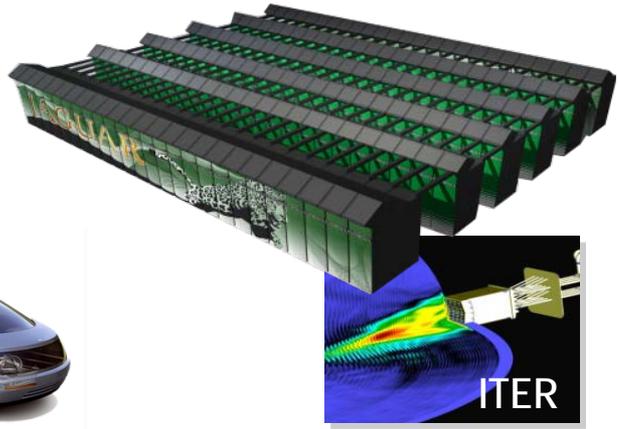
The science of opportunities:

We lead major R&D programs for DOE and other customers

Energy technologies



Ultrascale computing

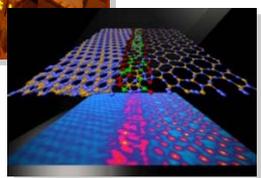


Bioenergy

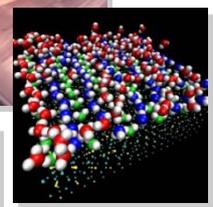


Climate

Materials at the nanoscale



Neutron sciences



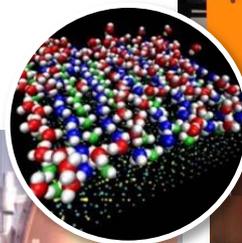
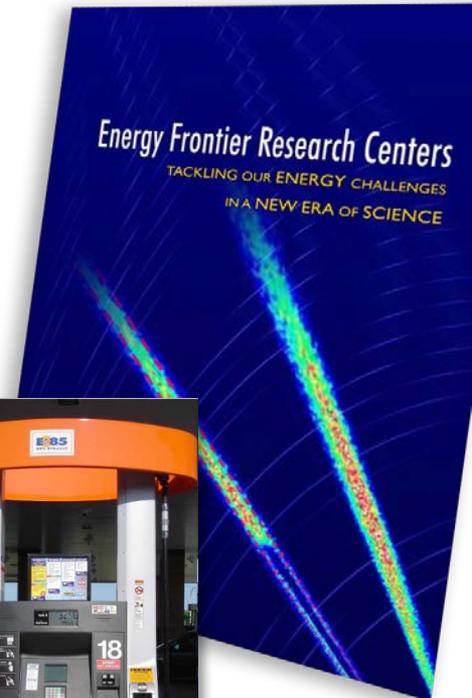
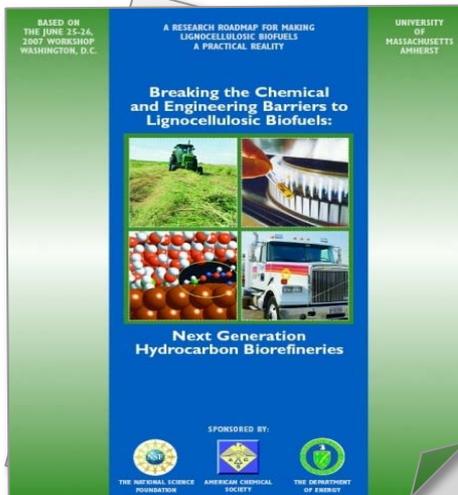
Nuclear energy

National security



ORNL offers:

- Collaboration
- Joint research proposals
- User facilities
- Shared students and Postdocs
- Joint faculty and research appointments
- Visiting scientists and engineers
- Cooperative research agreements
- Work for others
- Student internship research experiences



ORNL Scientific User Facilities

- Building Technologies Research and Integration Center
- Center for Nanophase Materials Sciences
- Center for Structural Molecular Biology
- High Flux Isotope Reactor
- High Temperature Materials Laboratory
- Holifield Radioactive Ion Beam Facility
- National Center for Computational Sciences
- National Transportation Research Center
- Oak Ridge Electron Linear Accelerator
- Safeguards Laboratory
- Shared Research Equipment Facility
- Spallation Neutron Source



Want to know more?

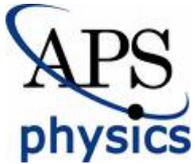
<http://jobs.ornl.gov>

The screenshot shows the Oak Ridge National Laboratory website in a Windows Internet Explorer browser. The address bar displays <http://jobs.ornl.gov/>. The website header includes the ORNL logo, the text "Managed by UT-Battelle for the Department of Energy", and a search bar. A navigation menu on the left lists various site sections, with a blue arrow pointing to the "Jobs" link. The main content area features a "Real Science. Real Life." banner with a photo of a control room. Below this is a navigation bar for research areas: Advanced Materials, Biological Systems, National Security, Energy, Neutron Science, and Computing & Computational Sciences. A featured article highlights Sarah Cousineau, a Specialist in Accelerator physics, with a photo and a brief description of her work. To the right of the featured article are three buttons: "View Open Positions", "Get Registered", and "View/Apply to Positions". Below these buttons is contact information for ORNL Recruiting. A "The Basics" section lists various guides and fact sheets. At the bottom, there are sections for "University Fellowship Jobs", "Internships, Postdoc, Postgrad Research Opportunities", and "Upcoming Recruiting Events". The footer contains logos for UT-Battelle, the U.S. Department of Energy Office of Science, and the Oak Ridge National Laboratory.

Reaching Students and YOU



Rx3



On Campus



ORNL Interns Summer 2009

Basic Info
 Name: ORNL Interns Summer 2009
 Category: Student Groups - General
 Description: Group for organizing trips, events, and parties for the Oak Ridge National Laboratory interns, their friends, and anyone else in the Knoxville/Oak Ridge area who wishes to participate.

Contact Info
 Email: [redacted]
 Office: [redacted]
 Location: [redacted]

Recent News
 Don't miss the Little River Tubing trip this Saturday! Find the event listed under group events and RSVP if you can. However, you can still go even if you aren't RSVP.
 Please give your comments on what trips you would like to do!
 Last summer we had: hiking, camping, boating, tubing, rafting, canoeing, mountain biking, climbing, road trips, salsa lessons/dancing, swimming, and lots of general parties. Let's do even more this summer!

Members
 Displaying 8 of 139 members

Discussion Board
 Displaying 3 of 8 discussion topics

AWR Summer Picnic - Free Food Again
 1 post by 1 person. Updated on July 1, 2009 at 5:26am

4x4 Adventure?
 3 posts by 3 people. Updated on July 1, 2009 at 5:26am

Happy Putter Anyone?
 1 post by 1 person. Updated on June 20, 2009 at 7:32am

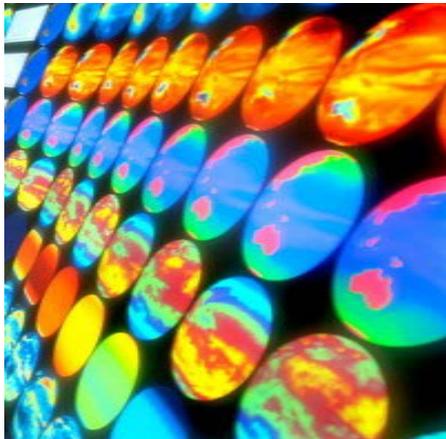
The Wall
 Displaying 5 of 44 wall posts.

Abined Raslan wrote
 at 5:27am on July 1th, 2009

Student Opportunities Through Partnerships:

ORAU and ORISE

- **Undergraduate Internships**
- **Graduate Students**
- **Postdoctoral Appointments**
- **Faculty Experiences**



<http://see.orau.org/>

At a Glance: Student, Postdoctoral, and Fellow Programs

Undergraduate	Graduate	Postdoctoral	Faculty	Fellows*
<ul style="list-style-type: none"> • Co-op program • DHS HS-STEM Internship • HERE@ORNL • Laboratory Technology Program • Nuclear Engineering Science Laboratory Synthesis Internship • Research Alliance in Math and Science • Science Undergraduate Laboratory Internship 	<ul style="list-style-type: none"> • Advanced Short-Term Research Opportunity • HERE@ORNL • Nuclear Engineering Science Laboratory Synthesis Internship • Research Alliance in Math and Science • Post-Master's Research Participation 	<ul style="list-style-type: none"> • Advanced Short-Term Research Opportunity • Instrument Development Fellows • Postdoctoral research associates 	<ul style="list-style-type: none"> • DHS Summer Research Team • Faculty and Student Team • HERE@ORNL • NRC Faculty Research Participation • Sabbaticals and summer research 	<ul style="list-style-type: none"> • Eugene Wigner Fellows • Alvin M. Weinberg Fellows • Clifford Shull Fellows: Neutron science • Alston Householder Fellows: Scientific computing

* ORNL employment program

<http://jobs.ornl.gov>

ORNL Distinguished Fellowships



Wigner Fellowship

- Established in 1975
- 2 yr designation
- Must be within 3 yrs of Ph.D. completion
- Legacy of more than 70 outstanding scientists
- Must be on the leading edge of new innovative science



Weinberg Fellowship

- Established 2008
- 2 yr designation
- Within 3 yrs of Ph.D. completion
- Seven fellows already appointed
- Focuses on scientific leadership potential

For more info on fellowships, visit:

<http://jobs.ornl.gov/fellowships/Fellowships.html>

Topical Fellowships



Householder Fellowship

- PhD in Computer science, mathematics, statistics
- Must be within 3 yrs of Ph.D. completion
- 1 yr appointment with renewal for a second



Clifford G. Shull

- Neutron Sciences specific
- Cannot currently hold a postdoctoral research position
- Two yr appointment renewable for a third

For more info on fellowships, visit:

<http://jobs.ornl.gov/fellowships/Fellowships.html>

Contact Information



CHANGING
the **WORLD** ONE
CAREER at a TIME

Shelly Hunt Lohmann

University Recruiting and Fellowship Programs

Oak Ridge National Laboratory

865-574-7522 office

865-806-2096 mobile

Email and IM: lohmannsh@ornl.gov

<http://jobs.ornl.gov>

Joshua M. Scull

University Recruiter

Oak Ridge National Laboratory

865-241-9030 office

865-466-6416 mobile

Email and IM: sculljm@ornl.gov

<http://jobs.ornl.gov>

Follow ORNL on:



Questions and Discussion

