

UT-Battelle at Oak Ridge National Laboratory: The First Five Years

Annual Report to the Community

Sponsored by
Friends of Oak Ridge National Laboratory

Jeffrey Wadsworth
Director, Oak Ridge National Laboratory

Oak Ridge, Tennessee
April 21, 2005

I believe Alvin Weinberg accurately described what makes a great national lab back in 1967



“A powerful instrument of technical, scientific, and social progress”

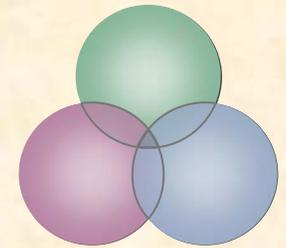
“A unique combination of mission orientation and discipline orientation”

“A flair for getting after very big and difficult matters”

UT-Battelle assumed responsibility
for managing and operating ORNL
on April 1, 2000



UT-Battelle in 2000: We made a commitment to simultaneous excellence



Science and Technology

- **Neutron scattering**
- **High-performance computing**
- **Life sciences**
- **Materials sciences**
- **Sustainable energy technologies**
- **National and homeland security**
- **University partnerships**

Operations and ES&H

- **Modernization**
- **Improved ES&H performance**

Community Service

- **Increased availability of ORNL technologies**
- **Valued member of the community**

We committed to make ORNL the world's center for neutron scattering

SNS



HFIR



JINS



Challenges

- **Uncertain funding**
- **Six-lab partnership never before completed**
- **Need for world-class scientific and operating team**

- **Operating infrastructure less than adequate**
- **Culture not consistent with operational expectations**
- **Insufficient funding**

- **Tight fiscal times for the State of Tennessee**
- **Change in administration**

We committed to make ORNL the world's center for neutron scattering

Today



- **SNS on scope, on budget, and on time for operation beginning in June 2006**



- **HFIR technical upgrades near completion**
- **Best-in-class instruments**
- **Strengthened management and operational culture**



- **JINS design complete**
- **Construction starts later this year**

We committed to make ORNL a top U.S. high-performance computing laboratory

Multi-teraflops capability



Networking



JICS



Challenges

- High-speed computing not a DOE priority
- Recruitment needs in computational sciences, mathematics, key applications
- Limited connectivity
- Tight fiscal times for the State of Tennessee
- Change in administration

We committed to make ORNL a top U.S. high-performance computing laboratory

Today



- Partnership with ANL and PNNL to develop the National Leadership Computing Facility
- Leadership in key DOE application areas

- Providing international access to our computational resources through high-speed networking

- Expanding our partnership in computational science with UT and other leading research universities

We committed to recapture ORNL excellence in life sciences

Mouse House



Research program



JIBS



Challenges

- **Inadequate facilities that interfered with recruiting**
- **Labor costs exceedingly high**
- **Mouse genetics not a BER priority**
- **Lack of clear focus areas**
- **Limited NIH presence**
- **Tight fiscal times for the State of Tennessee**
- **Change in administration**

We committed to recapture ORNL excellence in life sciences

Today



- **State-of-the-art mouse vivarium**
- **Environmental and Life Sciences Laboratory**
- **Renovated greenhouse**



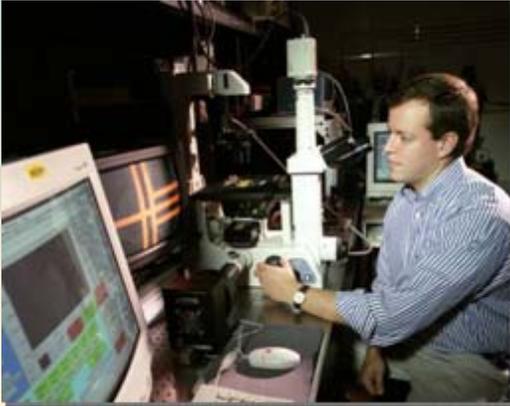
- **Pipeline for protein characterization with PNNL**
- **Leadership in microbial genomics**
- **Expanding customer base**



- **JIBS design complete**
- **Construction starts this year**

We committed to sustaining ORNL's leadership in material science

Microscopy



Advanced materials



CNMS



Challenges

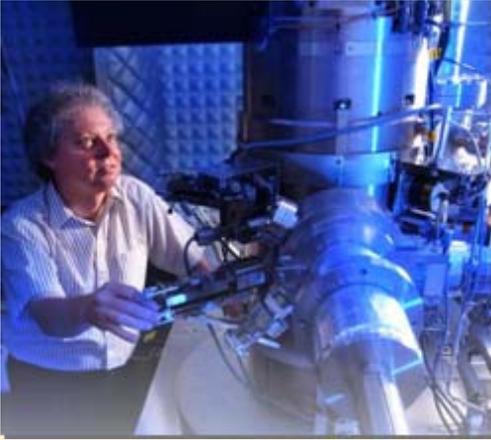
- **No ORNL facilities adequate to house next-generation instruments**

- **Need to develop leadership position in nanoscale R&D**
- **Need for additional world-class scientific leadership**

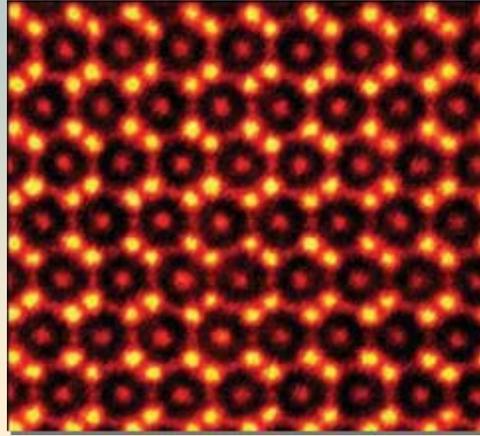
- **Intense competition for DOE nanoscience research facilities**

We committed to sustaining ORNL's leadership in material science

Today



- **World's highest resolution STEM housed in Advanced Microscopy Laboratory**

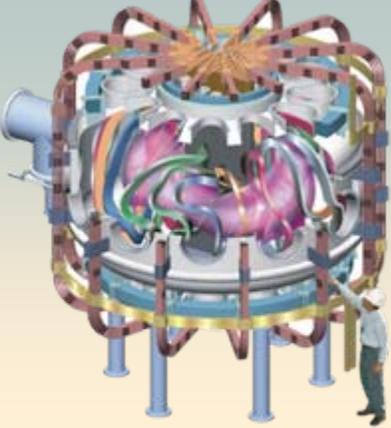


- **Recognized forefront position in controlling functionality at the nanoscale**
- **First-rate research leadership in all primary focus areas**



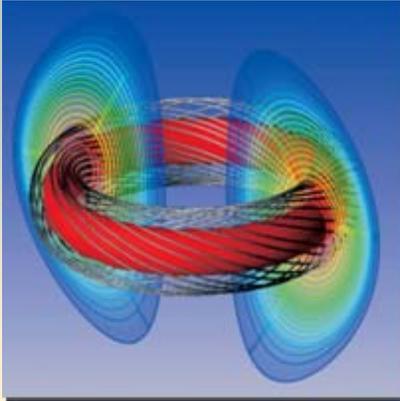
- **DOE's first nanoscience center will be complete in April 2006**

We committed to provide DOE leadership in sustainable energy technology

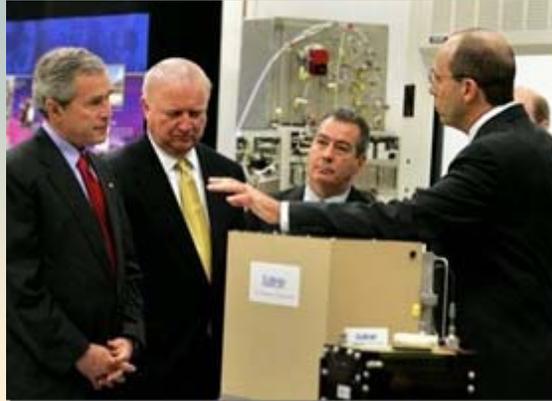
Fusion energy	High-efficiency buildings	Power distribution
		
Challenges		
<ul style="list-style-type: none">● Aging facilities at Y-12● No fusion experiment in Oak Ridge	<ul style="list-style-type: none">● Building regional partnerships● Fragmented program	<ul style="list-style-type: none">● Building regional partnerships● Fragmented program

We committed to provide DOE leadership in sustainable energy technology

Today



- **Co-leading the U.S. ITER project office with PPPL**
- **At the forefront in fusion simulation**
- **CD-1 for Quasi-Poloidal Stellarator**



- **Our energy technologies are attracting attention at the highest levels**



- **Our partnership with TVA and industry is creating new transmission technology**



We committed to become a key resource for national security

Nuclear Security



Department of Defense



Public safety



Challenges

- Lack of classified work space
- New National Nuclear Security Administration

- Lack of classified work space
- Need to position ORNL as a provider of choice

- Building connections with law enforcement

We committed to become a key resource for national security

Nuclear Security



Department of Defense



Homeland Security



Today

- **Leading key NNSA initiatives**
- **\$150M program**
- **Broad connections to the defense and intelligence communities**
- **\$100M program**
- **State and regional partnerships**
 - **SensorNet**
 - **Safe Cities**

We committed to greatly expand partnerships with academic institutions

ORAU	Core Universities	ORCAS
		
Challenges		
<ul style="list-style-type: none">● Extension of existing relationships	<ul style="list-style-type: none">● Building strong and effective partnerships● Creating joint appointments with new partners	<ul style="list-style-type: none">● Tight fiscal times for the State of Tennessee● Change in administration● Establishing world-class think tanks is hard to do

We committed to greatly expand partnerships with academic institutions

Today



- Expanded relationships with national university community
- HBCU faculty summer research program



- Joint hires with core universities
- Joint research proposals
- Recent addition of Vanderbilt



- Paul Gilman hired as ORCAS director
- ORCAS scientific advisory board to be announced soon



We committed to modernize ORNL's research campus

Private investments



Increased DOE investments



State investments



Challenges

- Transferring property to private sector
- Attracting private capital despite lease terms
- Historic tendency to neglect infrastructure
- Restrictions on use of overhead funds
- Tight fiscal times for the State of Tennessee
- Change in administration

We committed to modernize ORNL's research campus

Today

DOE Programmatic Investments		DOE Infrastructure Investments		Private Sector Investments		State of Tennessee Investments			
✓	Laboratory for Comparative and Functional Genomics (\$14M)	✓	Advanced Microscopy Laboratory (\$5M)	✓	Computational Sciences Building	↑ \$72M total ↓	✓	Joint Institute for Computational Sciences	↑ \$14M total ↓
✓	SANS Guide Hall at HFIR (\$4M)	✓	Research Support Center (\$16M)	✓	Engineering Technology Facility		✓	Oak Ridge Center for Advanced Studies	
➡	Center for Nanophase Matls Sciences (\$65M)	✓	High-bay area for fusion experiments (\$5M)	✓	Research Office Building		⌚	Joint Institute for Biological Sciences (\$8M)	
➡	Spallation Neutron Source (\$1,400M)			➡	Multiprogram Research Facility (\$40M)		⌚	Joint Institute for Neutron Sciences (\$8M)	

✓	Construction completed	➡	Under construction	⌚	Construction start expected soon
---	------------------------	---	--------------------	---	----------------------------------

We have realized our vision
for the East Campus



We are on our way to revitalizing
the West Campus



We committed to improve ES&H performance

Increased accountability



Better systems



Stronger subject-matter experts



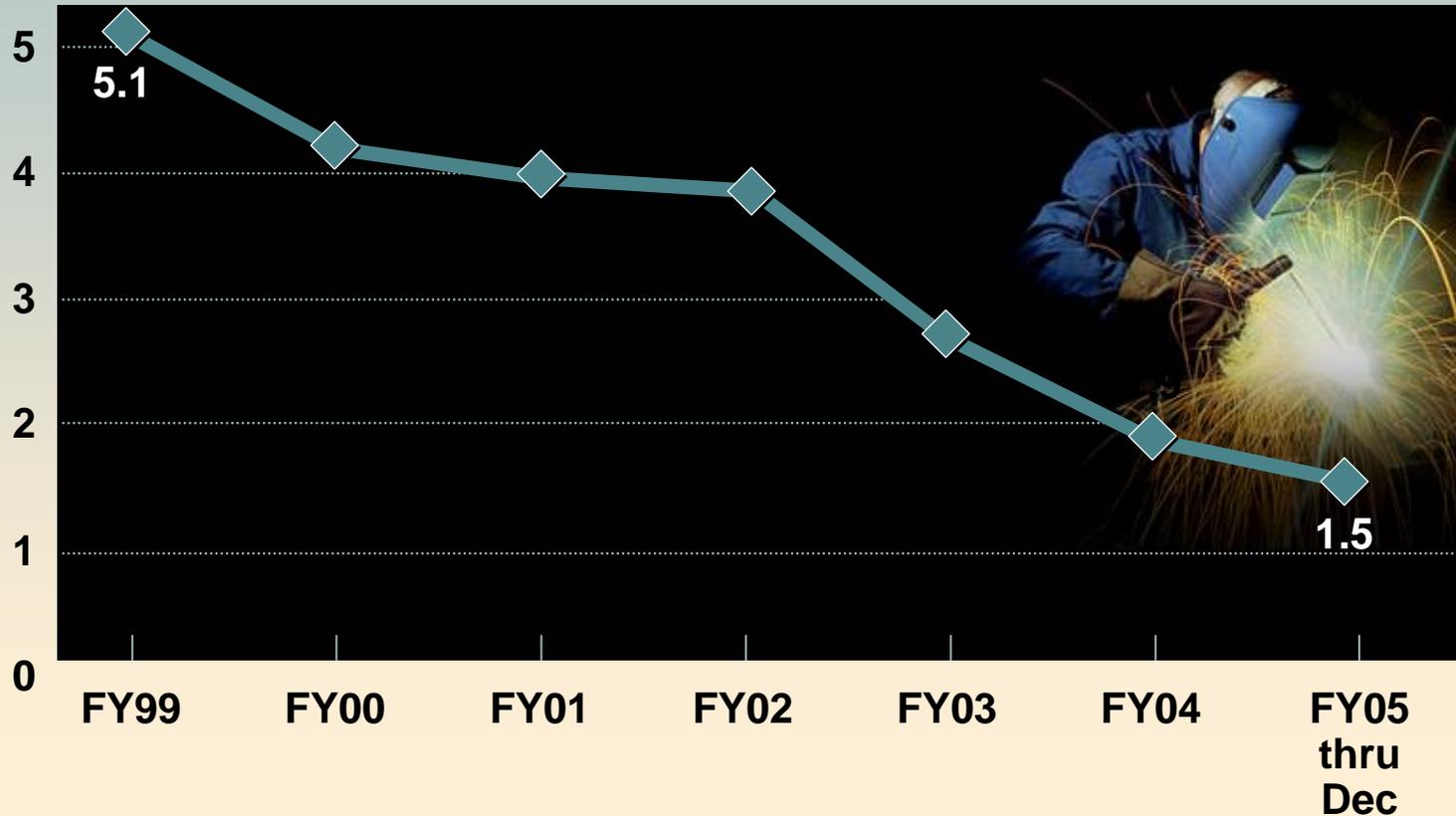
Challenges

- **Accountability for safety performance not part of culture**
- **Lab had 35 independent safety management systems**
- **Safety organization focused on oversight, not on support**

We committed to improve ES&H performance

Today

Total Recordable Case Rate



We committed to improve ES&H performance

Today

We have disposed of:

- 33,377 cubic feet of low-level waste
- 10,660 excess chemical items
- 9,500 mouse skeletons
- 3,500 pumps and motors
- 1,292 gas cylinders
- 750 tons of scrap metal
- 121 cubic feet of reactive metals
- 181 moving vans of property sold at auction



We committed to increase the availability of ORNL technology

Enhanced access



Stronger assistance



Additional resources



Challenges

- **Laboratory culture**
- **Fragmented economic development efforts**
- **Limited business relationships**
- **Unstable funding for Tech2020**
- **Lack of debt and venture capital**

We committed to increase the availability of ORNL technology

Today



- Top-notch economic development staff
- Leadership in regional economic development efforts



- Center for Entrepreneurial Growth
- 56 new companies
- 200 new jobs with a \$15M payroll and \$10M investment



- Battelle Ventures
- Accelerator Fund
- Privately funded technology transfer


BATTELLE | VENTURES

We committed to being a valued member of the community

Strengthen education



Expand volunteerism



Provide leadership



Challenges

- **Need for focus**

- **Lack of structure**

- **Balance of investments**

We committed to being a valued member of the community

Today



- Oak Ridge High School revitalization
- \$2.5M for science education
- 27 new science labs
- UT workshops for science teachers

- 61 volunteer projects
- 2,700 employees participating
- 14,500 volunteer hours

- \$6M in legacy investments
- \$1M in annual property taxes
- Leadership in civic organizations

UT-Battelle in 2005: We have delivered everything that we promised

Science and Technology

- ✓ Neutron scattering
- ✓ High-performance computing
- ✓ Life sciences
- ✓ Materials sciences
- ✓ Sustainable energy technologies
- ✓ National and homeland security
- ✓ University partnerships

Operations and ES&H

- ✓ Modernization
- ✓ Improved ES&H performance

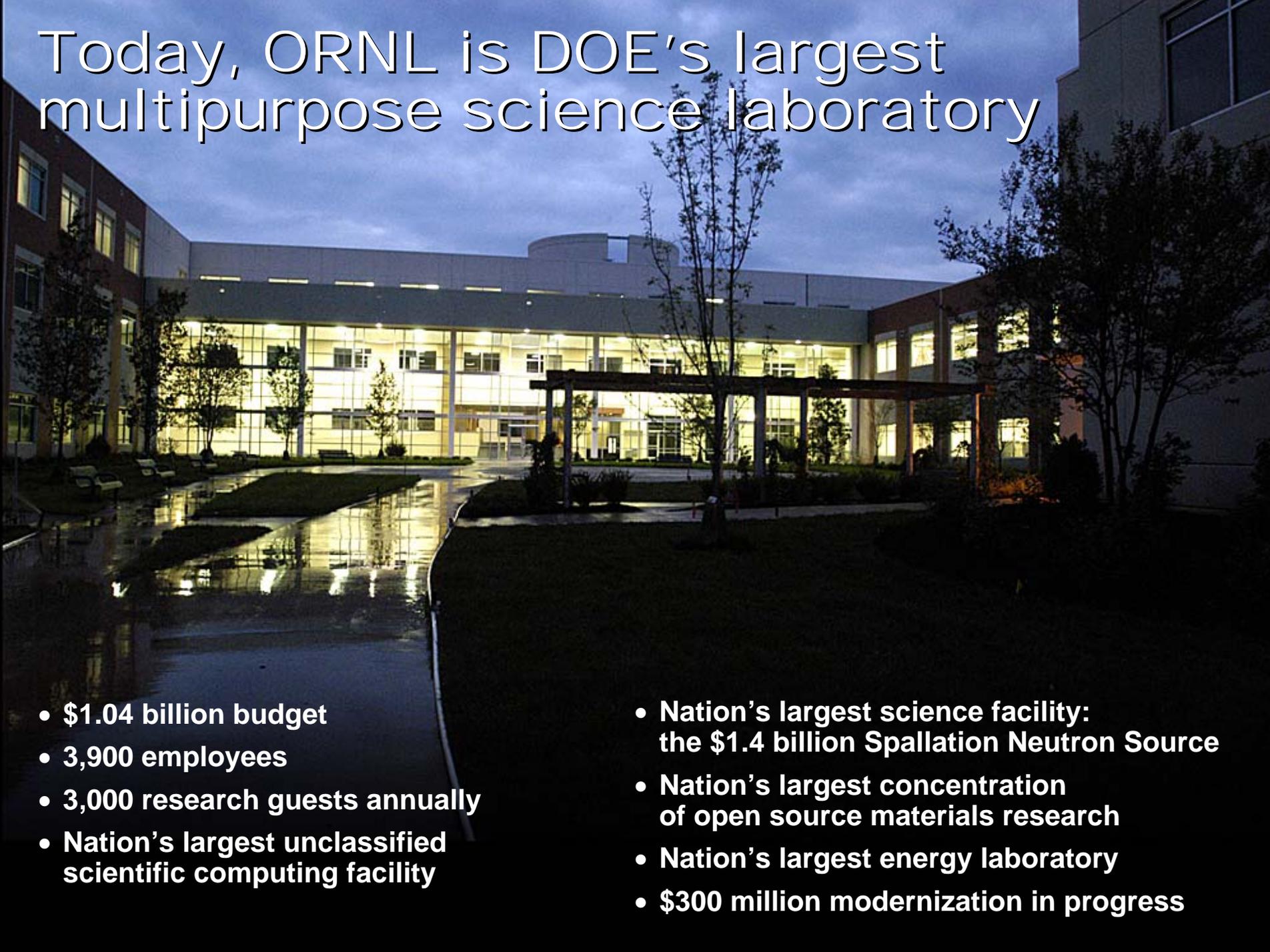
Community Service

- ✓ Increased availability of ORNL technologies
- ✓ Valued member of the community

**DOE decision to extend contract
announced on December 13, 2004**



Today, ORNL is DOE's largest multipurpose science laboratory



- **\$1.04 billion budget**
- **3,900 employees**
- **3,000 research guests annually**
- **Nation's largest unclassified scientific computing facility**
- **Nation's largest science facility: the \$1.4 billion Spallation Neutron Source**
- **Nation's largest concentration of open source materials research**
- **Nation's largest energy laboratory**
- **\$300 million modernization in progress**

UT-Battelle in 2010: What are our bold commitments for the next five years?

Science and Technology

- **World's foremost center for neutron science**
- **World's leading center for capability computing**
- **Leadership in nanoscale science and technology applied to materials, biology, and energy challenges**
- **Leadership in systems biology and ecology focused on microbial, ecosystem, and mouse genomics**
- **Leadership in materials, nuclear, and plasma science and engineering underpinning advances in energy technologies**
- **Strategic integration of our science and technology assets to provide innovative solutions to energy and national security challenges**



UT-Battelle in 2010: What are our bold commitments for the next five years?

Operations and ES&H

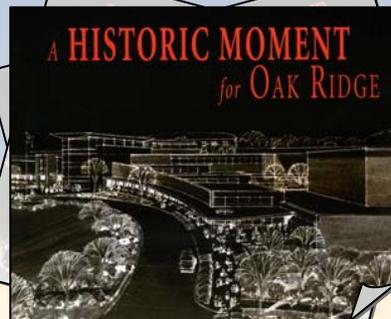
- **Complete the revitalization of ORNL**
 - Clean up Central Campus
 - Remove all legacy materials and facilities
 - Modernize Building 4500
 - Rationalize our nuclear facility infrastructure
- **Deliver best-in-class safety and operational performance**
- **Establish a solid financial model that provides us with margin**



UT-Battelle in 2010: What are our bold commitments for the next five years?

Community Service

- **Leadership in transferring technology to the marketplace**
- **Recruiting the best and the brightest from the nation's top universities**
- **Joint institutes in areas of strategic interest operating with external funding**
- **Oak Ridge Center for Advanced Studies providing comprehensive information for policy making**
- **A continuing record of community engagement**



Excellence in science and innovative solutions to complex problems

A leader in efficient operation and the protection of workers, the public, and the environment

A trusted and valued community/regional asset

Our opportunities are accompanied by big challenges



**Removing
environmental legacies**



**Recruiting
world-class talent**



**Managing
budget constraints**

A photograph of a sunset over a body of water. The sun is a bright, glowing orb in the upper right corner, casting a long, shimmering reflection across the water's surface. The sky is a deep orange, and the silhouettes of trees and grasses are dark against the bright background.

If we can meet
these challenges . . .

. . . the Laboratory's future is bright