The National Nanotechnology Initiative:
Engine for Innovation and Competitiveness

Celia Merzbacher, Ph.D.

Assistant Director for Technology R&D

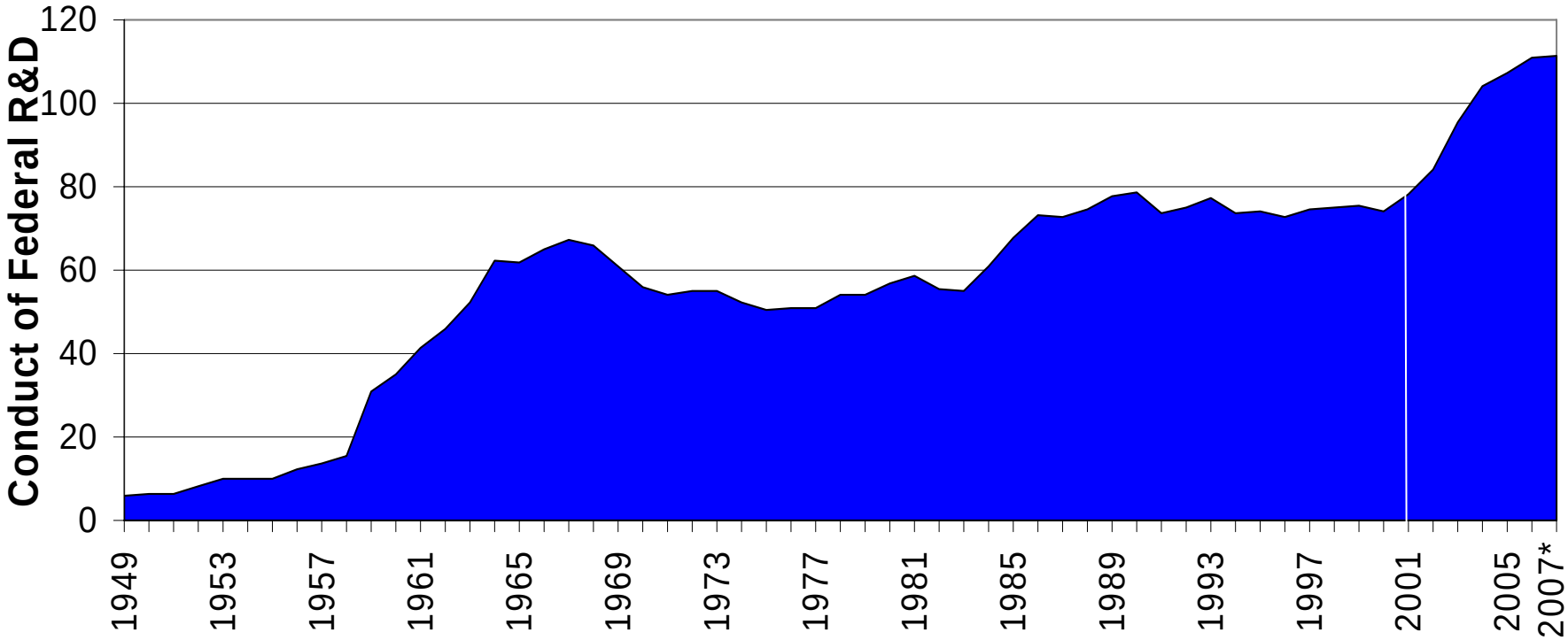
Office of Science and Technology Policy

Executive Office of the President

Commercialization of Nanomaterials 2006

*19 Sept 2006 * Pittsburgh*

Federal R&D Spending
(Outlays in billions, constant 2000 dollars)



*President's 2007 Budget

FY2007 Request is $137.2 billion

“First, I propose to double the federal commitment to the most critical basic research programs in the physical sciences over the next 10 years. This funding will support the work of America's most creative minds as they explore promising areas such as *nanotechnology*, supercomputing, and alternative energy sources.”

ꟹ President George Bush (2006 State of the Union)

American Competitiveness Initiative

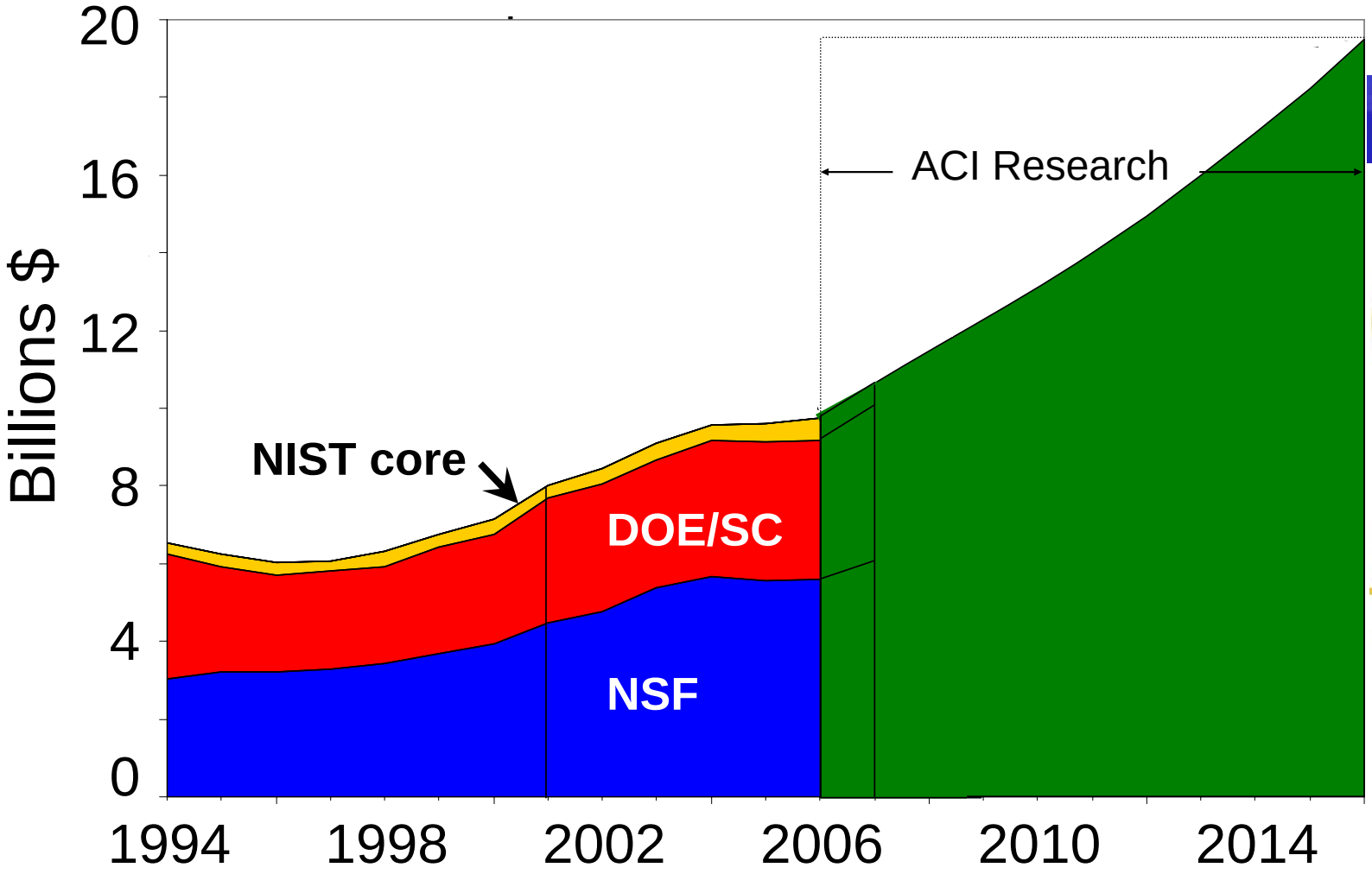
- ✓ **Federal research**
- ✓ **Private sector research**
- ✓ **Workforce training**
- ✓ **Immigration**
- ✓ **Math & science education**

★ **$5.9B in FY2007; $136B over 10 years**

ACI:
Educating Americans to Lead in Innovation

- Advanced Placement/International Baccalaureate Program
- *Math Now* for Elementary and Middle School Students
- Adjunct Teacher Corps

ACI Research in FY2007-2016



Executive Office of the President
Office of Management and Budget

Executive Office of the President
Office of Science and Technology Policy

June 23, 2006

M-06-17

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: JOHN H. MARBURGER, III
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

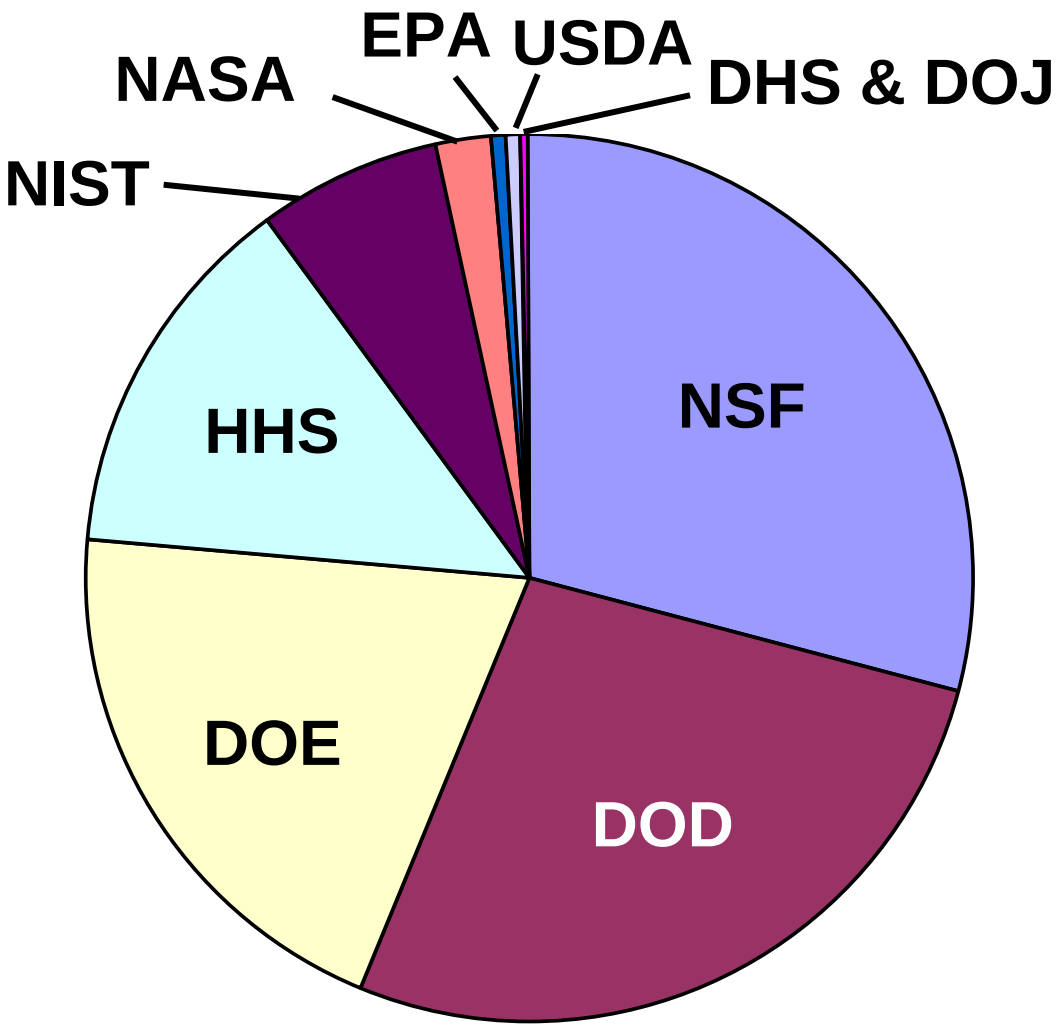
ROB PORTMAN
DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

FY 2008 R&D Budget Priorities

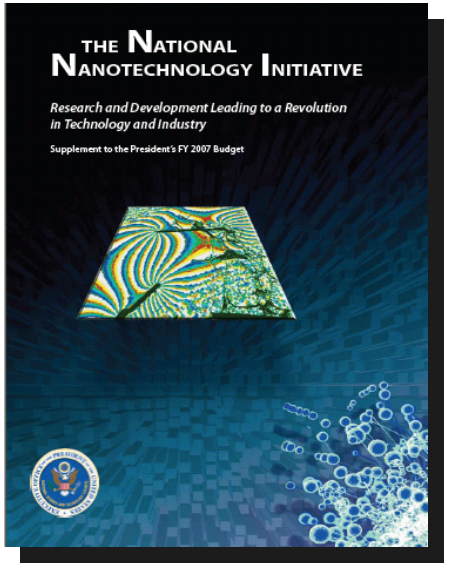
- ***American Competitiveness Initiative***
- Homeland security
- Energy security
- Advanced networking & HP computing
- Nanotechnology
- Complex biological systems
- Environment

NNI FY 2007 Budget Request

Total = $1.3 billion

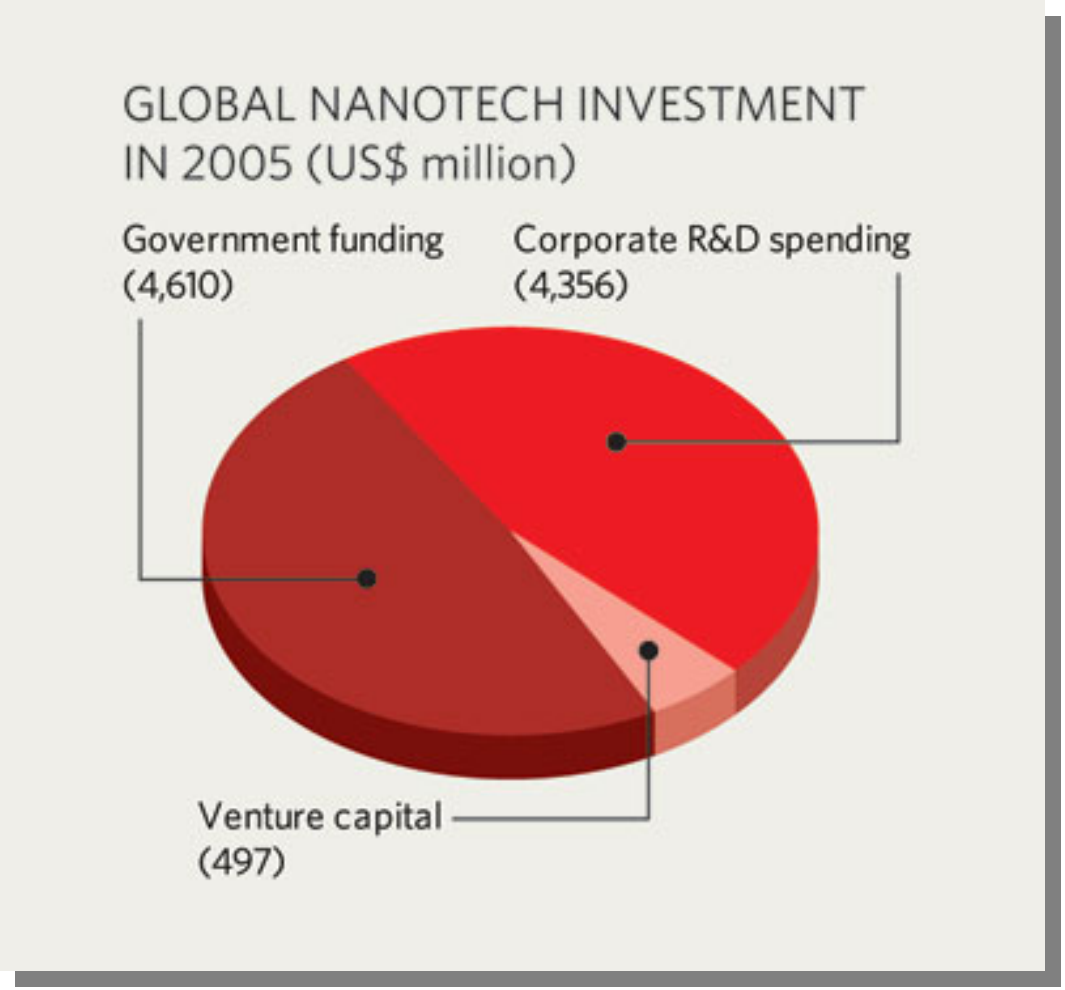


ACI agencies (NSF, DOE & NIST) 56% of total (up 14% over '06)



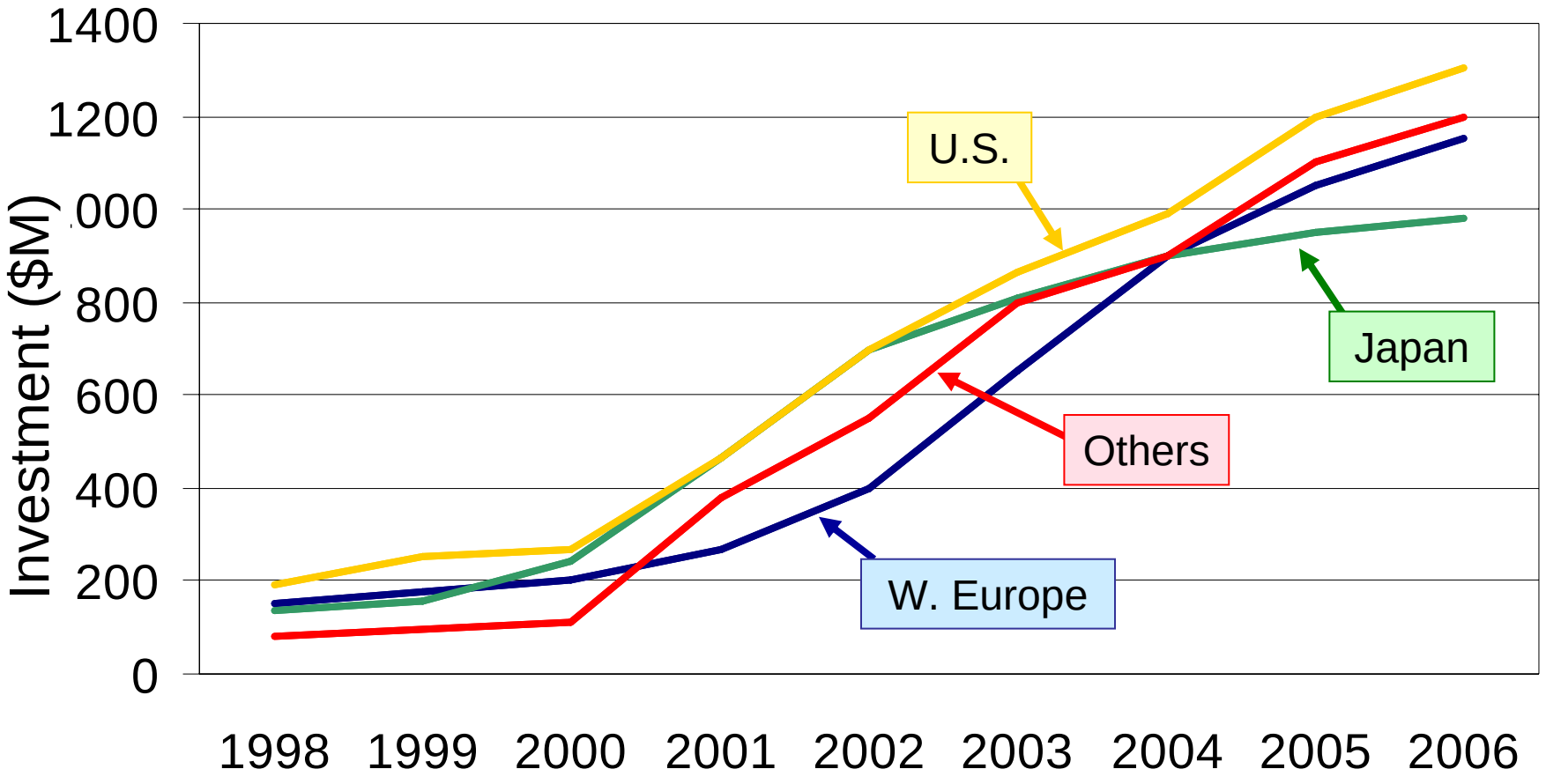
For budget details, go to www.nano.gov

Public & Private Investments in 2005



Source: Lux Research

International Nanotech R&D Investment



Source: M. C. Roco

NATIONAL CONFERENCE of STATE LEGISLATURES

Search: (Advanced Search) GO

About NCSL | State & Federal Issues | Legislatures | Legislative Staff | Meetings | Bookstore | Legislators & Staff Only

NCSL Home > *State & Federal Issues*: Issue Areas > Nanotechnology Related Legislation 2006 | Add to MyNCSL

Nanotechnology
2006 State Legislation

Last Update: August 2006

Nanotechnology is the science of the very small. This growing field is getting attention in a number of states, which are considering legislation to support nanotechnology education and economic development initiatives.

Summary Legislation has been introduced or considered in at least twenty-nine states in 2006; enacted or adopted in at least twenty-one states: Arkansas, California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Louisiana, Maryland, Massachusetts, Minnesota, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Utah, Virginia, and Washington.

Arizona

H.B. 2623

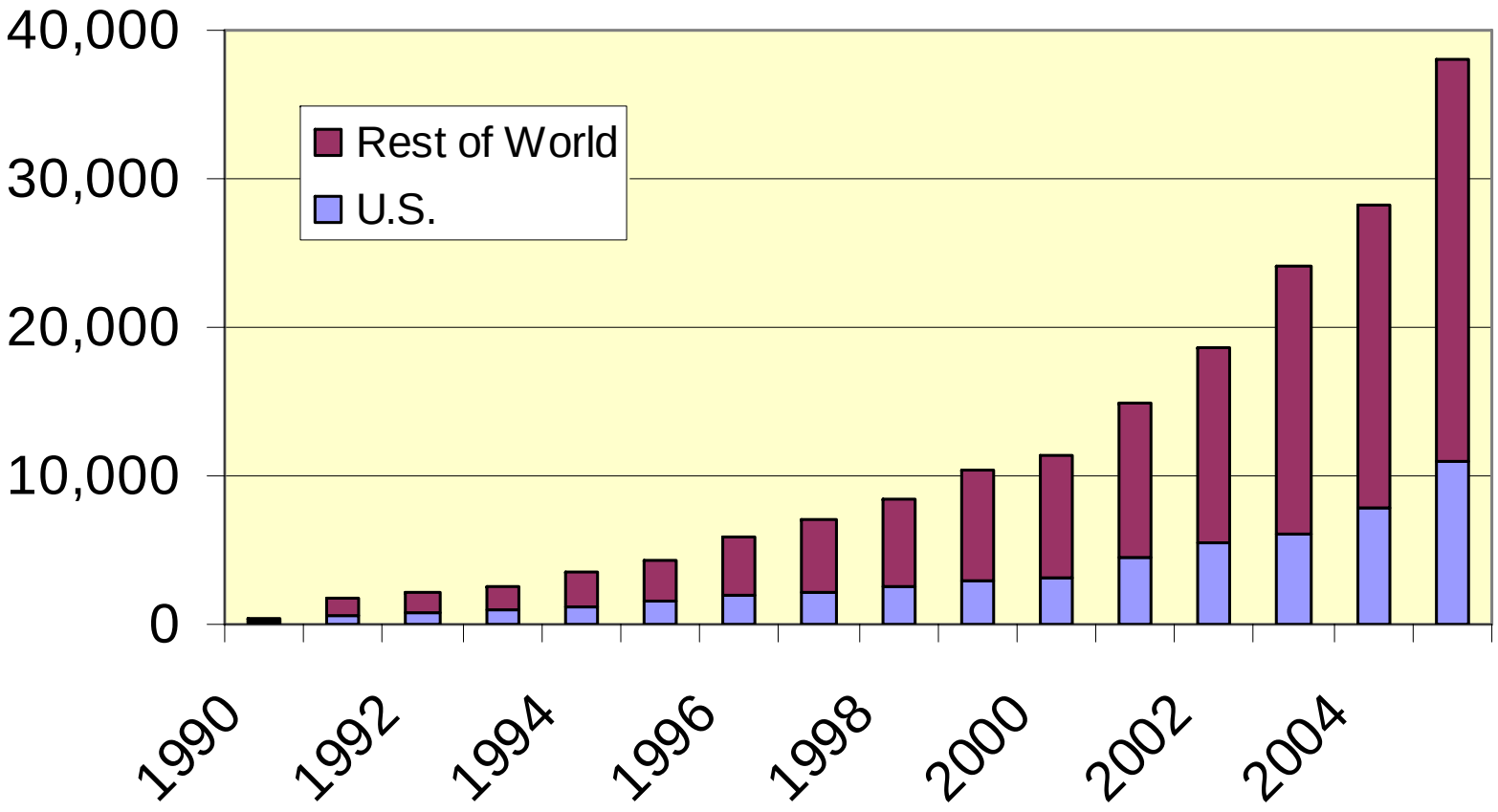
Creates 'Innovation Arizona'; includes nanotechnology as an "emerging technology industry"; establishes Innovation Arizona board of directors with eight of the members from the private sector who have experience in any of a number of listed technologies, including nanotechnology.

H.B. 2789

Creates 'Innovation Arizona'; includes nanotechnology as a "technology field"; establishes Innovation Arizona board of directors with five of the members who have experience in any of a number of listed technologies, including nanotechnology.

For more info: www.ncsl.org

Nanotechnology Publications (1990-2005)



Search of ISI Web of Science using “nano*”

U.S. Competitiveness in Nanotechnology Patent Activity

- U.S. inventors/assignees lead in the # of...
  - ✓ U.S. nano patents (4350 to date)
  - ✓ Patent publications globally
  - ✓ Inventions with patent publications in 3 or more countries

The Innovation Ecosystem

- Federal Governments
- Universities and research institutions
- State & local organizations
- Industry
- Investor community

Federal Govt Role in Innovation

- Support pre-competitive & non-competitive research and associated infrastructure
- Fund technology development that addresses Government agency needs
- Support education and workforce development
- Provide IP protection & enforcement
- Make policies that provide incentives (R&D tax credits; SBIR; Bayh-Dole)

NNI Supports Tech Transfer

- Agency-specific programs (DOD, NASA, NIH, etc.)
- SBIR/STTR solicitations
- Industry liaison groups
- Standards development (NNCO Director Clayton Teague chairs the ANSI TAG)

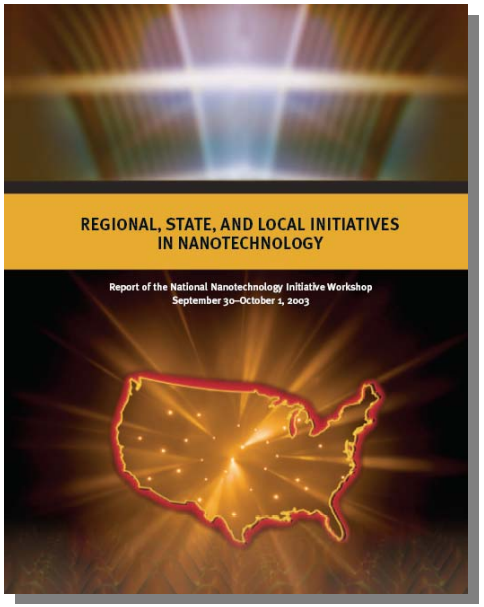
SBA

ISO International Organization for Standardization

ANSI American National Standards Institute

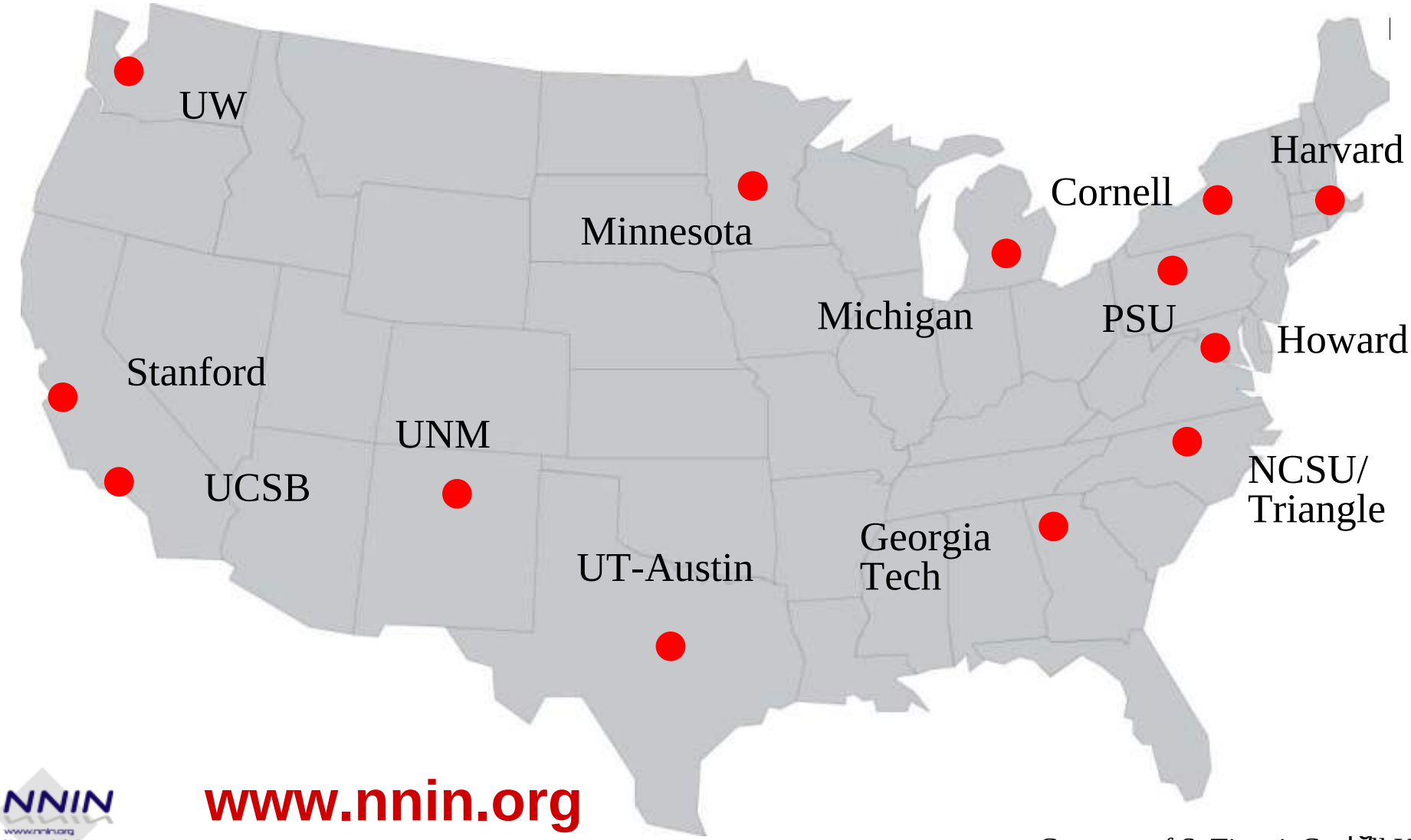
NNI Supports Tech Transfer (cont.)

- Regional, State, and Local Initiatives in Nanotechnology Workshops
  - Sept 30-Oct 1, 2003
  - Nov 3-4, 2005



- NNI-funded multi-disciplinary research centers include industry partners
- Broadly available NNI user facilities

National Nanotechnology Infrastructure Network (funded by NSF)



www.nnin.org

Courtesy of S. Tiwari, Cornell U.

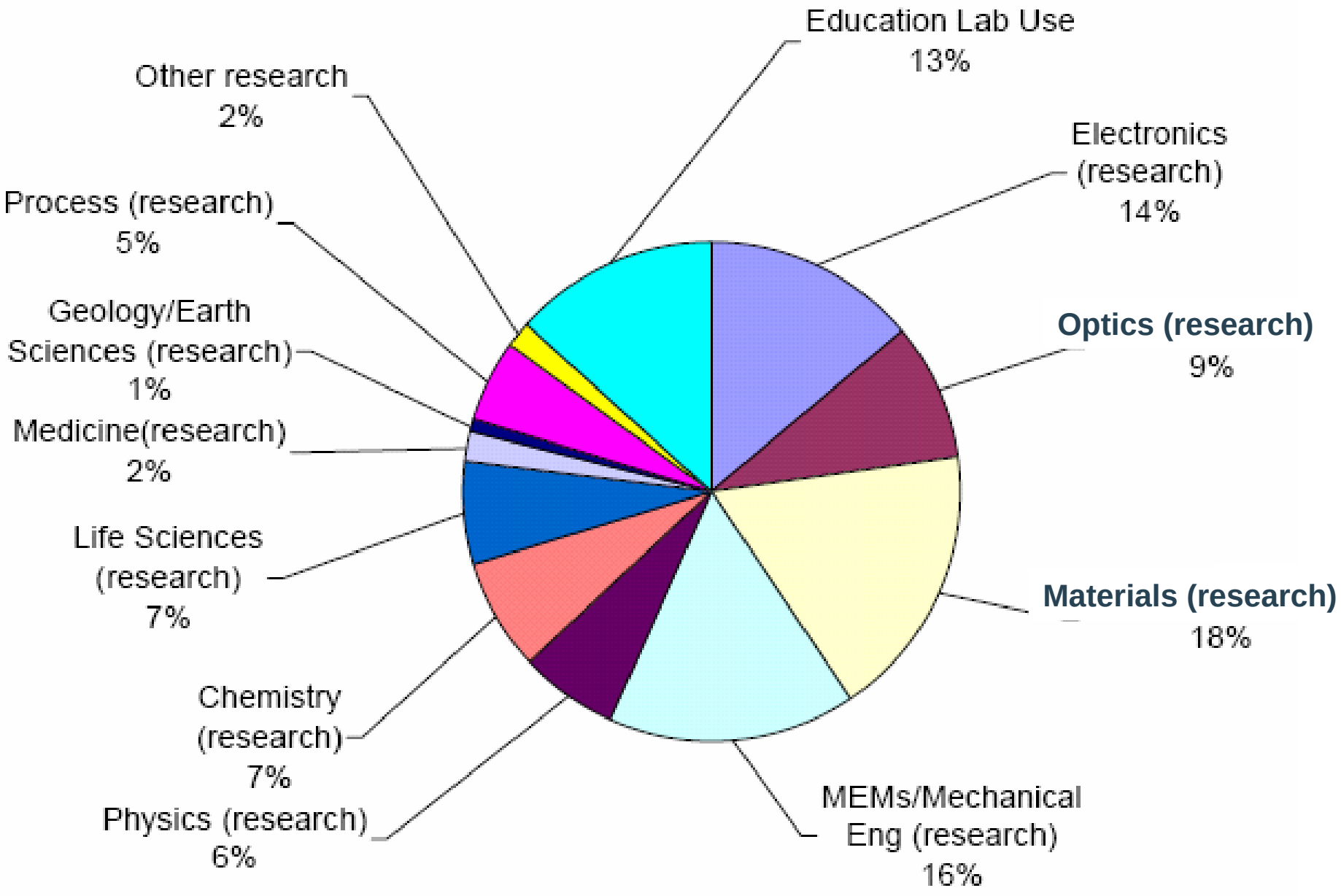
National Nanotechnology Infrastructure Network (funded by NSF)

- ✓ An integrated partnership of 13 user facilities providing ***unparalleled opportunities for nanoscience and nanotechnology research***.
- ✓ Provides extensive support in nanoscale fabrication, synthesis, characterization, modeling, design, computation and hands-on training. in an open, hands-on environment, ***available to all qualified users.***

www.nnin.org

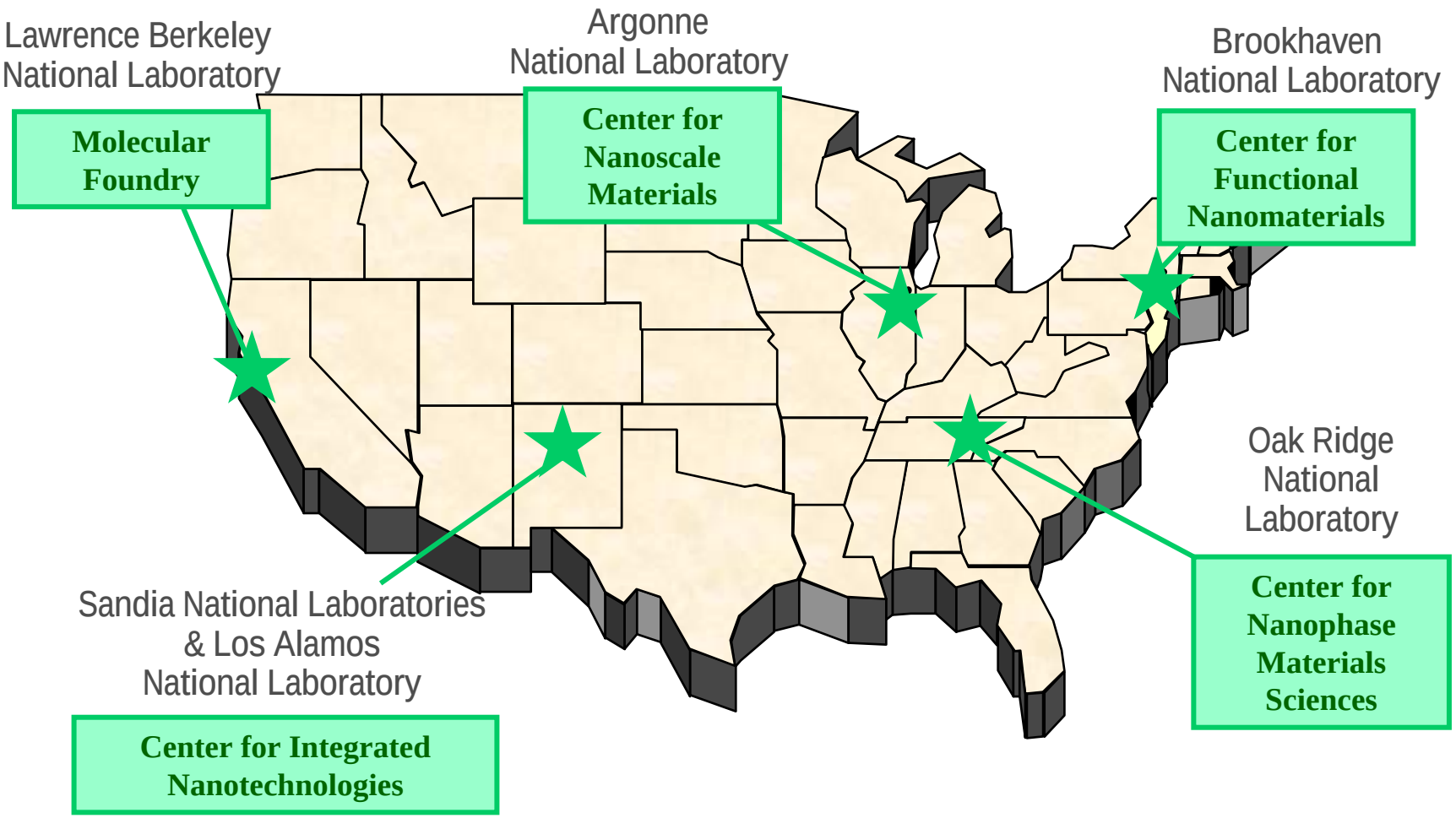
Courtesy of S. Tiwari, Cornell U.

NNIN FY2005 Use by Field (Total = 4292)



DOE Nanoscale Science Research Centers

State-of-the-art facilities



http://www.science.doe.gov/bes/NNI.htm

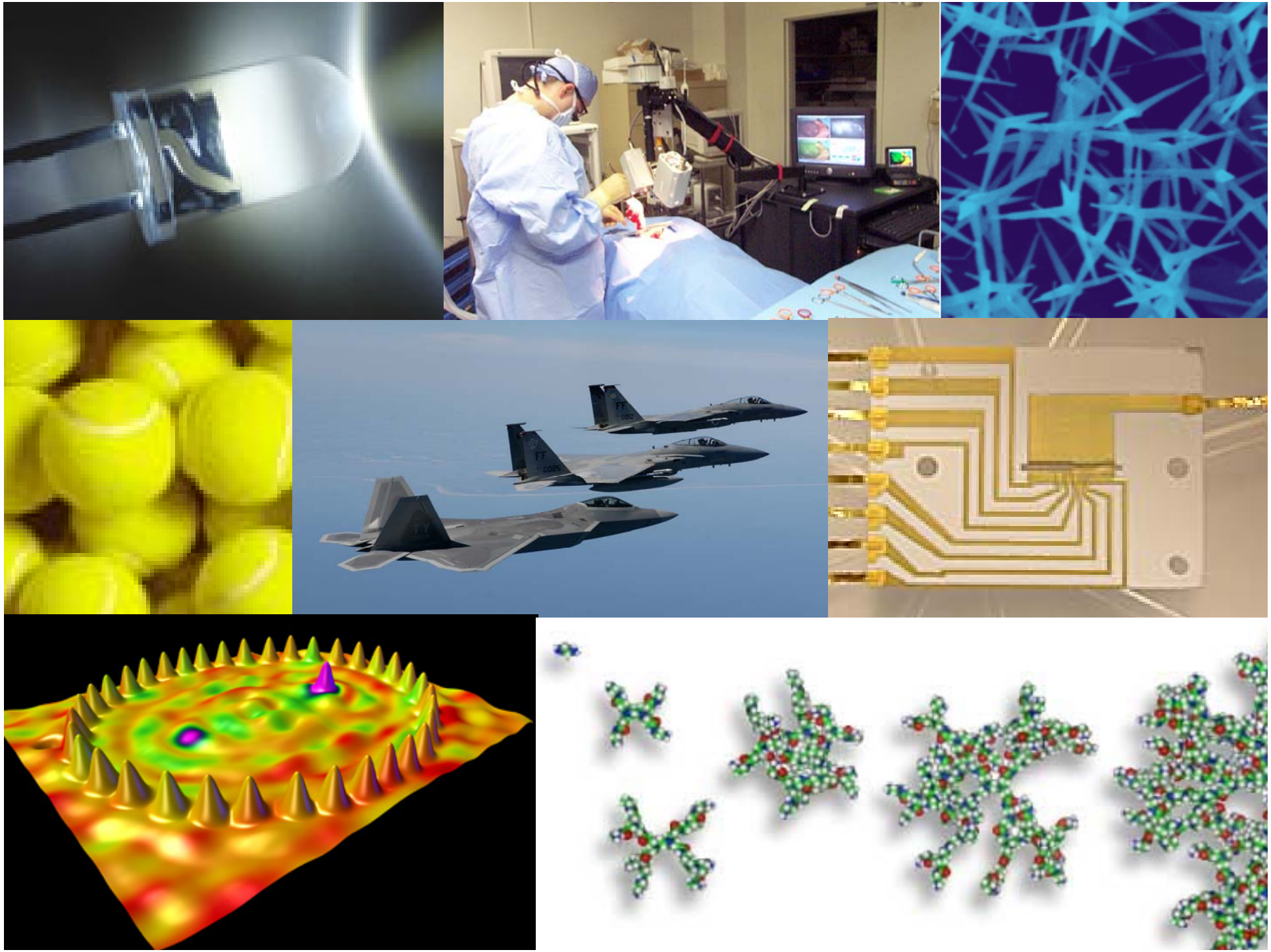
Roles of Regional, State, & Local entities

Strategically...

- Invest in R&D activities and S&T infrastructure to attract talent and funding from Fed govt & private sector
- Create policies (e.g. tax incentives) to attract, encourage, and keep businesses
- Support education and workforce development programs & institutions
- Create opportunities for partnerships & support entrepreneurs

Actions for realizing benefits and staying competitive in nanotechnology

- Do cutting-edge research, including for nanomanufacturing
- Develop standards
- Perform research for risk assessment & management
- Communicate with the public
- Rub elbows




THE WHITE HOUSE
WASHINGTON
THANK YOU