

# NIST: Promoting U.S. Innovation and Industrial Competitiveness... and How to Partner With Us

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**NIST**

**National Institute of  
Standards and Technology**

Technology Administration  
U.S. Department of Commerce



# NIST Has Two Main Campuses...

## Gaithersburg, MD



## Boulder, CO



- 2,800 employees
- ~2,500 associates and facility users
- NIST Research Laboratories
- Hollings Manufacturing Extension Partnership
- Baldrige National Quality Award
- Advanced Technology Program

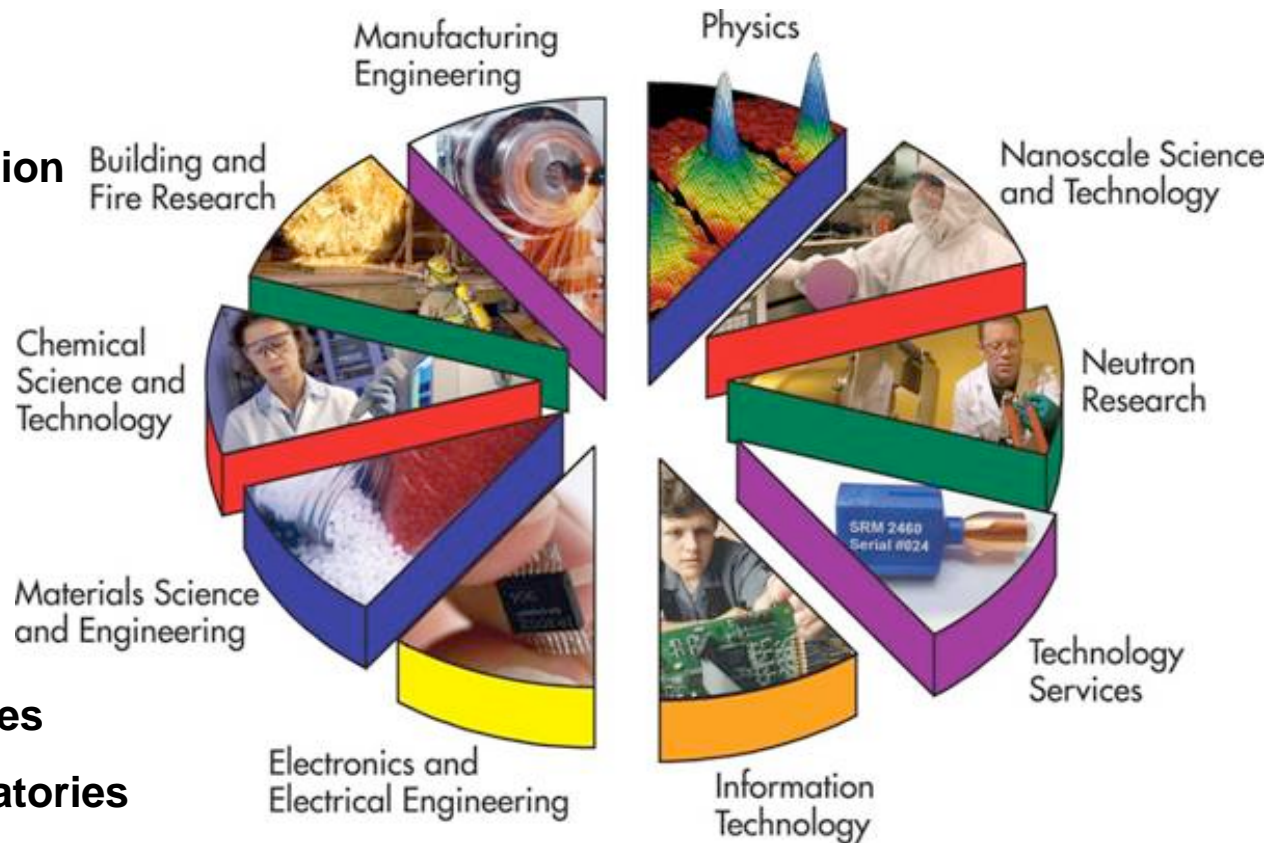
# The NIST Laboratories

## NIST's work enables

- Science
- Technology innovation
- Trade
- Public benefit

## NIST works with

- Industry
- Academia
- Other agencies
- Government agencies
- Measurement laboratories
- Standards organizations





**NIST has...**

**...world-class staff**



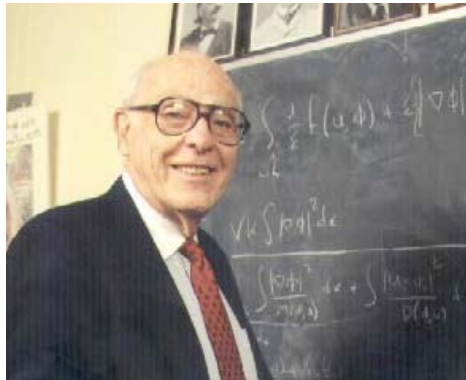
Jan Hall  
2005 Nobel Prize  
in Physics



Eric Cornell  
2001 Nobel Prize  
in Physics



Bill Phillips  
1997 Nobel Prize  
in Physics



John Cahn  
1998 National Medal of  
Science



Anneke Sengers  
2003 L'Oréal-UNESCO  
Women in Science Award



Debbie Jin  
2003 MacArthur  
Fellowship

# Nation's Infrastructure

When things go well...



(Before 2003 blackout)



When things go wrong...



(During blackout)



# NIST Mission

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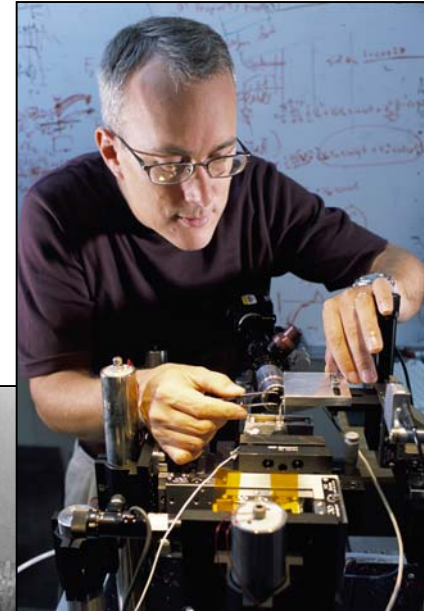
To promote U.S. innovation and industrial competitiveness by advancing

measurement science,  
standards, and  
technology

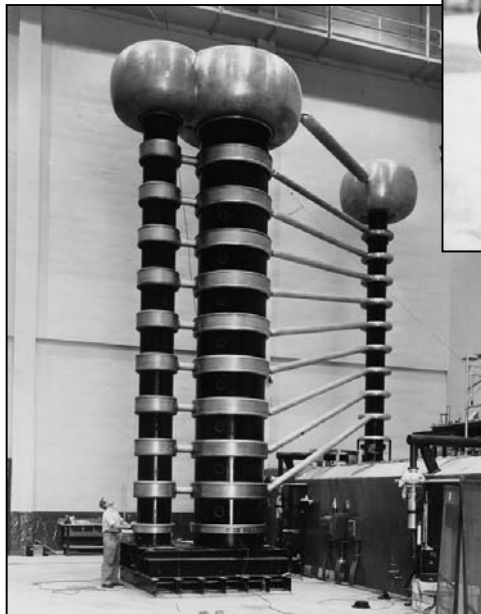
in ways that enhance economic security and improve our quality of life

# Extreme Measurements

1959



2006



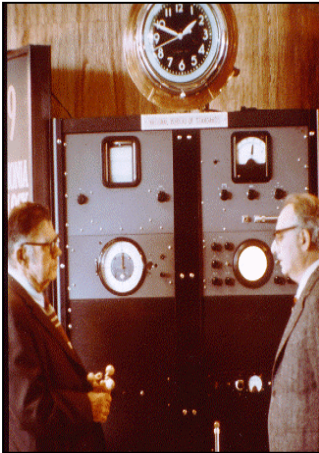
1940



1968

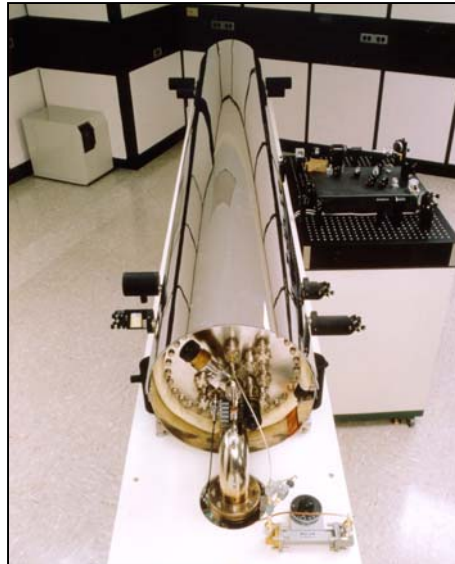


# Time Marching On ...



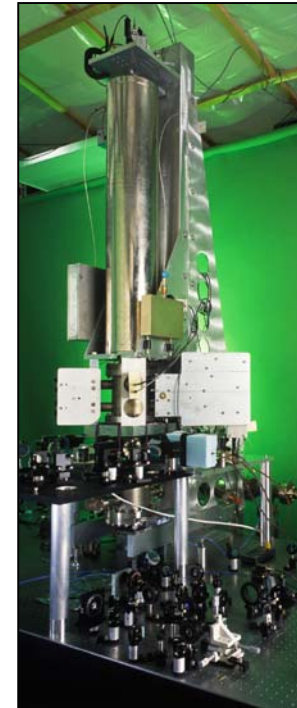
**Ammonia resonator**

1s in 300 years  
(1949)



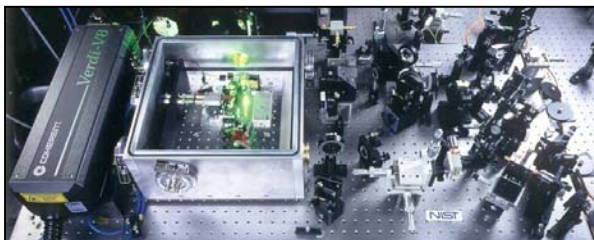
**NIST 7**

1s in 6 million years  
(1993)



**NIST F1**

1s in 60 million years  
(1999)



**Optical clock:**

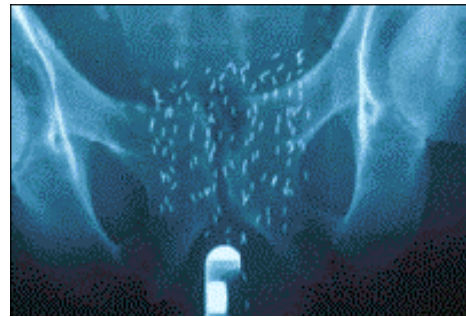
Potential accuracy of  
1s in 30 billion years



# Improving the Quality of Life...



standards for body armor



prostate and breast-cancer treatment

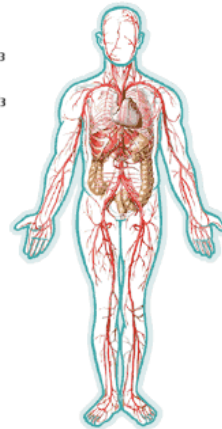
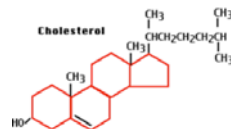
smoke detectors



standards for sulfur in fossil fuels



building and fire safety

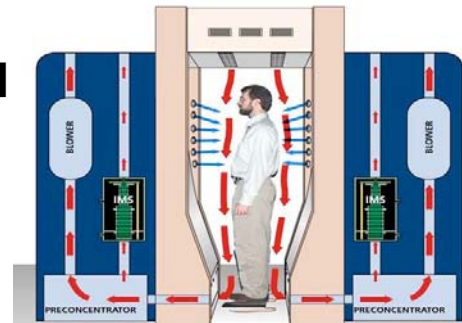


cholesterol standard reference material

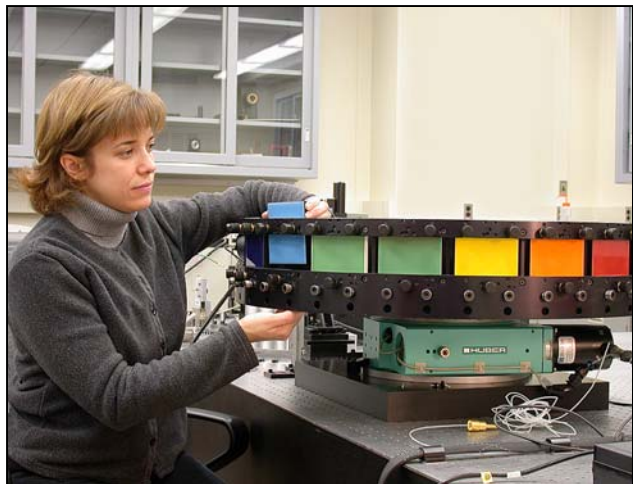
drinking water quality



trace explosives detection

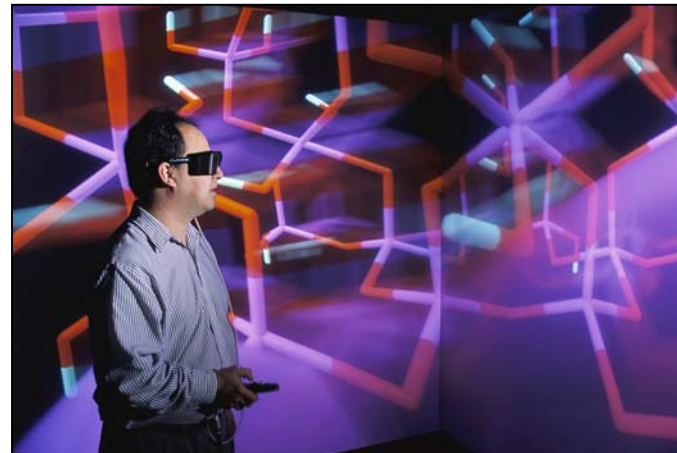


# Advancing Science and Commerce...



Maria Nadal constructed a new reference instrument for measuring the reflectance of color materials.

Leticia Pibida supports homeland security by improving the accuracy and reliability of devices that test cargo shipments for radiation.

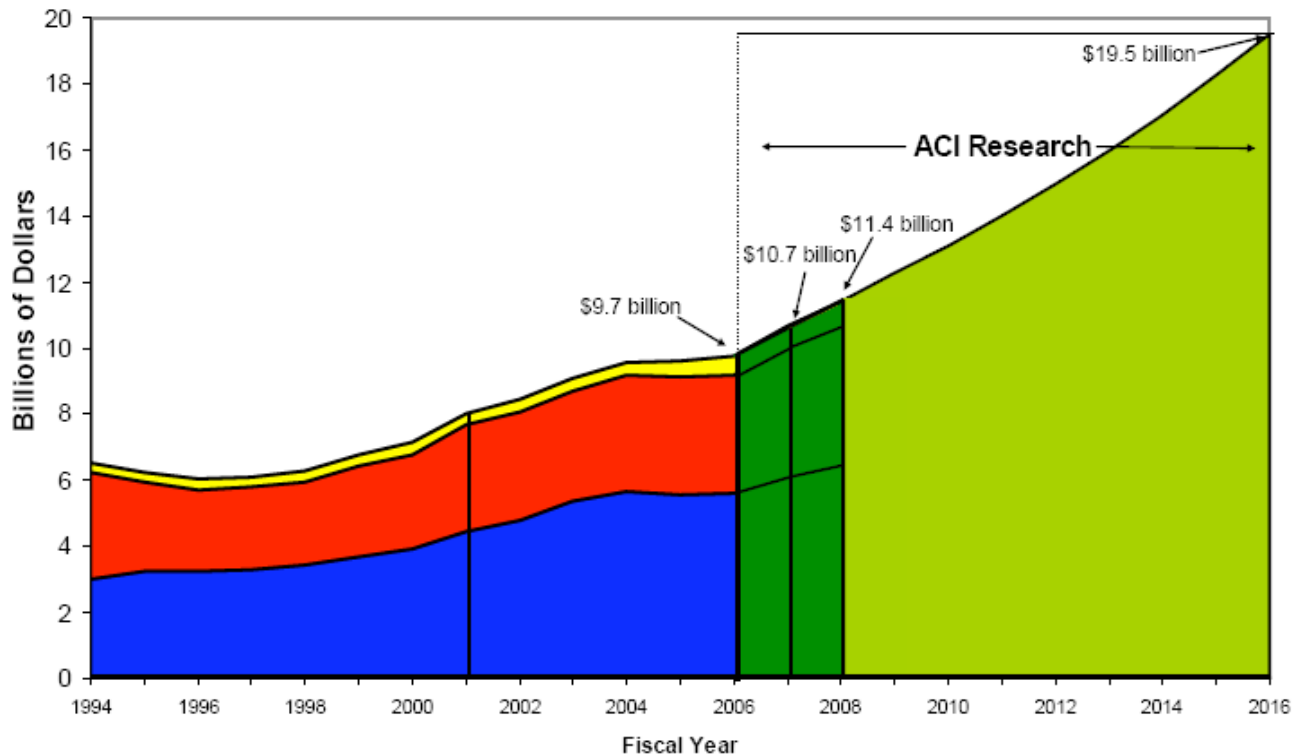


Carlos Gonzalez creating virtual “smart gels” in NIST’s 3-D visualization lab.



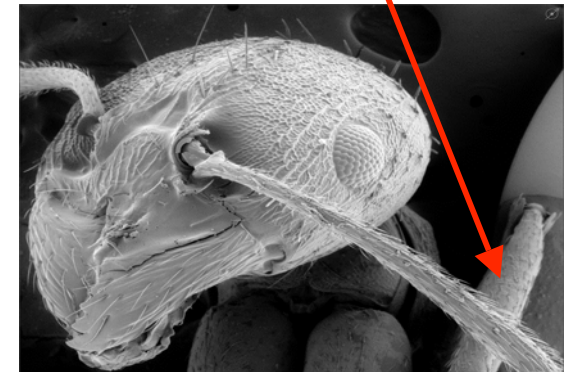
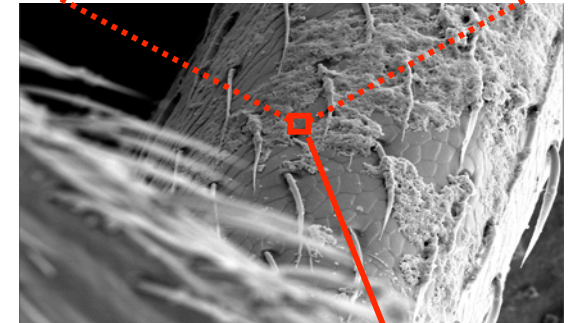
# American Competitiveness Initiative (ACI)

- Proposed in FY 2007 and continued in FY 2008 budget
- **Doubles, over 10 years, investment in:**
  - NIST core (laboratory and infrastructure)
  - National Science Foundation
  - DOE Office of Science



# Center for Nanoscale Science and Technology (CNST)

- New multidisciplinary center aimed at converting nanotechnology discovery to products
- Establish the materials and process characterization to enable scaled-up, reliable, cost effective manufacturing of nanoscale materials, structures, devices, and systems
- Partner with industry, academia, and government to turn the potential of nanotechnology into reality
- Initial focus will be on:
  - Future electronics
  - Nanofabrication and Nanomanufacturing
  - Energy



Carbon nanotube on the hair of an ant's leg



# NIST Center for Neutron Research



Preservation of pharmaceuticals

- National resource for neutron-based measurements
- “See” structure at the nanoscale
  - Uniquely sensitive to hydrogen
  - Probe magnetic structure
  - Non-destructive probe



Magnetic data storage



Chemistry of cement



Petrochemicals



Fuel cells  
H<sub>2</sub> storage materials

# NIST Training the Next Generation...

- Student Employment and Internships
  - Student Volunteer Program
  - Student Temporary Employment Program (HS through Graduate)
  - Student Career Experience Program (co-op HS through Graduate)
  - Internship Programs (including the Hispanic Association of Colleges and Universities (HACU))
- Post-Secondary Programs
  - Summer Undergraduate Research Fellowship (SURF)
  - Professional Research Experience Program (PREP)
  - NIST/NRC Postdoctoral Research Program
  - NIH/NIST Joint Postdoctoral Research Program



# Hispanic Recruitment and Community Outreach

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Promotion of NIST and Employment/Education Opportunities:

- Society of Chicanos and Native Americans in Science (SACNAS)
- Society of Hispanic Professional Engineers (SHPE)
- Association of Latino Professional in Accounting and Finance
- Society of Mexican American Engineers and Scientists (MAES)
- InterAmerican University of Puerto Rico-San German
- University of Puerto Rico, Mayaguez
- University of Texas at El Paso
- University of Texas at San Antonio
- Florida International
- Texas A&M International
- University of Texas-Pan American/MSIRP Conference

**NIST Web site:** [www.nist.gov](http://www.nist.gov)

**NIST Hispanic Liaison:** Mirta-Marie.Keyes@nist.gov

(301) 975-2042

***NIST exhibit at this conference***