

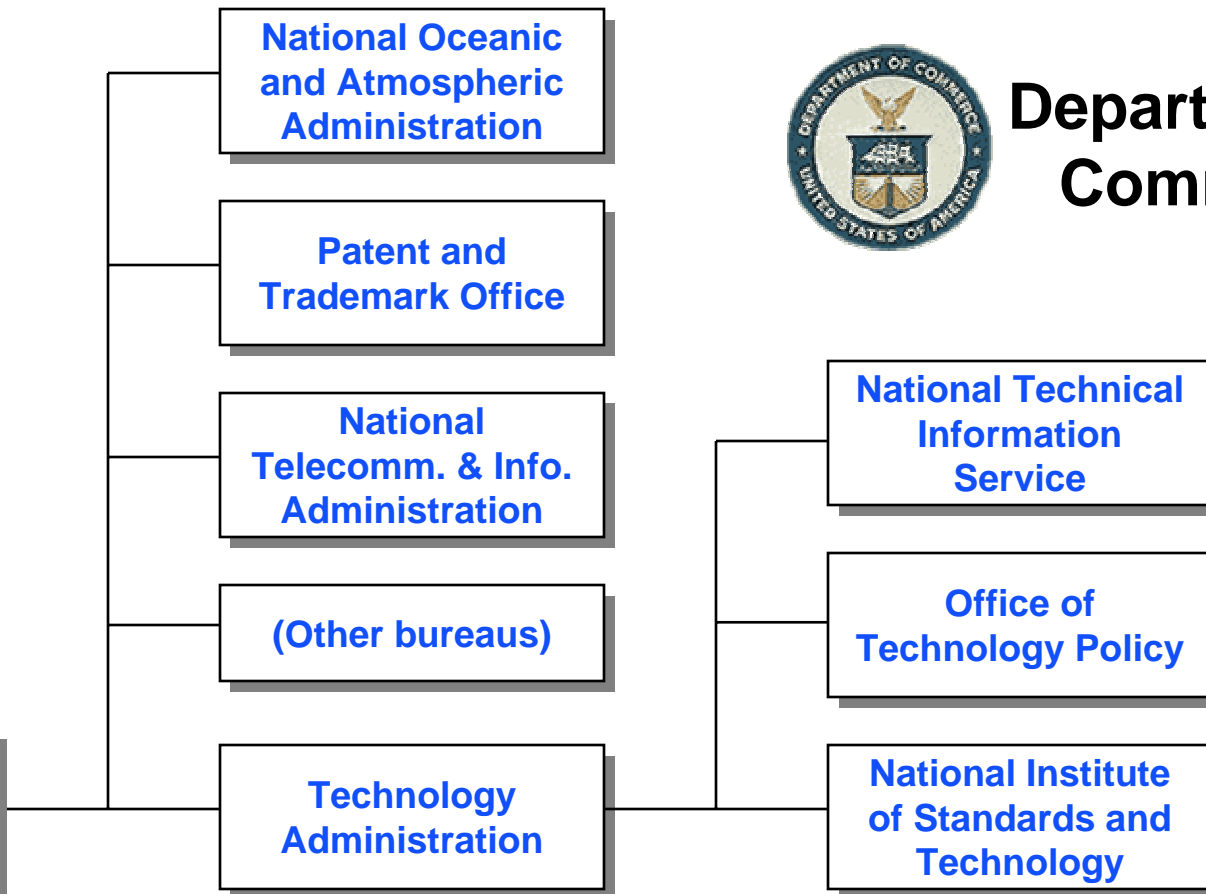


Department of Commerce



Donald Evans
Secretary

**Secretary
Deputy Secretary**



Phillip Bond
Under Secretary



Dr. Arden Bement
Interim NSF
Director



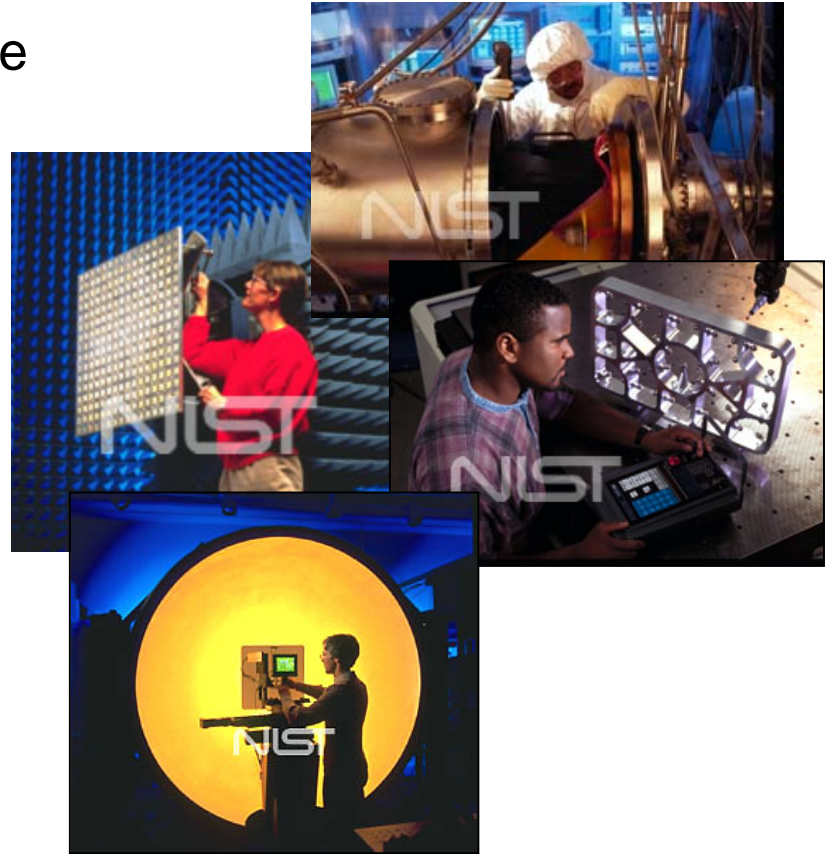
Dr. Hratch Semerjian
Acting Director

National Institute of Standards and Technology

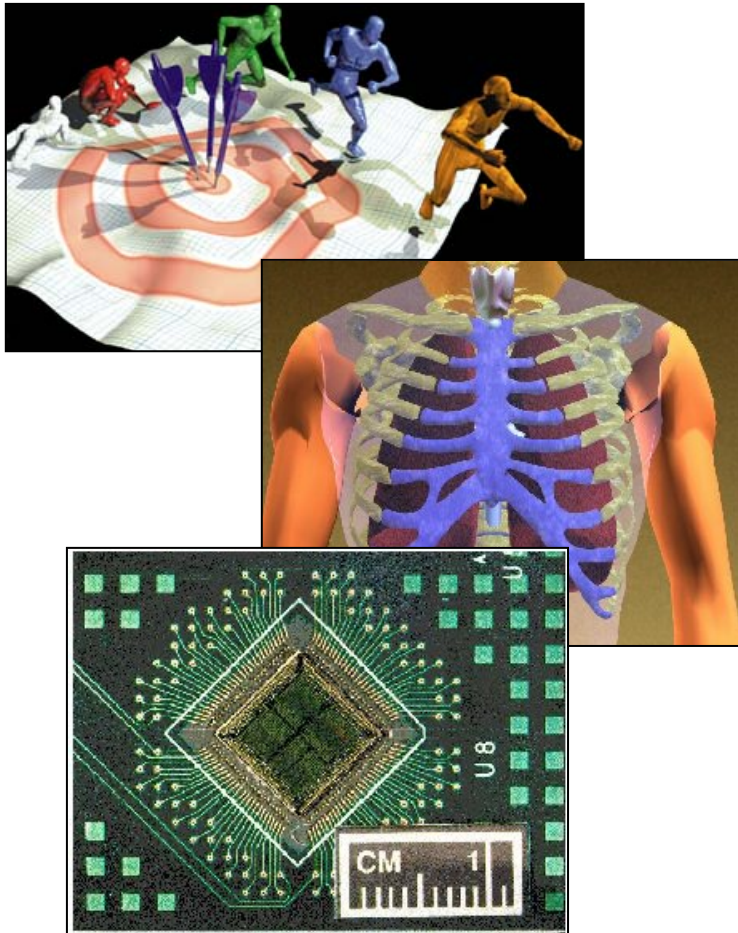
NIST's mission is to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.

NIST Assets Include:

- 3,000 employees
- 1,600 associates
- \$771 million FY 2004 operating budget
- NIST Laboratories -- National measurement standards
- Advanced Technology Program
- Manufacturing Extension Partnership
- Baldrige National Quality Award



NIST Advanced Technology Program



- Co-funding of private sector R&D to accelerate the development of high-risk, broadly enabling technologies.
- Auto Body Consortium - improved fitting of parts to save money for manufacturers and consumers
- Tissue Engineering - new materials to repair damaged ligaments and tendons: several billion dollar impact
- “DNA Chips” - new technology for cheap, rapid genetic analysis

Manufacturing Extension Partnership

- Nationwide network providing hands-on help to smaller manufacturers to become globally competitive
- **Business assistance**
 - Quality management
 - Human resource development
 - Financial planning
 - Other services
- **Technical assistance**
 - E-commerce
 - Process improvement
 - Plant layout
 - Product development
 - Energy audits
 - Other services



355,000 small U.S. manufacturers produce 55% of value added in manufactured goods, employ more than 12 million workers

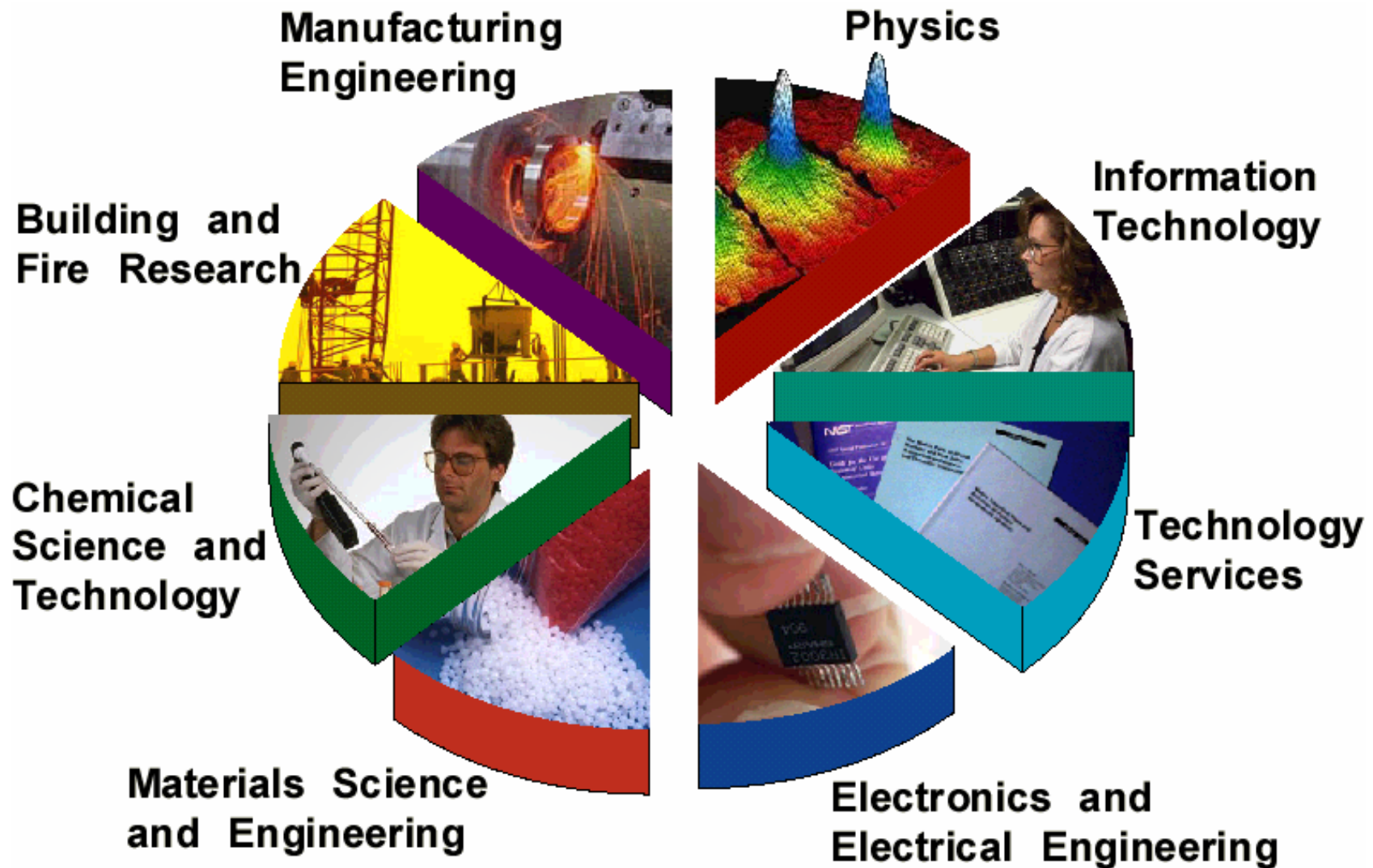
Baldrige National Quality Program



- Premier U.S. award for performance excellence and quality achievement.
- Awards in Manufacturing, Service, Small Business, Education, Health Care.
- More than 2 million copies of Criteria for Performance Excellence distributed (not including downloads from Web).
- Quality programs modeled on Baldrige: 49 state and local (up from fewer than 10 in 1990); 60 international.

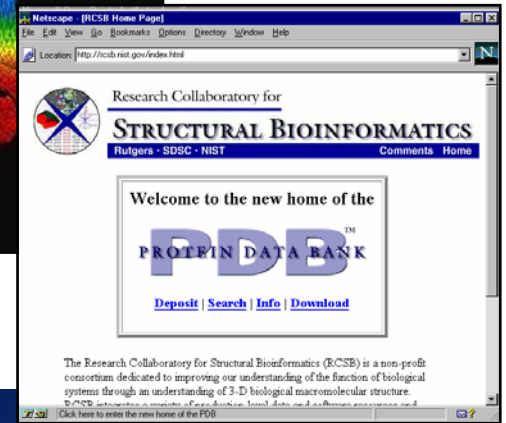
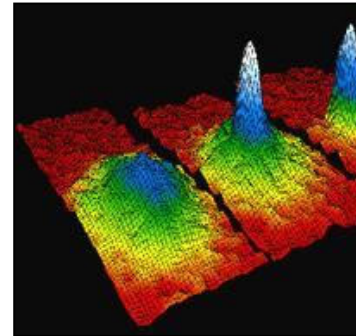


NIST's Intramural Laboratories



NIST Laboratories Products and Services

- **Measurement Research**
 - 2,200 publications/year
- **Standard Reference Data**
 - 90 types available
 - 5,500 units sold/ year
- **Standard Reference Materials**
 - >1,300 products available
 - 31,000 units sold/year
- **Calibrations and Tests**
 - 3,000 items calibrated/year
- **Laboratory Accreditation**
 - 819 accreditations
- **Standards Committees**
 - 440 NIST staff, 970 committees



Unique Mission and Focus

To develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.

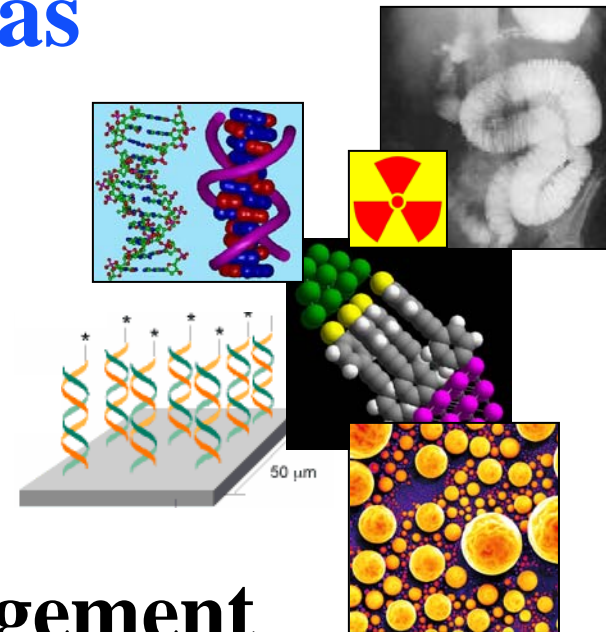
NIST 2010 Strategic Focus Areas

⇒ **Biosystems and Health**

⇒ **Nanotechnology**

⇒ **Homeland Security**

⇒ **Information/Knowledge Management**



What NIST Brings to a Partnership

- **Unique mission**
- **World renowned scientists and engineers**
- **Unique capabilities and facilities**
- **Strong relationship with industry**
- **Strong history of partnership with industry, universities and other government agencies**

Quantitative Physical Measurements

World Renowned Scientists and Engineers



Bill Phillips
*1997 Nobel Prize in
Physics*



Gregory Linteris
*Flew 2 Space Shuttle
Missions*



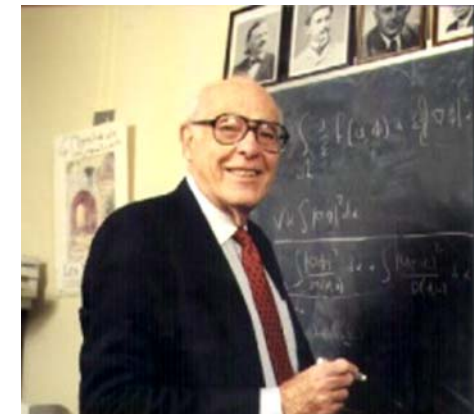
Johanna Sengers
*2003 Women in Science
Award and NAS Member*



Eric Cornell
*2001 Nobel Prize in
Physics*



Deborah S. Jin
*2003 MacArthur
Fellowship 'Genius Grant'*



John Cahn
*1998 National Medal of
Science*

NIST laboratories occupy two campuses...

Gaithersburg, MD



Boulder, CO



..and two joint Institutes

CARB
University of Maryland



JILA
University of Colorado



NIST has Unparalleled Facilities



Gaithersburg, MD Site

- 578 acre site
- Laboratory space: ~700,00 assignable sq ft.
- Office space: ~500,00 assignable sq ft.

Advanced Measurement Laboratory (AML)

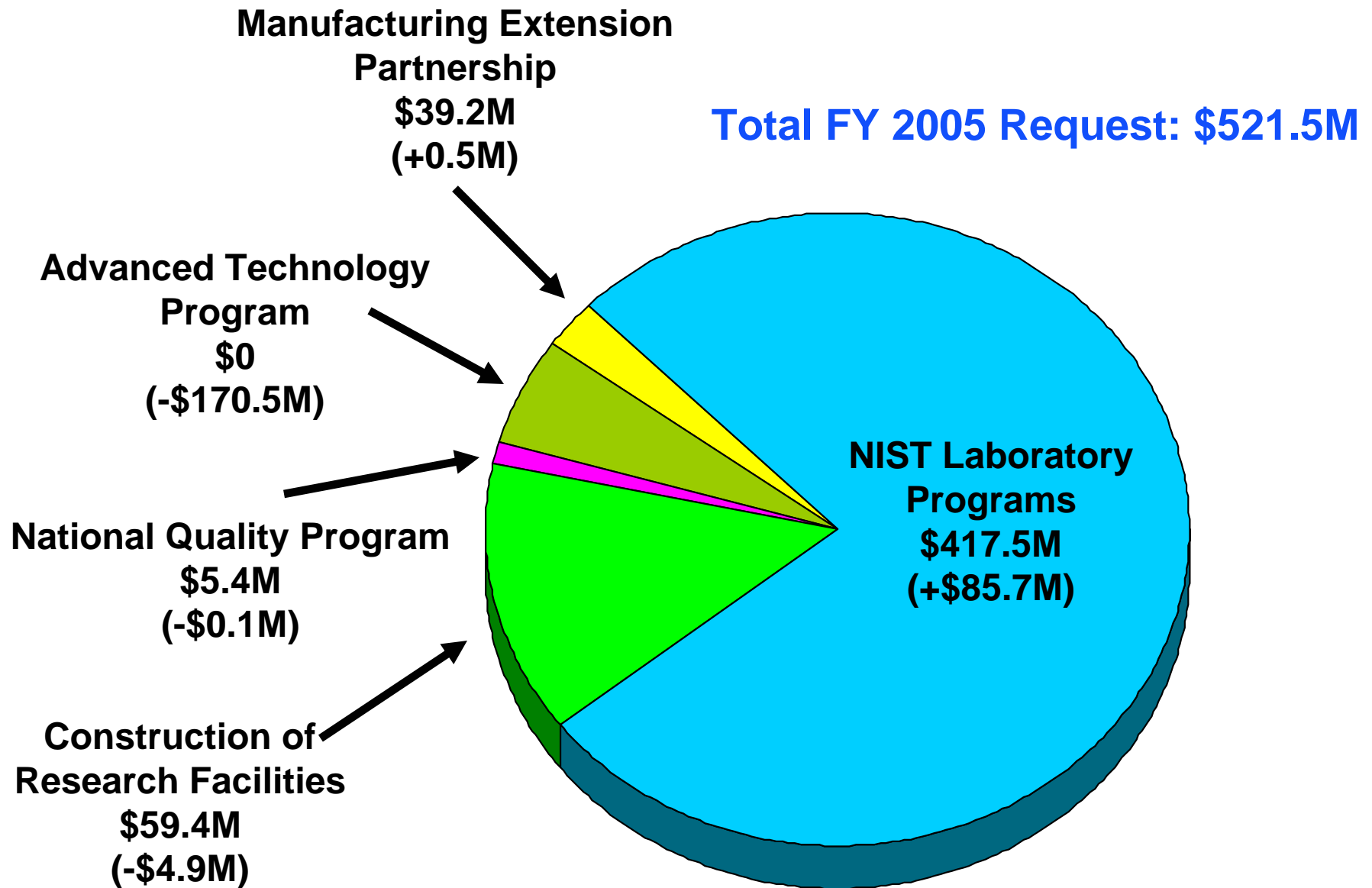
- Complex of 5 buildings, occupancy began in Jan '04
- Stringent control of temperature, vibration, humidity, cleanliness
- Establishes state-of-the-art nano-fabrication capabilities, in the ~90,000 sq ft Cleanroom Building



The NIST Center for Neutron Research (NCNR) Guidehall

- the only U.S. capability for studies of biological dynamics, both temporal and spatial information are obtained.
- Neutron methods at the NCNR encompass an enormous range of time and length scales.

President's FY 2005 Budget Request for NIST Compared to FY 2004 Enacted



Advances in Manufacturing (\$15.6M)

Advances in measurement technology are needed to support sustained, superior innovation in 21st century manufacturing.

NIST solutions:

Research initiative focusing on four strategic measurement capabilities and activities with an emphasis on cooperative research with the private sector

- Nanomanufacturing Research (\$8.0M)
- Nanometrology for Electronics and Semiconductor Industries (\$4.0M)
- Advanced Medical Technologies (\$1.6M)
- Measurements and Standards for International Trade (\$2.0M)

Advances in Measurement Science, Standards, and Services (\$16.2M)

The Nation's scientific and industrial communities are challenged to keep pace with fast-breaking developments in the forefront of science and technology.

NIST solutions:

Promoting innovation by ensuring that advanced measurements, standards, and services are available in rapidly developing technology areas:

- Expand the NIST Competence Program (\$7.5M)
- Biosystems (\$5.0M)
- Quantum Information Science (\$3.0M)
- Time Scale and Time Dissemination Services (\$0.725M)

Nanotechnology at NIST

Respond to Industry

Nanomagnetics

Develop measurement technologies for determining the properties and dynamics of magnetic nanostructures and the necessary models to explain these measurements.

Nanoelectronics

Develop enabling metrology for nanolithography, molecular electronics, and other emerging nanoscale technologies necessary to sustain Moore's Law and prepare the semiconductor industry for the beyond-CMOS era. This technological area involves the manipulation of voltages and electric currents, as embodied in nanodevices, nanocircuits and nanocircuit assemblies, or systems.

Provide the Foundation

Nanomaterials Characterization

Provide the measurement science infrastructure to enable the development and application of nanostructured materials including nanoscale thin films, nanotubes, nanoparticles and nanocomposites.

Basic Nanoscale Metrology

Develop and provide measurements traceable to fundamental units that support and enable future application of nanotechnology through measurement methods, standards and data. This work is not industry-sector specific but rather will enable several technology areas and will likely have broad impact across many segments of the economy.

Prepare for Tomorrow

Nanobiotechnology

Develop measurement science to study and manipulate individual biomolecules and biosurface interactions enabling new nanodevices, nanosystems and applications in nanotechnology.

Quantum Devices and Measurements

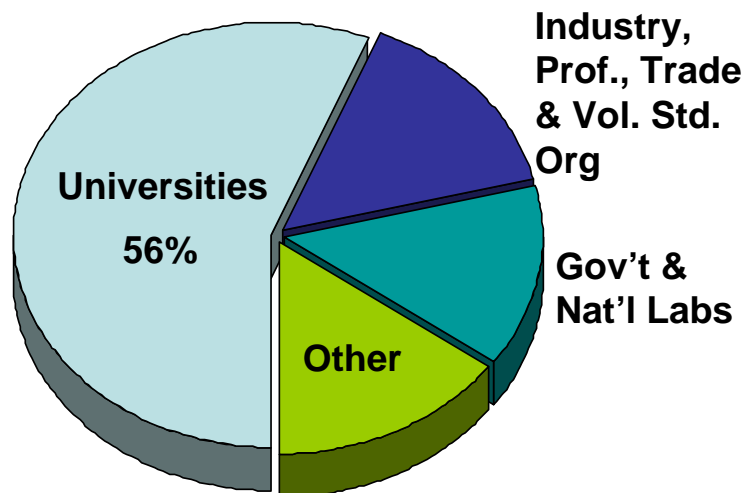
Develop science and technology of nanodevices dependent on quantum interactions in areas relating to fundamental standards, advanced measurement methods, and quantum computation.

Summary

NIST has strong relationships with

- **Industry** 76 Active CRADA Partners during FY 2003
- **Academia** Joint Programs: **CARB**, Univ of Maryland, **JILA**, Univ of Colorado and **HML**, Medical Univ. of SC & College of Charleston
- **Government agencies** New strategic efforts with DHS and NIH and others

FY 2003 Guest Scientists & Engineers In NIST Labs U.S. & Foreign Sponsors



~1300 Guest Scientists & Engineers

74% from U.S. Organizations

26% from Foreign Organizations

Additional 300 guests at the NIST Center for Neutron Research.