

NIST
National
Institute of
Standards
and Technology



...working with industry to develop and apply technology, measurements and standards

Welcome to NIST

Mary Saunders

*Chief, Standards Services Division
Technology Services*

Established as National Bureau of Standards

“It is therefore the unanimous opinion of your committee that no more essential aid could be given to **manufacturing, commerce**, the makers of scientific apparatus, the **scientific work** of the Government, of schools, colleges, and universities than by the establishment of the institution proposed in this bill.”

*House Committee on Coinage,
Weights and Measures,
May 3, 1900,
on the establishment of the
National Bureau of Standards
(now NIST)*

THE EVENING STAR, MONDAY, MARCH 11, 1901

CORRECT MEASURES

Function of the New Bureau of Standards.

LABORATORY TO BE ERECTED

Prof. Stratton, the Director, Details Need of Establishment.

A HANDICAP REMOVED



Director Stratton.

A new bureau of the government, authorized by the last Congress, will be established in this city in the near future and will give employment to a number of persons. It is to be known as the national bureau of standards and is to be under the control of the Treasury Department. A separate building for a laboratory, to cost not to exceed \$250,000, is to be erected on a site to be purchased at a cost of \$25,000.

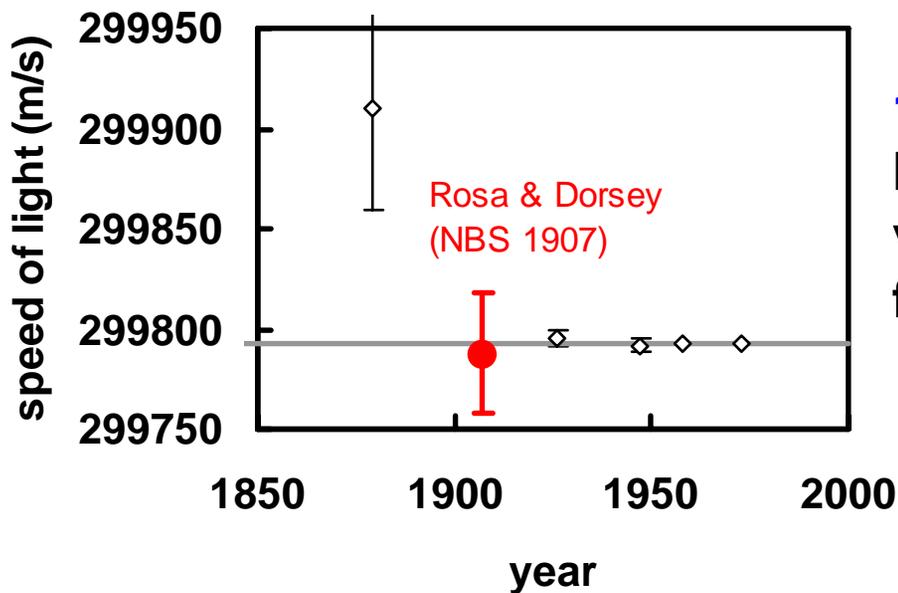
Mr. Samuel W. Stratton of Chicago has been appointed by the President to be chief of the bureau at an annual salary of \$5,000. Prof. Stratton is to have the following assistants, to be appointed by the Secretary of the Treasury: One physicist, at an annual salary of \$3,500; one chemist, at an annual salary of \$3,000; two assistant physicists or chemists, at an annual salary of \$2,500; one laboratory assistant, at \$1,400; one laboratory assistant, at \$1,200; one secretary, at \$2,000; one messenger, at \$750.

A world-class beginning



1904

World's first "neon" sign,
St. Louis World's Fair.



1907

NBS determines most accurate
value for the speed of light
from electromagnetic constants.

Early drivers for standards and measurements



1904

Out-of-town fire companies arriving at a Baltimore fire cannot couple their hoses to the hydrants. 1526 buildings razed.

1905

Standard samples program begins with standardized irons.



1912

41,578 train derailments in the previous decade lead to NBS measurement and test program

NIST's Mission and Assets

NIST's mission is to develop and promote measurement, standards, and technology to improve innovation, trade, public safety, security and jobs.

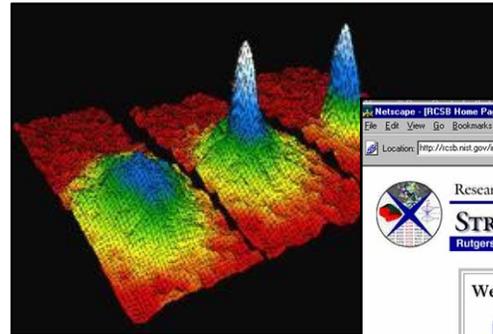
NIST Assets Include

- 3,028 employees
- 1,600 associates
- \$857.9 million FY 2005 budget
- NIST Laboratories -- National measurement standards
- Advanced Technology Program -- R&D partnerships with industry
- Manufacturing Extension Partnership -- 350 locations nationwide to help small manufacturers
- Baldrige National Quality Award



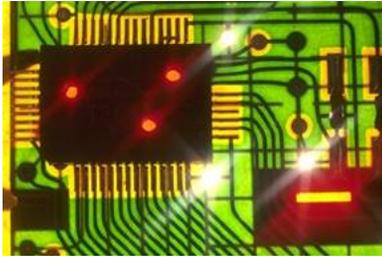
NIST Products and Services Include

- **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



NIST provides innovation infrastructure to...

...advance manufacturing and services



**semiconductor
electronics**



**“lean manufacturing” of
plastics**



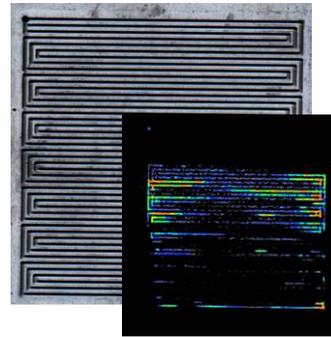
**automobile
manufacturing
interoperability**



pharmaceuticals



chemicals



**fuel cell
technology**



healthcare

NIST provides innovation infrastructure to...

...facilitate trade



secure automated banking



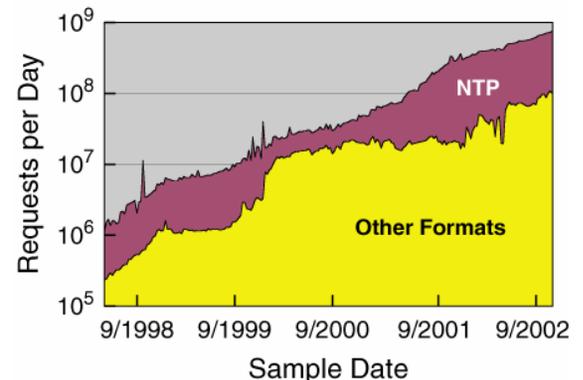
volume and flow standards



electric power metering



international standards



**www.time.gov
billions of hits daily**

NIST provides innovation infrastructure to...

...improve public safety and security



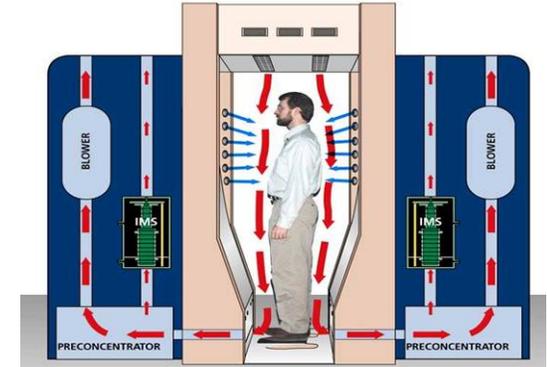
metal detectors



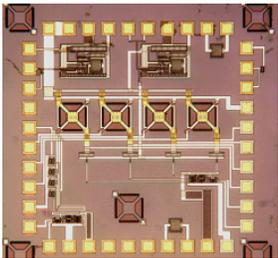
wireless interoperability among first responders



smoke detectors



Trace explosives detection portal



novel sensors to detect gases



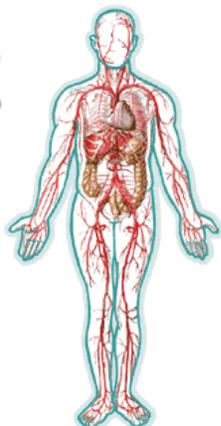
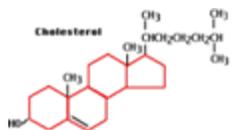
altimeter calibration

standards for body armor



NIST provides innovation infrastructure to...

... improve quality of life



cholesterol standard
reference material

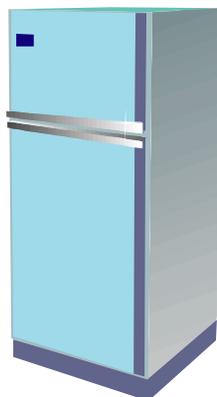


drinking water quality



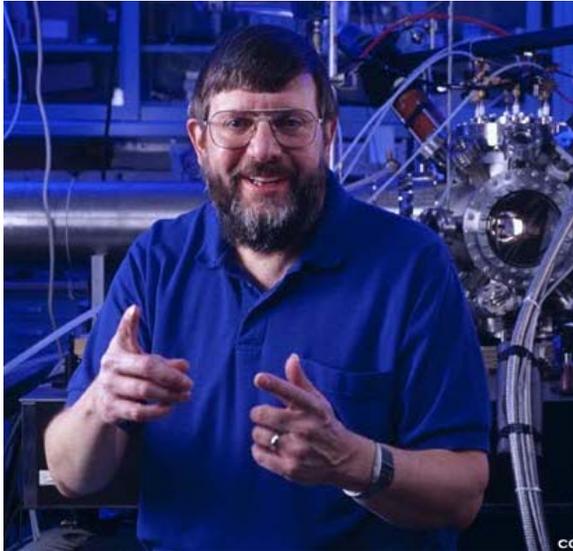
prostate and breast-
cancer treatment

database and
measurements
for alternative refrigerants



standards for sulfur
in fossil fuels

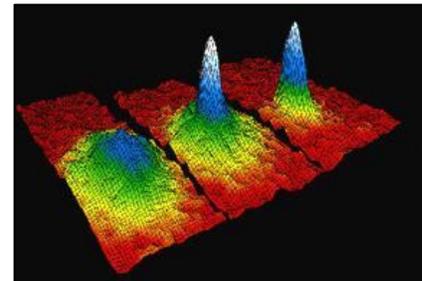
NIST Professional Staff-*World Renowned Scientists*



Bill Phillips
1997 Nobel Prize in Physics



Eric Cornell
2001 Nobel Prize in Physics



NIST has...

...unique research facilities



**Advanced Measurement
Laboratory**



ACSL

**Advanced Chemical Sciences
Laboratory**



NCNR

**NIST Center for Neutron
Research**

NIST has...

...strong partnerships



National Institute of Standards and Technology

NIST

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...strong partnerships

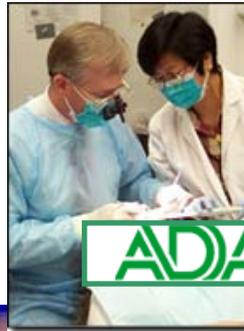
Partnerships with industry, academia, and other government agencies have been an **integral part of NIST culture** since 1901.



Hollings
Marine
Laboratory



INTERNATIONAL TECHNOLOGY
ROADMAP FOR SEMICONDUCTORS

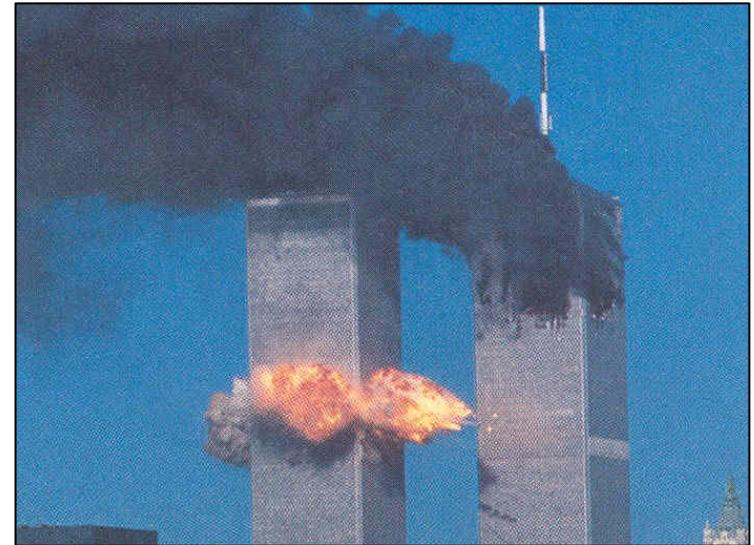


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World Trade Center investigation

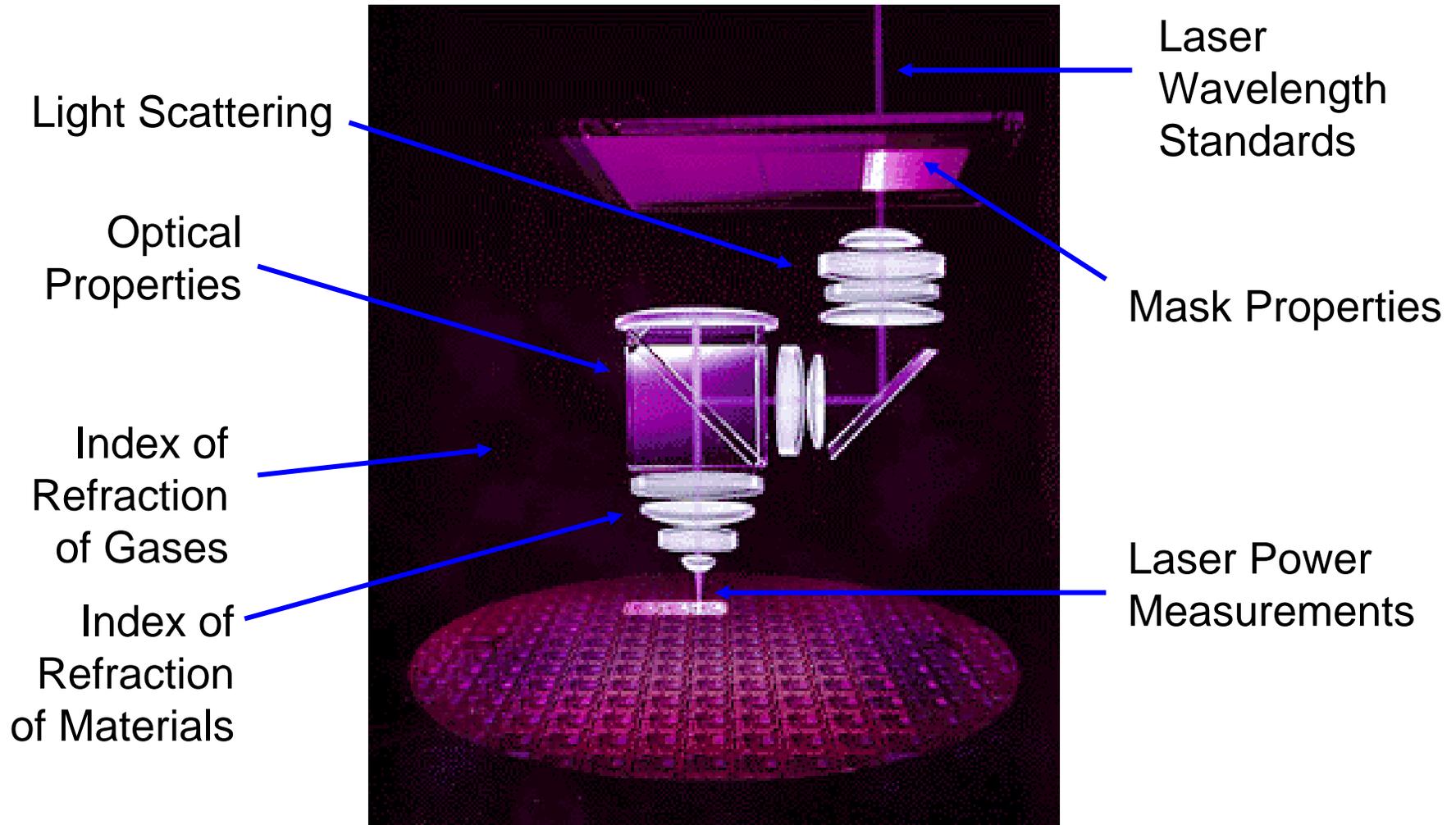
➤ NIST led a public-private partnership to determine the technical cause of the WTC collapse and apply lessons learned to improve safety, survivability and emergency response.



- NIST has received over 235 pieces of WTC steel for analysis.
- National Construction Safety Team Act
- Investigation published at wtc.nist.gov.

NIST measurements & standards for manufacturing

Lithography for etching silicon wafers



International MRA Workshop

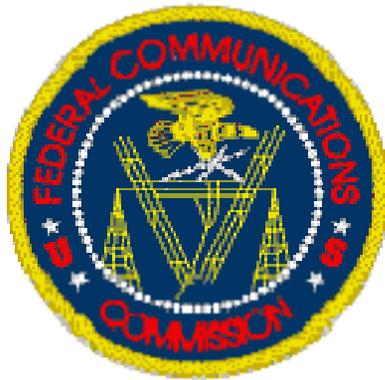
Participation: 170 individuals from Telecommunication Regulatory Authorities, Other Government Agencies, Test Laboratories, Certification Bodies, Accreditation Bodies, Regional Accreditation Organizations, Manufacturers, Trade Associations, and Industry Consultants



3 Regions/3 MRAs – Europe, APEC, CITEC – Australia, Barbados, Brazil, Canada, Dominican Republic, Finland, Germany, Honduras, Italy, Japan, Korea, Mexico, Paraguay, Singapore, Sweden, Taiwan, United Kingdom, the United States, and Venezuela

MRA Workshop Hosted By

NIST, FCC, TCB Council, OAS/CITEL



NIST
National Institute of
Standards and Technology

TCBC



Overview of Agenda (1)

- **Monday, October 3**
 - World Trade Center Investigation
 - FCC Keynote: Conformity Assessment Systems in Transition: A Successful Formula for MRAs
 - ISO/IEC 17025
 - EU's Revised EMC Directive
- **Tuesday, October 4**
 - Inter-American Accreditation Cooperation
 - CITEL MRA Overview
 - ANATEL Brazil, CONATEL Paraguay, INDOTEL Dominican Republic, Industry Canada, Mexico, CONATEL Venezuela, Barbados

Overview of Agenda (2)

- **Wednesday, October 5**
 - Office of the U.S. Trade Representative
 - Technical Requirements of Japan, Singapore, and Australia
 - Voluntary Control Council for Interference, Japan
 - ASEAN MRA
- **Thursday, October 6 (2 Tracks)**
 - TCB Council Meeting
 - ANSI, NIST CAB Database
 - Advanced Technology Session:
 - MIMO and Smart Antenna

Overview of Agenda (3)

- Thursday, October 6 (2 Tracks) Con't
 - FCC Equipment Authorization Program
 - FCC Basics on Unlicensed Transmitters
 - FCC EMC Update
- Friday, October 7 (2 Tracks)
 - TCB Applications Review and Grant Conditions
 - FCC RF Safety RequirementsAdvanced Technologies Sessions:
 - 3G and Beyond
 - Applications of ZigBee Technology

Workshop Sponsors

Thanks for your Support