

NIST: Promoting U.S. Innovation and Industrial Competitiveness

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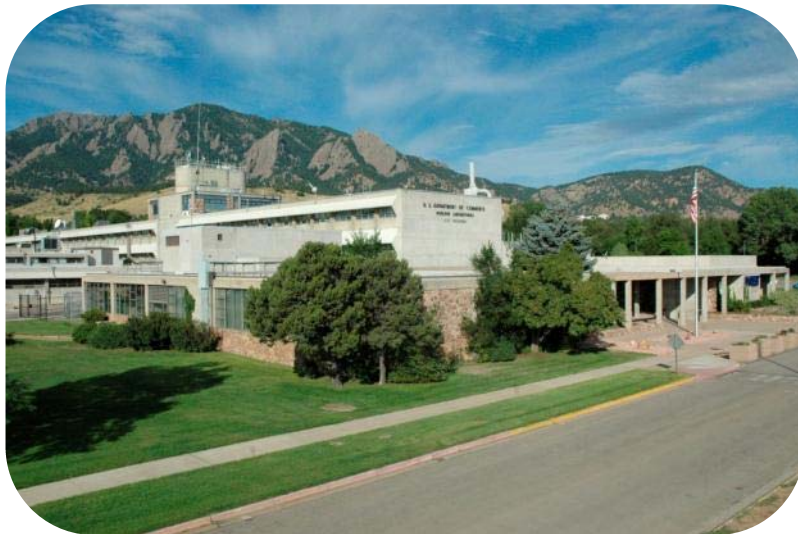


NIST – Bird's eye view

The National Institute of Standards and Technology (NIST) is where Nobel Prize-winning science meets real-world engineering.



Courtesy HDR Architecture, Inc./Steve Hall © Hedrich Blessing



G. Wheeler

With an extremely broad research portfolio, world-class facilities, national networks, and an international reach, NIST works to support industry innovation – our central mission.

NIST's Mission

- 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.

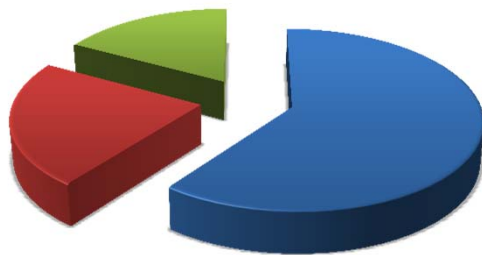


NIST: Basic Stats and Facts

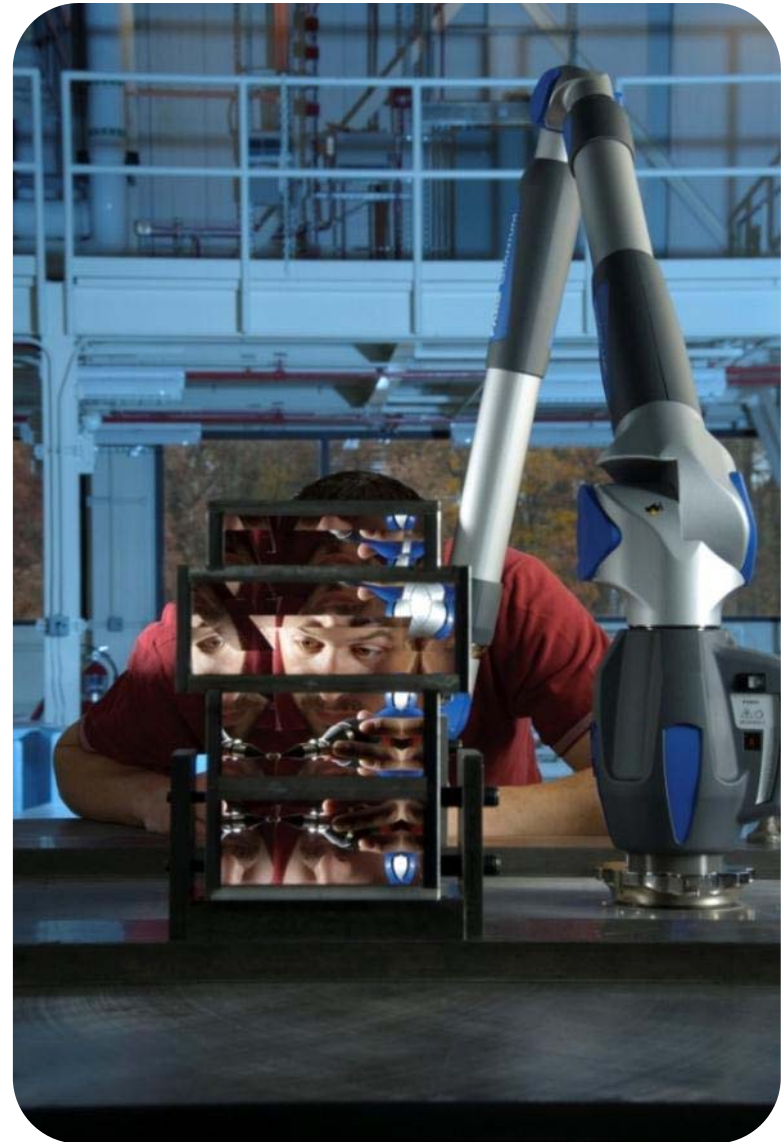
- Major assets

- ~ 3,000 employees
- ~ 2,800 associates and facilities users
- ~ 1,300 field staff in partner organizations
- Two main locations: Gaithersburg, Md., and Boulder, Colo.
- Four external collaborative institutes: basic physics, biotech, quantum, and marine science

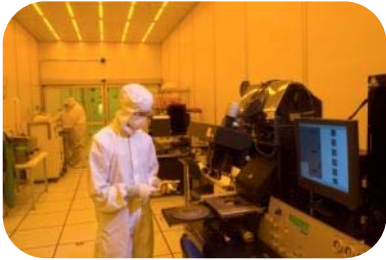
FY 2011 Appropriations \$856.6 M



- Scientific and Technical Research Services
- Industrial Technology Services
- Construction of Research Facilities



NIST Programs



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NIST Laboratories

- Providing measurement solutions for industry and the nation



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Hollings Manufacturing Extension Partnership

- Nationwide network helping smaller manufacturers compete globally



Poudre

Baldrige Performance Excellence Program

- Strengthening performance excellence in U.S. organizations



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Technology Innovation Program

- Stimulating technological innovation to meet key societal challenges

NIST Laboratories

Engineering

Nanoscale Science
and Technology



Information
Technology

Physical
Measurement

Material
Measurement

Neutron Research

NIST research has a broad impact



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Facilitates trade and fair commerce



D. Stork/shutterstock.com

Improves public safety and security



06photo

Advances manufacturing and services



B. Gardner

Improves quality, ensures uniformity

Standards

Standards solutions for national priorities

- Smart Grid, electronic health records, cloud computing, etc.

Improving U.S. government engagement in standards

- Federal interagency coordination

Conformity assessment

- 800 + laboratories accredited by NVLAP

Technical underpinnings

- NIST researchers lend their expertise to 1,000 + standards-related activities
- 100 + technical committees
- Approx. 400 staff
- Leadership in ASTM Intl., IEEE, ISO, IEC, etc.



Ryan McVay/Getty Images



NIST

National User Facilities: NIST NanoFab and the NCNR

- The Center for Nanoscale Science and Technology (CNST) NanoFab focuses on solving measurement problems hindering the development of nanotechnology.
 - 19,000 square-foot cleanroom includes 8,000 square feet of class 100 space
 - NanoFab staff are wholly dedicated to user support
- The NIST Center for Neutron Research (NCNR) is a national resource for researchers from industry, university and other government agencies.
 - Currently 28 experiment stations
 - Hosts more than 2,000 researchers annually



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NIST Research Focus Areas



Energy



Healthcare



Environment



**Information
Technology
and
Cybersecurity**



Manufacturing



**Physical
Infrastructure**

Smart Grid

•The Smart Grid is a new kind of electrical grid that will enable the “world’s largest and most complex machine” to:

- Connect with the Internet
- Prevent blackouts
- Fully integrate renewable energy sources
- Encourage conservation by helping consumers better control their energy usage



•To ensure that all the pieces of the Smart Grid will work together, NIST is harmonizing the needs of 22 stakeholder groups, comprising:

- Nearly 700 member organizations with over 1,700 member representatives from individual companies, consumer groups, U.S. government agencies and foreign countries
- July 2011: Group makes first six entries to Catalog of Standards
 - IP standards, energy usage info, vehicle charging stations, vehicles/grid communication, grid upgrading, guidelines for wireless communication

NIST and Academic Programs

- NIST's collaborations with academia, including formal programs and through academic partnerships, make significant contributions to NIST's core mission
- Strategic academic partnerships include:
 - Summer Undergraduate Research Fellowships (SURF)
 - Postdoctoral Research Associates
 - NIST Summer Institute for Middle School Science Teachers
 - Guest Researchers
 - IPAs

NIST Postdoctoral Research Associateship Program

- Congressionally-mandated program with a line item in the NIST budget (approximately \$10M per year)
- Limit of 120 slots per year, with central funding available for approximately 40
- Current Annual Salary (2012) \$65,600
- U.S. Citizenship required
- To apply, please see :
 - <http://www.nist.gov/oiaa/postdoc.cfm>
 - <http://sites.nationalacademies.org/pga/rap/>

NIST Postdoctoral Research Associateships Programs

- Provides two-year temporary appointments for outstanding scientists and engineers
- Awardees chosen through a national competition administered by the National Research Council of the National Academy of Sciences
- Research opportunities include those in chemistry, physics, materials science, mathematics, computer science, and engineering.

NIH/NBIB NIST Joint NRC Postdoctoral Research Associateship Program

- Provides two-year guest researcher appointments for up to five outstanding scientists and engineers per year
- Research Opportunities emphasize the biophysical sciences
- Each Postdoctoral Associate has two Advisers, one at NIH and one at NIST, and the Associate spends time at both institutes
- One competition per year, applications due to NRC August 1st each year
- Program can accept non-U.S. citizens
- To apply, please see:
<http://www.nist.gov/oiaa/postdoc.cfm>
<http://sites.nationalacademies.org/pga/rap/>

Summer Undergraduate Research Fellowship Program (SURF)



SURF NIST Boulder
Summer Undergraduate Research Fellowship



- SURF is a partnership, supported by NIST, NSF, and the participating colleges/universities, for students majoring in science, mathematics and engineering
- Eleven week fellowships are available in all the NIST laboratories, both in NIST Gaithersburg and NIST Boulder.
- Students apply through their respective university; grants are awarded to the university.
- The 2011 SURF Program:
 - Gaithersburg: 153 participants
 - Boulder: 18 participants
 - NIST has benefited not only from former SURF students returning for graduate or postgraduate studies, but several are now permanent NIST staff members
 - <http://www.nist.gov/surfgaithersburg/> and <http://www.nist.gov/surfboulder/>

NIST Summer Institute for Middle School Science Teachers



The NIST Summer Institute for Middle School Science Teachers, a collaboration between NIST and local school districts, is a two-week long workshop designed to support middle school science teachers through a combination of hands-on activities, lectures, tours, and visits with scientists in their laboratories. Planned to coordinate with the middle school curriculum, the teachers are provided with resources and instructional tools for teaching math and science, with an emphasis on the measurement science used at NIST. Led entirely by NIST scientists, the Summer Institute translates the cutting-edge research done in the laboratory into activities intended to be carried out in the classroom. Networking among the scientists and teachers provide long-term resources through the on-going relationships for the teachers and their students. <http://www.nist.gov/iaao/teachlearn/index.cfm>



For information about the upcoming NIST Summer Institute contact Mary Satterfield, 301/975-5364 satterfield@nist.gov or Susan Zeisler, 301/975-3111, szeisler@nist.gov

Other Academic Programs

Student Employment and Internships

- Student Volunteer Program (SVP)
- Student Temporary Employment Program (STEP)
- Student Career Experience Program (SCEP)

Tours

- Tours of selected NIST Facilities

For additional information on Student employment:

<http://www.nist.gov/hrmd/staffing/studentshome.cfm>

Additional NIST programs/outreach

The following are some of the programs that are dependent on availability of funds or are done on an *ad hoc* basis:

- Adventures in Science
- Science: Get Psyched!
- Take Our Daughters and Sons to Work Day
- Adopt-A-School
- SHIP (Student High School Internship Program)

Additional Opportunities for University Interaction

- **Guest Researchers**
- **Facility Users**

NIST Collaborations with Academia

Joint Institutes

- JILA (with University of Colorado)
- IBBR (previously CARB, with University of Maryland)
- HML (with College of Charleston, the Medical University of South Carolina, NOAA and South Carolina Department of Natural Resources)
- Joint Quantum Institute (with University of Maryland)

General:

- University of Maryland, College Park
- University of Colorado, Boulder Campus
- Utah State University
- University at Albany -State University of New York.
- University of Maryland, Baltimore County

Grant Opportunities through NIST

- **Measurement, Science, and Engineering Research Grants**

[Measurement Science and Engineering \(MSE\) Research Grant Programs \(2012-NIST-MSE-01\) FFO Document](#) (12/08/2011)

- **Precision Measurement Grants**

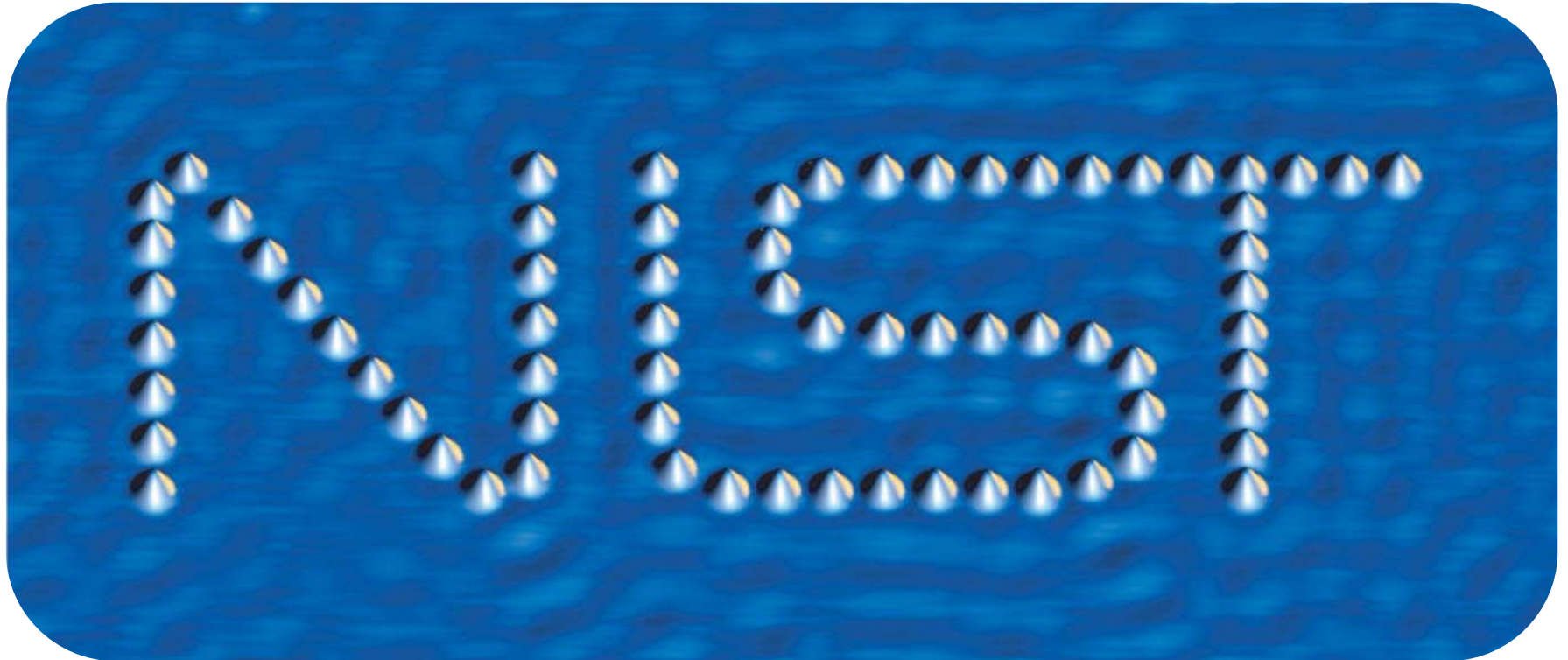
[Precision Measurement Grant Program \(2012-NIST-PMGP-01\) FFO Document](#) (12/06/2011)

- **NIST Center for Neutron Research Grants**

[NIST Center for Neutron Research \(NCNR\) Comprehensive Grant Program \(2012-NIST-NCNR-01\) FFO Document](#) (12/06/2011)

Importance of NIST ties to Academia

- Postdoctoral scientists and guest researchers from universities (both domestic and international) bring new ideas and skills, adding value to NIST research programs and aiding in achieving our core mission of promoting U.S. innovation and industrial competitiveness
- Engaging with universities in joint institutes and other university collaborations leverages our resources, adding value to research dollars, and giving support to achieving our program goals across NIST
- Undergraduate and graduate student programs at NIST provide opportunities for our nation's next generation of scientists and engineers to engage in world-class research at the premier metrology facility of the U.S., and represents part of NIST's contribution to advance the technical strength of America's future workforce



Questions?