Division Overview

Organization and Staffing

Ceramics Division
Debra L. Kaiser, Chief
Robert F. Cook, Deputy Chief

Functional Properties Group
Martin L. Green, Group Leader
5 NIST Technical Staff
3 NIST Associates

Structure Determination Methods Group
Terrell A. Vanderah, Group Leader
9 NIST Technical Staff
11 NIST Associates

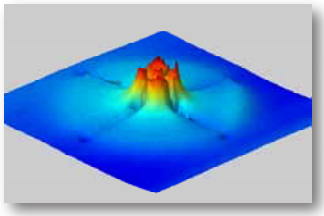
Synchrotron Methods Group
Daniel A. Fischer, Group Leader
2 NIST Technical Staff
4 NIST Associates

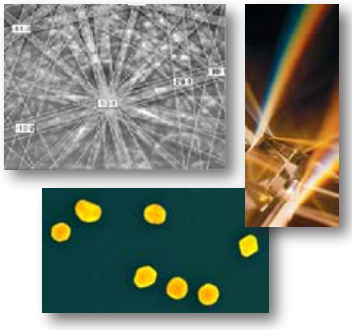
Nanomechanical Properties Group
Robert F. Cook, Group Leader
7 NIST Technical Staff
13 NIST Associates

Staffing Totals: 28 NIST Technical Staff (2 NRC Postdoctoral Fellows), 31 NIST Associates
6 Administrative and Support Staff

NIST Associates: contractors, university guest researchers, and foreign guest researchers

Technical Core Competencies





- **Mechanical Property Measurements and Standards**
  - World-class, state-of-the-art nanomechanics cleanroom laboratory
  - First reference material for calibrating cantilever spring constants in scanned probe microscopes
- **Synchrotron Measurements (at the National Synchrotron Light Source)**
  - World-class, state-of-the-art soft x-ray spectroscopy beamline
  - First-in-the-world imaging x-ray photoelectron spectroscopy beamline (2009)
- **X-ray Metrology and Standards**
  - Best-in-the-world high resolution x-ray diffraction (XRD) instrument
  - Standard reference materials used worldwide to calibrate XRD instruments
- **Phase Equilibria and Crystallography**
  - Pre-eminent ceramic phase equilibrium diagram database
  - Most comprehensive inorganic materials crystal structure database
- **Nanoparticle Measurements and Standards**
  - Release of world's first nanoparticle reference materials (down to 10 nm) for biomedical applications and evaluation of environmental, health, and safety risks

Materials Science and Engineering Laboratory Mission

To promote U.S. innovation and industrial competitiveness in the development and use of materials by advancing measurement science, measurement standards, and measurement technology in ways that enhance economic security and improve our quality of life

CERAMICS DIVISION

852-00-01b

Division Overview

Projects in MSEL Program Areas

Biomaterials:
- Dental Materials and Teeth

Ceramics:
- Ceramic Phase Equilibrium Data
- Combinatorial Measurement Methods for Inorganic Materials
- Crystallographic Databases
- Diffraction Metrology and Standards
- Measurements and Predictions of Local Structure
- Measurements and Standards for Thermoelectric Materials
- Nanocalorimetry Measurements
- Nanoscale Strength Measurements and Standards

Nanomaterials:
- Nanoindentation Measurements and Standards
- Nanoparticle Measurements and Standards for Biomedical and Health Applications
- Scanning Probe Microscopy Measurements and Standards
- Synchrotron Beamline Operations
- Synchrotron X-ray Measurement Method Development
- Synchrotron X-ray Measurements

Semiconductors:
- Nanoscale Stress Measurements and Standards
- Thin Film X-ray Reflectometry

Outputs for January 1, 2008 to April 1, 2009

Manuscripts:
- 87 refereed journal articles
- 9 conference proceedings

Standard Reference Materials (SRMs): 3
- 56 active, 3 new
- Nanoparticle and Particle RMs
- X-ray Diffraction SRMs

Standard Test Methods: 7
- Mechanical property measurements
- Nanoparticle measurements

Standard Reference Database Releases or Updates: 3
- Crystallographic Structures
- Phase Equilibria Diagrams

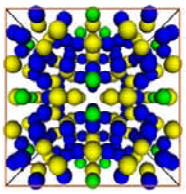
Featured Article and Cover Story
Elastic Modulus of Faceted Aluminum Nitride Nanotubes Measured by Contact Resonance Atomic Force Microscopy
Stan, G, Cook RF, et. al.
Nanotechnology **20**, 035706 (2009)

Largest Sales of a NIST SRM to a Single Vendor
SRM 1976: Instrument Response Standard for X-ray Powder Diffraction
One of the NIST X-ray Diffraction SRMs
Cline, JP

The American Ceramic Society

ASTM INTERNATIONAL
Standards Worldwide

NIST
FIZ KARLSRUHE



Learn More

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