

What is NIST?

The National Institute of Standards and Technology (NIST) is a non-regulatory federal agency within the Department of Commerce. NIST's mission is 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.



Sensor Science Division

The Sensor Science Division develops and provides national measurement standards and services to advance physical sensor science and technology in optical radiation, temperature, pressure, vacuum, and flow, and related physical phenomena.

Sensor Science Division
Gerald Fraser, Ph.D.
Division Chief
<http://www.nist.gov/pml/div685/>

Physical Measurement Laboratory
**National Institute of
Standards and Technology**
100 Bureau Drive, Mail Stop 8440
Gaithersburg, MD 20899-8440

Postdoctoral Opportunities in the *Sensor Science Division*



Capabilities

Synchrotron ultraviolet radiation facility

Low background infrared facility

Greenhouse gas emissions test bed

Contact thermometry laboratory

Absolute humidity standards

Hyperspectral imagers and projectors

Spectral responsivity measurement facilities

Spectrally tunable lighting facility

Aperture area measurement facility

Research Opportunities

Postdoctoral fellowships are available at NIST and NIST/NIH through the National Research Council.

www.national-academies.org/rap

International candidates may collaborate with NIST scientists through the guest researcher program.

Undergraduates may participate in the Summer Undergraduate Research Fellowship (SURF) program.

www.surf.nist.gov/surf2.htm

Research Projects with Points of Contact

Computational modeling of light-matter interactions

Advance the predictive modeling abilities of optical properties of materials; develop improved theories for light-matter interactions.

Scattering
Diffraction
X-ray absorption

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Optical properties of materials

Advance measurement of material properties from terahertz to extreme ultraviolet for applications in remote sensing, color, appearance, medical imaging, nano- and microscale science, security, and defense.

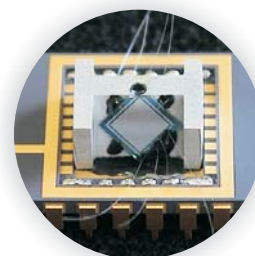
Reflectance
Transmittance
Scattering
Emittance
Fluorescence

Synchrotron Radiation Applications

Characterize optical sensors and radiometric standards; measure ultraviolet and extreme ultraviolet properties of optical materials and their degradation.

Soft x-ray
Radiation damage
VUV and EUV metrology

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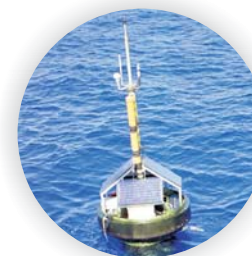
Joseph Rice
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Infrared Technology

Advance measurement of infrared radiation for applications in remote sensing, process monitoring, bio-medical imaging, security, and defense.

Cryogenic radiometry
Hyperspectral imaging
Infrared sensors

Ground and space-based remote sensing



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Characterize optical and temperature sensors for remote sensing; advance measurements of physical environmental variables; improve validation methods for space-based measurements.

Sensor calibration
Climate science
Ocean color

Measurement science for astronomy

Develop methods for relative and absolute spectroradiometric calibration of ground and space-based telescopes and celestial bodies.

Dark energy
Stellar photometry
Atmospheric transmittance

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Michael Moldover
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Measurement of greenhouse gas emissions

Improve in-situ and standoff methods for CO₂ emissions; develop sensors; improve satellite measurement of emissions and ocean carbon levels.

LIDAR and DIAL
Air monitoring
Gas sensors

Metrology for semiconductor manufacturing

Develop methods for defect inspection and optical critical dimension metrology; characterize EUV sources and optics; characterize optical properties of materials for next-generation lithographic techniques.

Holographic microscopy
Optical scatterometry
Extreme UV radiation

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Pressure and vacuum measurement and applications

Develop pressure, vacuum, and small gas flow primary standards and measurement methods for industrial applications.

Outgassing
Vacuum sensors
Process gases
Vapor pressure measurement

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Fluid Measurement and applications



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Advance measurement of fluid flow, airspeed, liquid density and volume; advance measurement and calculation of thermodynamic and transport properties of gases.

Flow measurement
Transport properties
Process streams

Temperature measurement and applications

Develop contact and non-contact temperature standards; improving ITS-90 scale; realize thermodynamic temperature; advance thermometry applications.

Boltzmann constant
Acoustic thermometry
Radiation thermometry
Noise thermometry

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Photometry, colorimetry, and solid-state lighting



Yoshi Ohno
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Develop methods and standards to support new lighting technology; quantify performance of retroreflective materials; quantify color and appearance.

Light-emitting diodes (LEDs)
Vision science