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Overview of the NIST Engineering Laboratory

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Outline

- Overview of NIST and the Engineering Laboratory
- Engineering Laboratory Strategic Goals and Smart Grid Activities
- NIST Disaster Resilience Initiative
- Examples of NIST Partners

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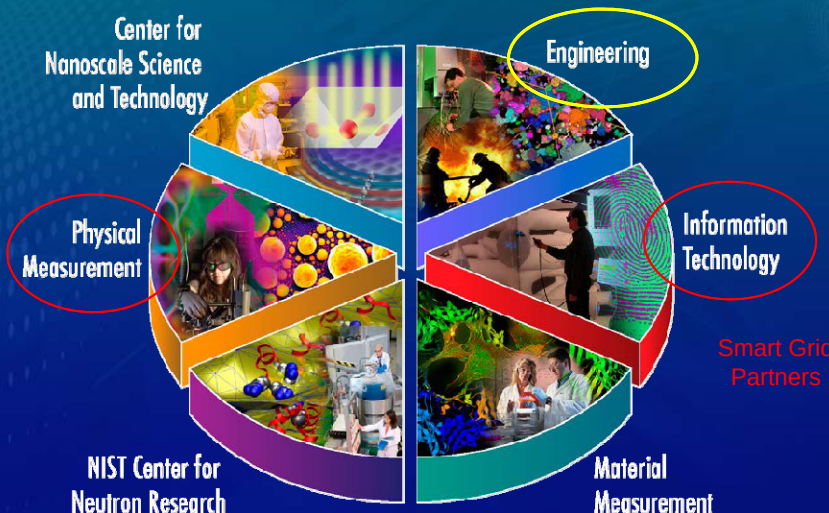
NIST Laboratories



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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

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Engineering Lab (EL) Mission

To promote U.S. *innovation* and *industrial competitiveness* in areas of critical national priority **by anticipating and meeting the measurement science and standards needs for technology-intensive manufacturing, construction, and cyber-physical systems** in ways that enhance *economic prosperity* and improve the *quality of life.*

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EL Organization

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Engineering Laboratory Strategic Goals

- Smart Manufacturing, Construction, and Cyber-Physical Systems ← Smart Grid

- Sustainable and Energy-Efficient Manufacturing, Materials, and Infrastructure ← Building Integration Into the grid

- Disaster-Resilient Buildings, Infrastructure, and Communities ← Energy infrastructure and resilience

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Smart Manufacturing, Construction, and Cyber-Physical Systems

- Smart Grid and Cyber-Physical Systems
- Smart Manufacturing Processes and Equipment
- Next-Generation Robotics and Automation
- Smart Manufacturing and Construction Systems
- Systems Integration for Manufacturing and Construction Applications

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Sustainable and Energy-Efficient Manufacturing, Materials, and Infrastructure

- Building Integration into the Grid
- Net-Zero Energy, High-Performance Buildings
- Embedded Intelligence in Buildings
- Sustainable, High-Performance Infrastructure Materials
- Sustainable Manufacturing

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Disaster-Resilient Buildings, Infrastructure, and Communities

- Disaster Resilience Initiative
- Fire Risk Reduction in Communities
- Fire Risk Reduction in Buildings
- Earthquake Risk Reduction in Buildings and Infrastructure
- Structural Performance Under Multi-Hazards

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What is Disaster Resilience?

The term "resilience" means the ability to *prepare for* and *adapt to* changing conditions and *withstand* and *recover rapidly* from disruptions*

*As defined in Presidential Policy Directive 21.

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Community Needs Drive Functional Requirements for Buildings and Infrastructure

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NIST Program on Resilience for Critical Buildings and Infrastructure Lifelines

NIST will:

- Convene highly diverse stakeholder interests:
  - Develop the first version of a comprehensive Disaster Resilience Framework for achieving community resilience that considers the technical interdependence of the community's physical and human assets, operations, and policies/regulations
  - Establish a Disaster Resilience Standards Panel to further develop the Disaster Resilience Framework (version 2.0) and,
  - Develop Model Resilience Guidelines for critical buildings and infrastructure lifelines essential to community resilience based on *existing* model standards, codes, and best practices
- The Disaster Resilience Framework Version 1.0 and the formation of the Disaster Resilience Standards Panel are called out in the President's Climate Action Plan

Stakeholder Engagement is Critical

- Stakeholders include, but are not limited to:
  - Utility owners and operators
  - Emergency managers
  - Industry
  - Architects
  - Engineers
  - Regulators
  - Urban planners
  - State, local, and regional officials
  - Codes and standards organizations
  - Insurance/re-insurance industry
  - Relief organizations
  - Academia

Disaster Resilience Framework 1.0

- The Disaster Resilience Framework 1.0 will focus on the role that buildings and infrastructure lifelines play in ensuring community resilience.
- The Framework will:
  - Establish types of performance goals and ways to express them
  - Identify existing standards, codes, and best practices that address resilience
  - Identify gaps that must be addressed to enhance resilience
  - Capture regional differences in perspectives on resilience
- The Disaster Resilience Framework will be informed through a series of stakeholder workshops.

Disaster Resilience Standards Panel

- The Disaster Resilience Standards Panel (DRSP) will be modeled after the approach used for the Smart Grid Interoperability Panel
- The (DRSP) will be formed to represent:
  - The broad interests of the stakeholder community with respect to disaster resilience
  - The regional variations in perspectives on disaster resilience
- The DRSP will be:
  - open to all interested participants
  - a self-governing entity
- The DRSP will lead development of:
  - Disaster Resilience Framework 2.0
  - Model Resilience Guidelines

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Standards and Industry Organizations…

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Companies and Organizations

Smart grid utilities

SOUTHERN COMPANY
ONCOR
SDGE Sempra Energy utility
Pacific Gas and Electric Company
SOUTHERN CALIFORNIA EDISON
AEP AMERICAN ELECTRIC POWER
FPL
NSTAR
Pepco Holdings Inc
BGE We're on it.
S&C
atis
reliant. an NRG company
GeneralMicroGrids
PECO An Exelon Company
ComEd An Exelon Company
ALSTOM
nationalgrid

Associations/companies/other

SGIP
GE Energy
EEI
NRECA
EPRI ELECTRIC POWER RESEARCH INSTITUTE
AHAM
OpenSG users group
GRIDWISE Architecture Council

Additional Green Button

ACLARA
Itron
Schneider Electric
TENDRIL
eMeter
pepco
WeatherBug
SILVERSPRING
HB
Retroficiency
Snugg Home
SDGE connected Sempra Energy utility
Honeywell
lucid
TXU energy
GSA
EnergySavvy
plotwatt
FIRSTFUEL BUILDING ENERGY ANALYTICS
ORACLE

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...and Other Agencies

GSA
FCC Federal Communications Commission
NASA
DEPARTMENT OF TRANSPORTATION
DEPARTMENT OF HOMELAND SECURITY
DEPARTMENT OF DEFENSE
DEPARTMENT OF THE ARMY
DEPARTMENT OF THE AIR FORCE
DEPARTMENT OF THE TREASURY
NSF
NUCLEAR REGULATORY COMMISSION
USDA
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

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