

# NIST Visiting Committee on Advanced Technology (VCAT)

Dr. Laurie Locascio  
Under Secretary of Commerce  
for Standards and Technology  
and Director of NIST

# Meeting Agenda

**June 13, 2023**

**Session I:** NIST Programmatic Updates

**Session II:** CHIPS updates

**Session III:** Standards

**Session IV:** VCAT Progress and Planning

# Welcome New VCAT Members



**Dr. Monisha Ghosh**

Professor, Electrical Engineering  
University of Notre Dame



**Dr. Mark Pierpoint**

Senior Vice President  
Strategic Innovation & Partnerships  
Keysight Technologies, Inc.

# CHIPS R&D Office Leadership Changes **NIST**



**Dr. Lora G. Weiss**  
Director



**Dr. Eric K. Lin**  
Deputy Director



**Neil Alderoty**  
Executive Officer



**Richard-Duane  
Chambers**  
Associate Director  
for Integration and  
Policy



**Dr. Marla Dowell**  
Director of the  
CHIPS Metrology  
R&D Program

# NIST Leadership Changes



**Dr. Heather Evans**

Deputy Assistant Secretary for  
Manufacturing  
International Trade Administration



**Dr. Christopher Szakal**

Acting Director  
Program Coordination  
Office

# I. NIST Programmatic Updates

# NIST Director's Priorities





**Critical &  
Emerging  
Technology  
Leadership**

**NIST  
Community**

**Standards  
Leadership**

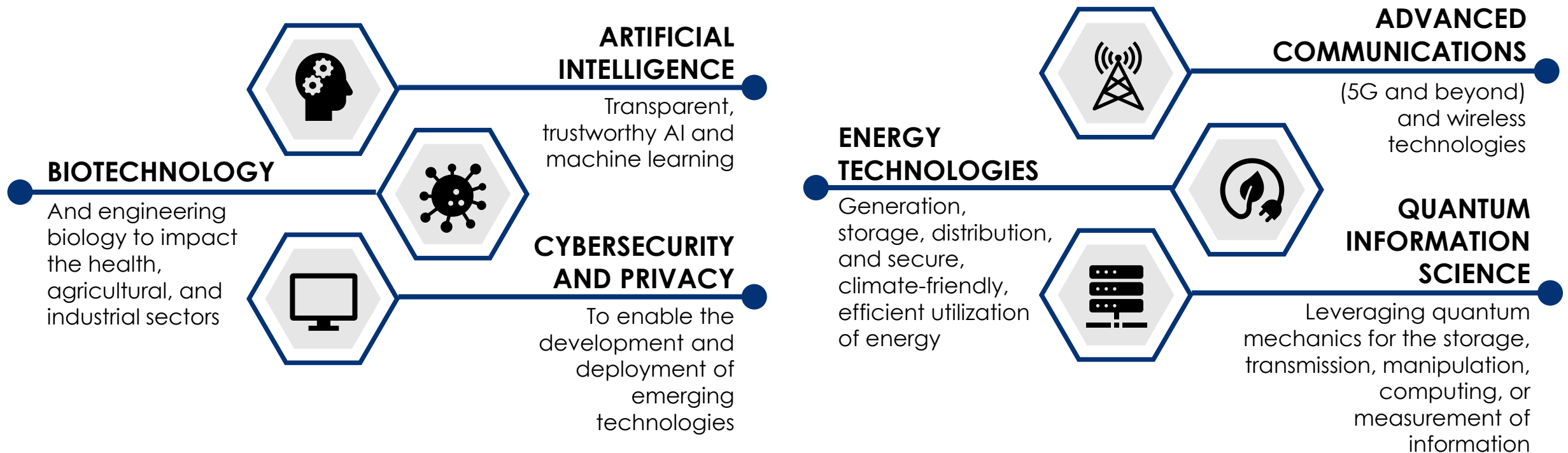
**NIST**

**Mission  
Delivery  
Enhancement**

**Manufacturing  
Leadership**



# Critical & Emerging Technologies



# Artificial Intelligence (AI) Update



## AI Research



Institute for Trustworthy  
AI in Law and Society  
(TRAILS)

National AI R&D  
Strategic Plan

## Generative AI



Upcoming Generative  
AI Working Group

Request for  
Information (RFI)  
on measurement and  
evaluation efforts

## AI Risk Management Framework



Trustworthy and  
Responsible AI  
Resource Center  
(AIRC)

## AI Standards



4<sup>th</sup> EU-US Trade and  
Technology Council  
(TTC) Ministerial in  
Luleå, Sweden

# Bioeconomy Update



Credit: NIST

## Bioeconomy E.O. Report

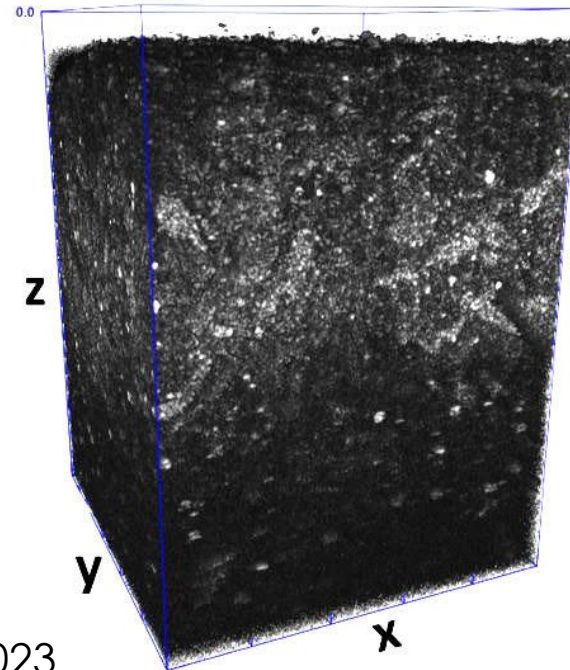
March 2023, OSTP released the NIST-authored report on biotech R&D for supply chain resilience



Report for Biotechnology and Biomanufacturing R&D to Further Societal Goals in Supply Chain Resilience

## Support of Biodefense

January 2023, NIST released a yeast material (surrogate for harmful biotreats) for training first responders on biotreats



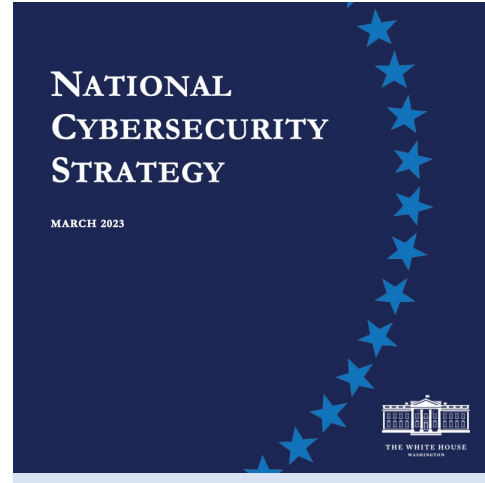
NIST and FDA scientists developed a noninvasive method to count the live cells in a three-dimensional (3D) scaffold

# Cybersecurity & Privacy Update



Credit: NIST

NCCoE Renewal  
Event March 2023



National  
Cybersecurity  
Strategy



Credit: NIST

Digital Identity  
Management



Credit: NIST

Journey to NIST's  
Cybersecurity  
Framework 2.0

**Your resource for keeping your  
small business secure.**

Get cybersecurity basics, guidance, solutions, and training to protect your information and manage your cybersecurity risks.



Credit: Wendy Szwerc

NIST's Small Business Cybersecurity Community  
of Interest

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## Summit for Democracy 2023

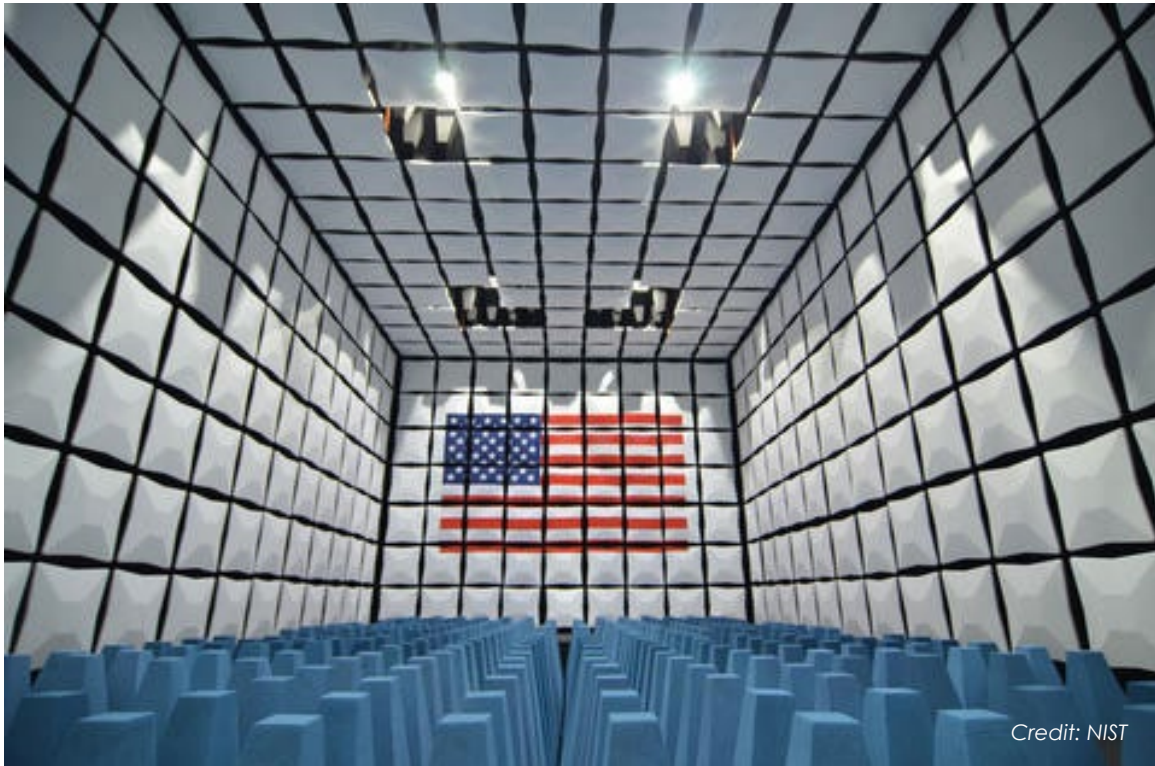
Privacy-Enhancing Technologies Prize  
Challenge Winners

# Advanced Communications Update



## NIST hosts Spectrum Strategy Workshop

Identified challenges and priorities for obtaining, disseminating, and using data about spectrum



Credit: NIST



Credit: NIST

## NIST/First Responder Network Partnership

Partnering with First Responder Network Authority to host [5x5: The Public Safety Innovation Summit](#).

# Climate and Environment Update



## Forward-Looking Building Standards

- NIST and NOAA incorporating forward-looking climate data and projections into standards for buildings and infrastructure

## Greenhouse Gas-Urban Dome

- Investigate and develop measurement tools that support independent determination of the accuracy of emissions inventory data at urban and regional scales

## Wildfires and Wildland-Urban Interface (WUI)

- NIST and CAL FIRE recently released a report to describe how far flammable structures, such as sheds, should be away from homes to limit home damage

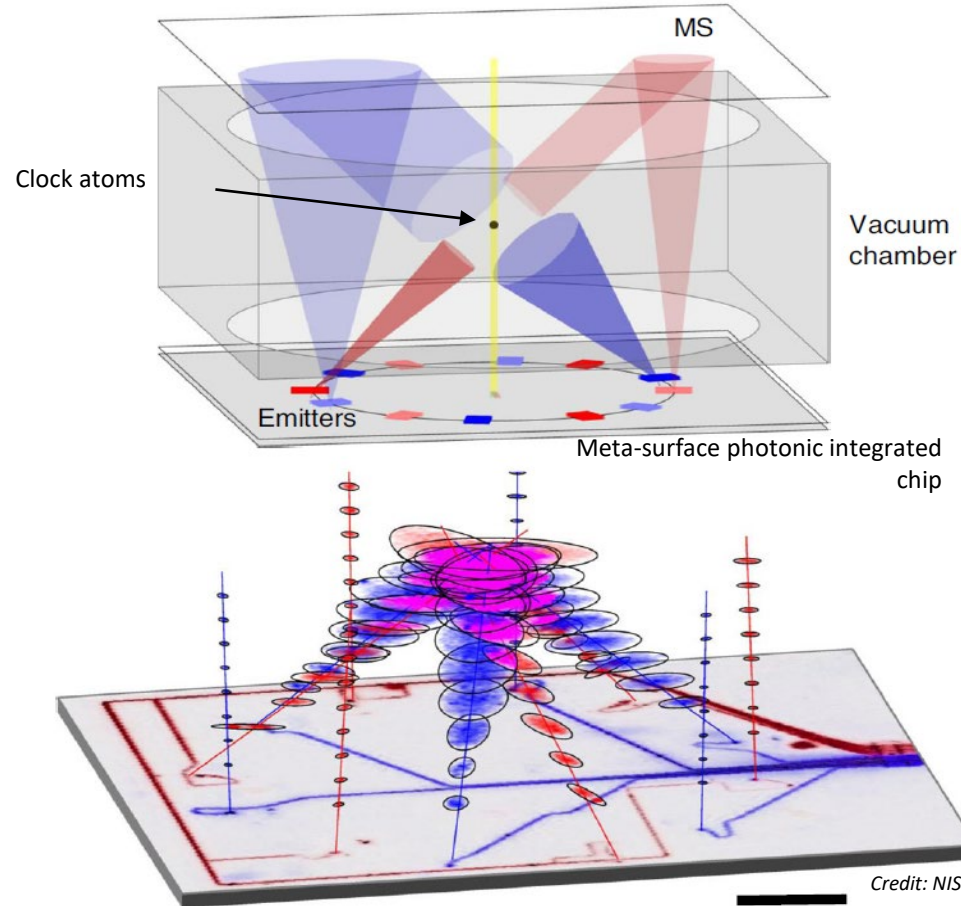
## Low Carbon Cements & Concretes Consortium

- Evaluate, develop, and standardize methods to characterize and quantify carbon and carbonates in these materials



NIST Technical Note 2253

# Quantum Information Science Update



Light: Science & Applications, April 2023

Integrated photonics and atom trapping onto a single chip for deployable optical atomic clocks and quantum-enhanced sensing.



Drs. Ana Maria Rey and Paul Julienne were elected to the National Academy of Sciences







# USG Standards Leadership Update



The U.S. Government National Standards Strategy for Critical and Emerging Technology White House Rollout event took place on May 4, 2023

## Organized by

- National Security Council
- Office of Science and Technology Policy
- U.S. Department of Commerce
- U.S. Department of State

## Panelists and experts from

- Academia
- Government
- Private sector
- American National Standards Institute (ANSI)

Focused on the U.S. government's role in bolstering private sector participation and the importance of international cooperation

# International Engagement Update



## U.S.-EU Trade and Technology Council



U.S. • European Commission

## OECD



U.S. • Australia • Austria • Canada • Denmark • Finland • France • Germany • Hungary • Japan • Korea • Mexico • Netherlands • New Zealand • Poland • Russia • Singapore • Slovak Republic • Slovenia • Sweden • Switzerland • Turkey • UAE • UK • European Commission

## Ottawa 5



Credit: ODNI

U.S. • Australia • Canada • New Zealand • UK

## Quad



Credit: White House Photo by A. Schultz

U.S. • Australia • India • Japan

## IPEF



Credit: USTR

U.S. • Australia • Brunei • India • Indonesia • Japan • Korea • Malaysia • New Zealand • Philippines • Singapore • Thailand • Vietnam

## UK DSIT Delegation Visit to DC



Department for  
Science, Innovation  
& Technology

Credit: gov.uk

U.S. • UK



Critical & Emerging Technology Leadership

Standards Leadership

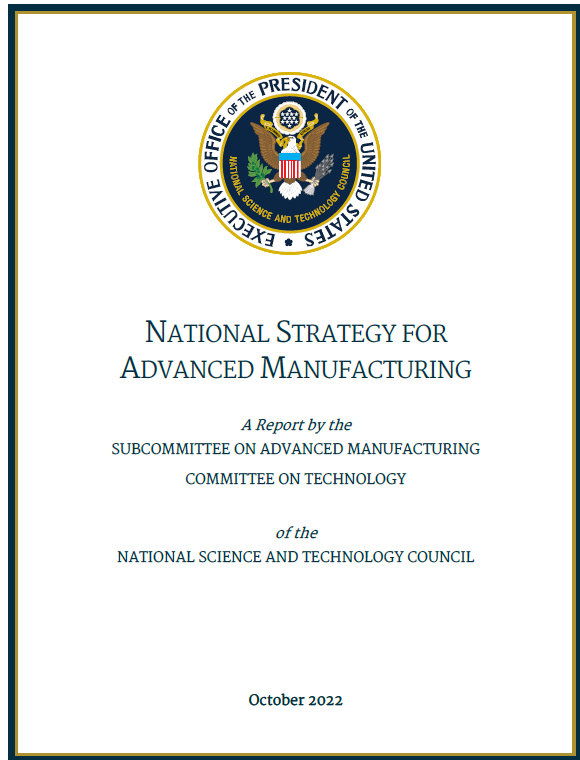
Manufacturing Leadership

Mission Delivery Enhancement

NIST Community

NIST

# MEP Update



136 STAT. 1366 PUBLIC LAW 117-167—AUG. 9, 2022

Public Law 117-167  
117th Congress  
An Act

Aug. 9, 2022 Making appropriations for Legislative Branch for the fiscal year ending September 30, 2022, and for other purposes.  
(H.R. 4344)

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. TABLE OF CONTENTS.**  
The table of contents for this Act is as follows:

Sec. 1. Table of contents.  
Sec. 2. References.

**DIVISION A—CHIPS ACT OF 2022**

Sec. 101. Short title.  
Sec. 102. Creating helpful incentives to produce semiconductors (CHIPS) for America fund.  
Sec. 103. Semiconductor incentives.  
Sec. 104. Opportunity and inclusion.  
Sec. 105. Additional GAO reporting requirements.  
Sec. 106. Appropriations for wireless supply chain innovation.  
Sec. 107. Advanced manufacturing investment credit.

**DIVISION B—RESEARCH AND INNOVATION**

Sec. 10000. Table of contents.  
Sec. 10001. Short title.  
Sec. 10002. Definitions.  
Sec. 10003. Budgetary effects.

**TITLE I—DEPARTMENT OF ENERGY SCIENCE FOR THE FUTURE**

Sec. 10101. Mission of the Office of Science.  
Sec. 10102. Basic energy sciences program.  
Sec. 10103. Biological and environmental research.  
Sec. 10104. Advanced scientific computing research program.  
Sec. 10105. Fusion energy research.  
Sec. 10106. High energy physics program.  
Sec. 10107. Nuclear physics program.  
Sec. 10108. Science laboratories infrastructure program.  
Sec. 10109. Accelerator research and development.  
Sec. 10110. Isotope research, development, and production.  
Sec. 10111. Increased collaboration with teachers and scientists.  
Sec. 10112. High intensity laser research initiative helion conservation program; Office of Science emerging biological threat preparedness research initiative; midsize instrumentation and research equipment program; authorization of appropriations.  
Sec. 10113. Established program to stimulate competitive research.  
Sec. 10114. Research security.

**TITLE II—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY FOR THE FUTURE**

Sec. 10201. Definitions.  
Subtitle A—Authorization of Appropriations  
Sec. 10211. Authorization of appropriations.

## Supply Chain Optimization and Intelligence Network (SCOIN)

- Aligns with the National Strategy for Advanced Manufacturing and MEP's strategic priorities
- \$20 million in new cooperative agreements for all 51 MEP Centers
- Under new authority granted by CHIPS Act, MEP published first Expansion Awards Pilot Program request for applications on Feb 27
- All centers submitted noncompetitive applications to implement projects that expand the existing MEP capabilities to establish SCOIN

# Manufacturing USA Update



## FY 2023 Enacted Appropriations

FY23 Base appropriations  
**\$37M**

- Ongoing support of NIST-sponsored NIIMBL
- New flexible-topic NIST-sponsored MFG USA institute competition

FY23 Special appropriations  
**\$14M**

- Funding to address news responsibilities under the Research and Innovation (“Science”) Division of CHIPS & Science Act

CHIPS appropriations

- Up to 3 NIST-sponsored MFG USA semiconductor institutes
- Funding for existing institutes for tech and training integrated with NSTC

## Manufacturing USA 2023 Network Meeting



Credit: Manufacturing USA

Anticipated ‘WEAVE’ Public Service Awards  
**\$11M**

- Engaging HBCUs, MSIs
- Transitioning institute-developed technologies



**NIST**

Critical & Emerging Technology Leadership

Standards Leadership

Manufacturing Leadership

Mission Delivery Enhancement

NIST Community

# NIST Measurement Services

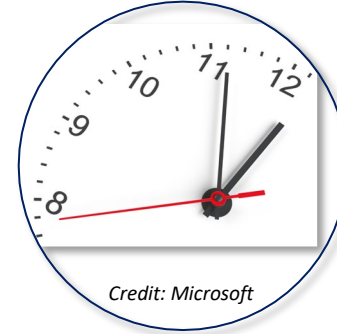


## Every Year

- 14,000+ calibrations
- 32,000+ SRMs sold
- 800+ accreditations of testing and calibrations labs



5G Antenna calibrations



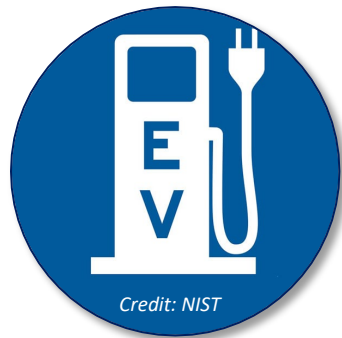
100 billion requests daily to Internet Time Service



1100+ Standard Reference Materials



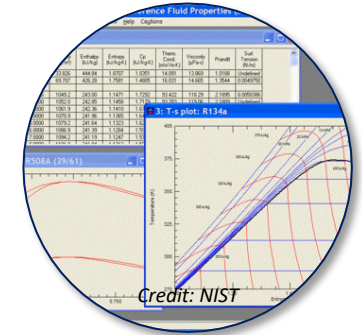
Quantum detector efficiency calibrations



Developing: EV supply equipment services



in vivo MRI Biomarker traceability msmts.



100+ Standard Ref. Data Products

# Fighting the Opioid Epidemic



## Influx of Xylazine, an animal tranquilizer into the illegal drug market in Maryland

- Found in 80% of fentanyl samples
- Causes injection site wounds that can lead to amputation



Results shared within 48 hrs. to inform on substances in circulation

## NIST developed a safe analytical platform for rapid non-targeted drug analysis with the sensitivity to detect fentanyl analogues

Unique compounds identified	77
First identified in Maryland	7
First identified nationally	2

TRANQ Research Act (H.R. 1734): Requires NIST to support research identifying xylazine, novel synthetic opioids, and other emerging substances of concern; *passed House*



# PFAS Prevalence in Firefighter Gear

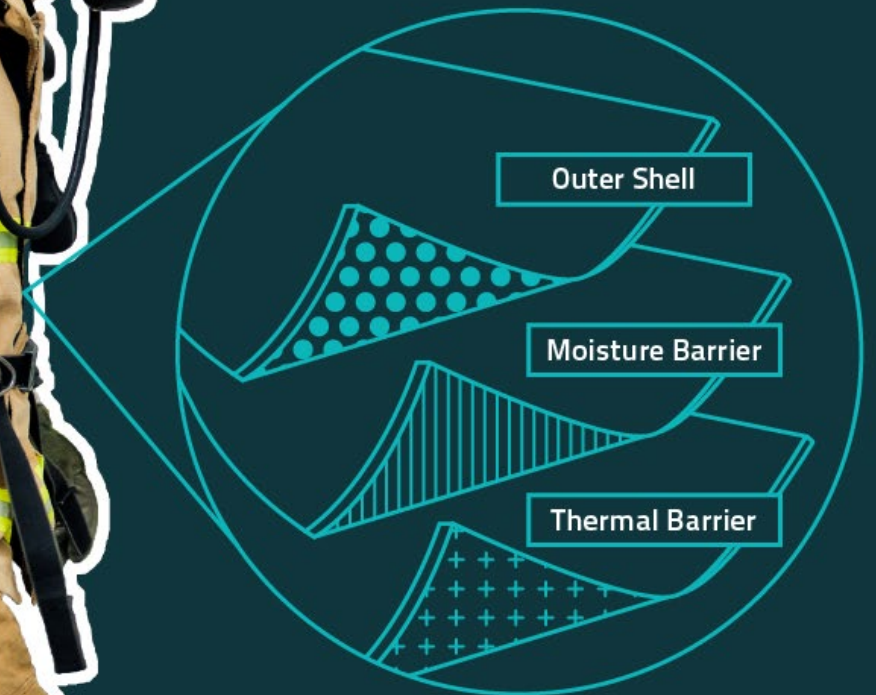


- Per- and polyfluoroalkyl substances (PFAS) are manufactured “forever” toxic to humans and wildlife
- NIST examined range of textiles used in turnout gear coats and pants to identify PFAS types, quantity, location
  - Recent report: highest concentrations in outermost layers
- NIST is completing a similar study of PFAS in new and stressed hoods, gloves and wildland gear

Congressional interest in other exposures  
- SRMs for drinking water, food, and house dust



## PFAS Variance Analysis



# NIST Disaster Investigations Update



Credit: NIST

## Hurricane Maria/Fiona

- Evaluate performance of critical buildings and emergency communications; recovery of infrastructure systems, businesses, supply chains, and social functions

## Hurricane Ian

- Assess relationships between wind speed and building codes to determine benefit-cost analysis for adoption of modern wind provisions
- Study emergency communications and evacuation actions taken during the event

## Champlain Towers South

- May 2023: Move into second warehouse enables new phase of testing
- May-Fall 2023: Begin invasive testing of evidentiary debris
- **June 14-15: NCST Advisory Committee meeting**

# NCNR Update



Credit: NIST

## Reactor Status

- NRC authorized reactor restart: March 10, 2023
- Initial operations at low power: March 16, 2023
- Low power testing at 1 MW in progress; Reactor Operator Exams in July
- Engineering solutions planned this summer to mitigate radioactivity in the primary system

## NCNR Meeting

- June 20: NRC Commission “Briefing on Results of the Agency Action Review Meeting”
  - Discussion on NIST performance improvement activities

## NCNR Leadership

- Dr. Dan Neumann appointed Associate Director, oversees new neutron source study
- Dr. Ron Jones appointed Leader, Neutron Condensed Matter Science Group



Morning/Afternoon Sessions

Thank you!