NIST Visiting Committee on Advanced Technology (VCAT)

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

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

February 14, 2024

Meeting Agenda

February 14, 2024

Session I: Programmatic Updates: NIST Director's Overview and Safety

Session II: Programmatic and Operational Updates: DEIA and CHIPS R&D

Session III: Subcommittee on US International Standards Development Activity

Session IV: Working Session

NIST Leadership Changes

Credit: NIST

Mr. Kevin Stine

Director, Information Technology Laboratory

DOC Pending

Credit: NIST

Ms. Bethany Loftin

Director, Technology Partnerships Office

DOC Pending

Credit: NIST

Dr. Melissa Midzor

Acting Director, Communication Technology Laboratory

U.S. AI Safety Institute

Credit: Linkedin

Ms. Elizabeth Kelly

Executive Director

Credit: NIST

Ms. Elham Tabassi

Chief Technology Officer

Thank You

Credit: NIST

Ms. Katharine Ku

Chief Licensing Advisor

Wilson, Sonsini, Goodrich and Rosati

Credit: NIST

Dr. Dana "Keoki" Jackson

Senior Vice President and General Manager,

MITRE National Security Sector
MITRE Corporation

Credit: NIST

Mr. George Fischer

Senior Vice President

T-Mobile for Business and Head of Business Sales

Refined VCAT Expectations

- **VCAT members are expected and strongly encouraged to attend all three scheduled meetings each year**
  - Piloting two single-day virtual meetings, one two-day, in-person meeting each year
  - Dates of upcoming meetings through 2026 on the VCAT website

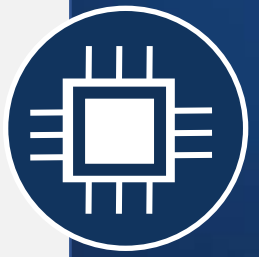
- **VCAT members, NIST senior leadership, and guest presenters are expected to engage in active discussion** so that NIST can receive advice and guidance to continue to meet our mission

Credit: Pixebay

I. NIST Programmatic Updates

Updates

Artificial Intelligence



CHIPS PMT Announcements

Selected NIST Highlights

Executive Order 14110

The President's Executive Order (E.O.) on Safe, Secure, and Trustworthy Artificial Intelligence (14110) directs NIST to:

Create Guidance	• Generative AI and dual-use foundation models • Differential-privacy guarantee protections • Red-teaming/testing • Authenticity and provenance of synthetic content
Develop Evaluation & Testing	• Test environments for evaluating AI capabilities, including those that could cause harm • Availability of testbeds supporting the development of safe, secure, and trustworthy AI technologies
Engage with Stakeholders & Develop Standards	• Global engagement on AI standards • Synthetic nucleic acid synthesis providers engagement • Minimum risk-management practices

NIST's Progress on E.O. Assignments

Credit: Gerd Altmann from Pixabay

- Request for Information (RFI) to inform NIST's assignments
- Draft Guidelines for Evaluating Differential Privacy
- Secure Software Development Framework Workshop
- Pre-release testing of NIST's Dioptra infrastructure

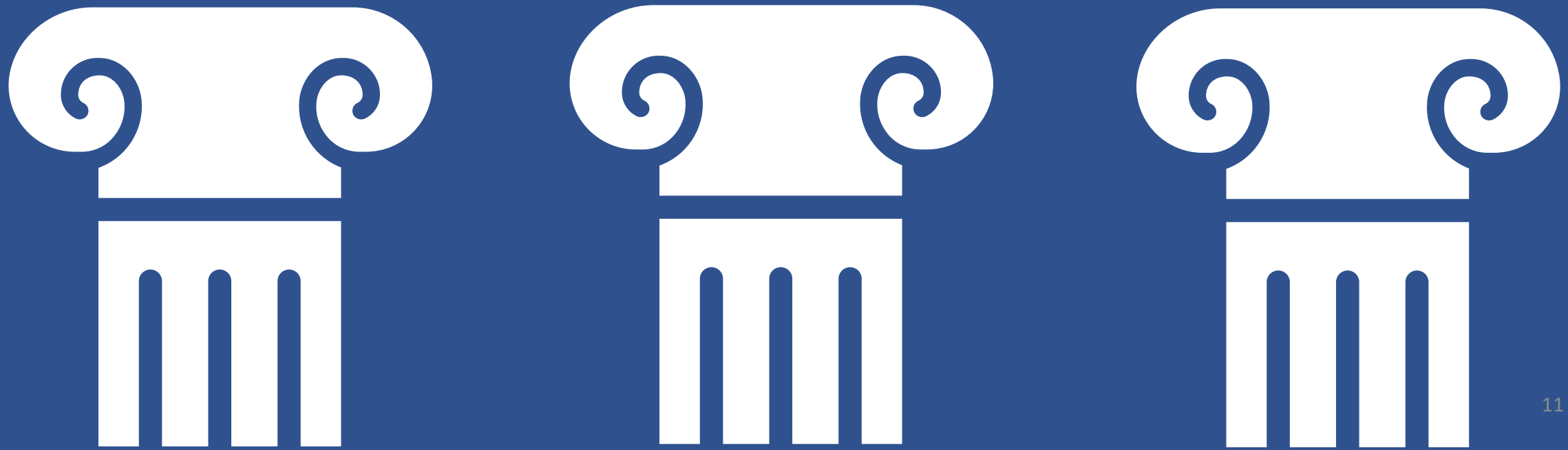
United States AI Safety Institute (USAISI)

The USAISI's primary mission is to build the science necessary for safe development and use of trustworthy AI.

Research

Implementation

Engagement & Operations



USAISI Consortium

November 2023: Release of Federal Register Notice (FRN) asking for letters of interest– over 600 received!

February 2024: Official launch of Consortium with inaugural cohort of more than 200 member companies

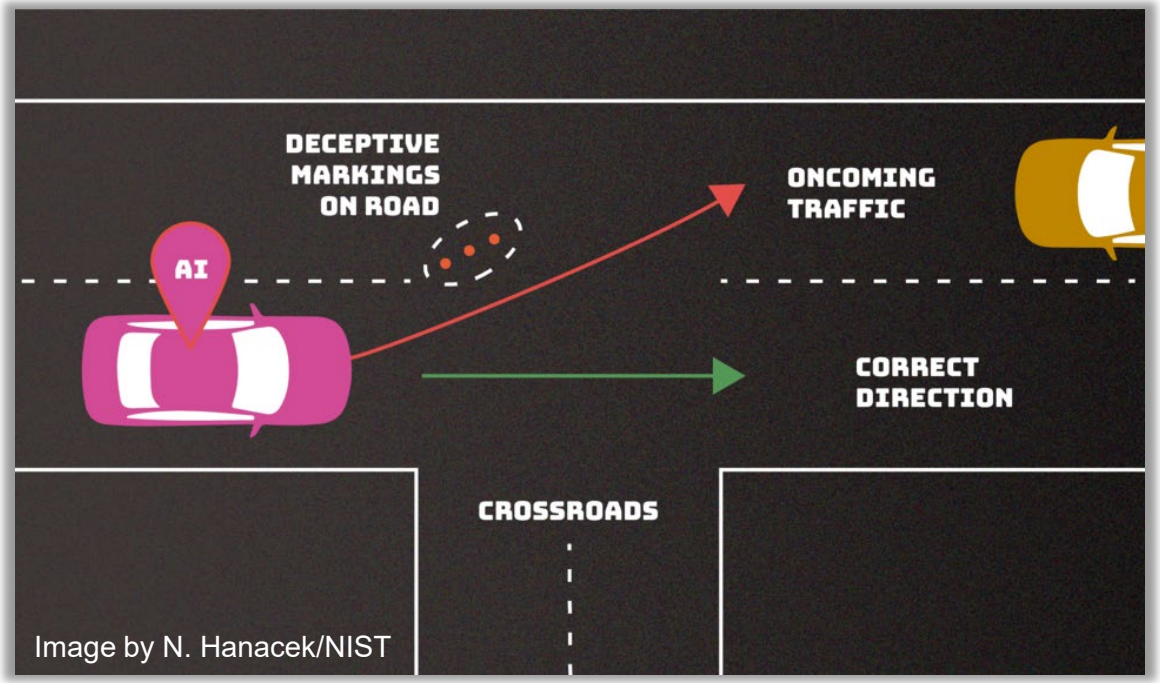
February 2024: Begin working partners in five working groups

Credit: NIST

NIST AI Program Updates

Adversarial Machine Learning Taxonomy and Terminology Report

- Identifies vulnerabilities of machine learning and AI
- Establishes common language for understanding threats and mitigation methods



NATIONAL AI ADVISORY COMMITTEE

Image by naiac.gov

NAIAC

- 4 Public Meetings
- 4 recommendation reports
- 2 non-decisional documents

What's Next for NIST?

Credit: Gerd Altmann from Pixabay

AI E.O. Deliverables

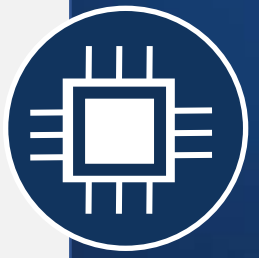
- Report on synthetic content
- Guidelines for red-teaming
- Generative AI companion resource
- Pilot program for test evaluations

USAISI

- Develop Consortium work plans
- Nationwide workshops in support of working group activities

Updates

Artificial Intelligence

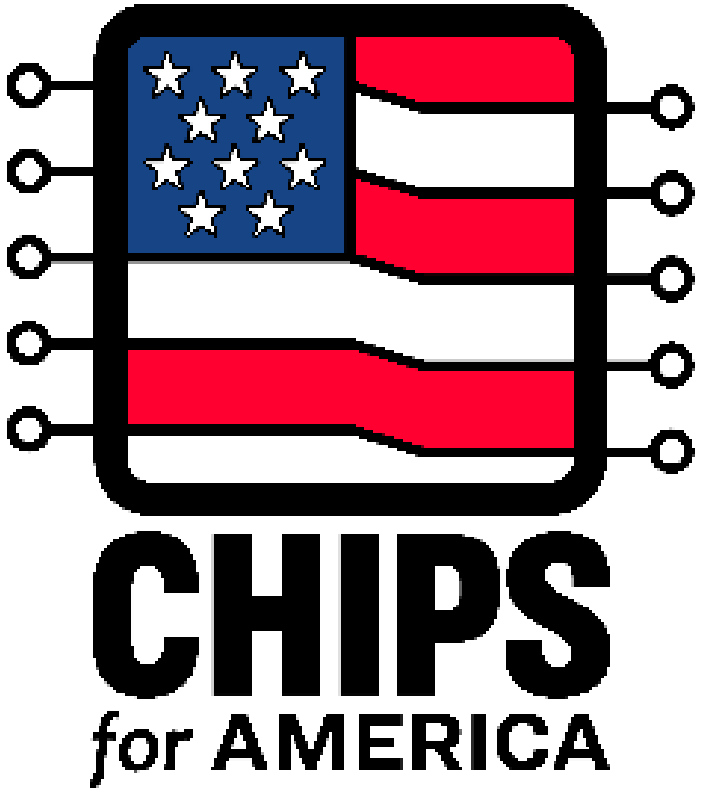


CHIPS PMT Announcements

Selected NIST Highlights

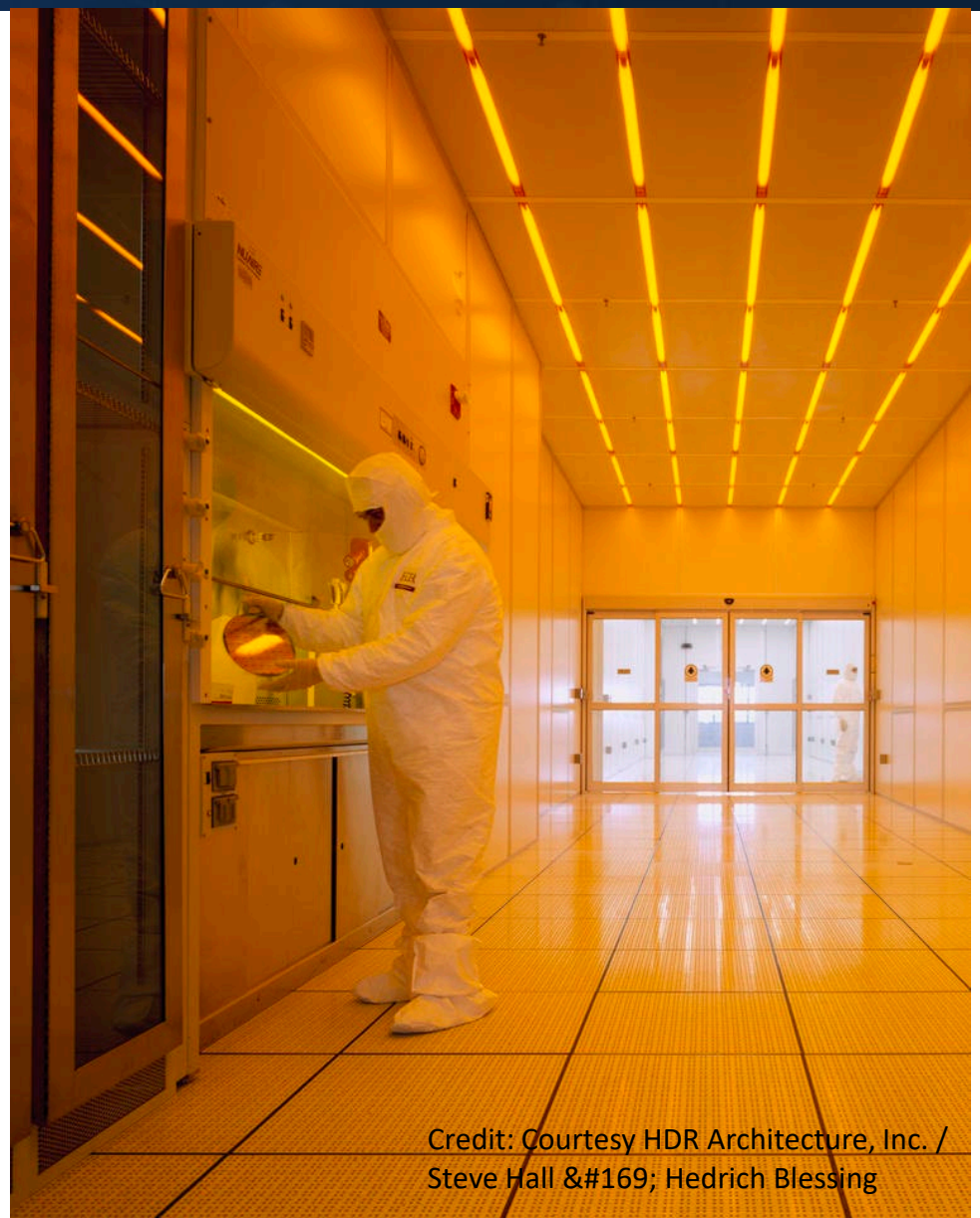
CHIPS PMTs

- **Preliminary memorandum of terms (PMT) reached with BAE Systems Electronic Systems**
  - $35 million in federal incentives
  - Support modernization of Microelectronics Center in Nashua, NH
  - Quadruples the production of chips necessary for critical defense programs including the F-35 fighter jet program



CHIPS PMTs

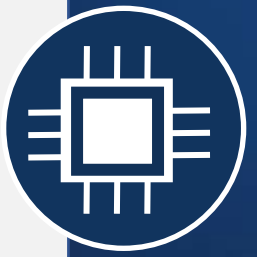
- **Preliminary memorandum of terms (PMT) reached with Microchip Technology Inc.**
  - $162 million in federal incentives
  - Modernize and expand facilities in Colorado Springs, CO, and Gresham, OR
  - Significantly increases U.S. production of semiconductors critical to America's automotive, commercial, industrial, defense, and aerospace industries



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

Updates

Artificial Intelligence



CHIPS PMT Announcements

Selected NIST Highlights

Creating Trust in Digital Technologies NIST

NIST INFORMATION TECHNOLOGY LABORATORY

NIST Manufacturing USA®

NIST MANUFACTURING EXTENSION PARTNERSHIP

NIST CYBERSECURITY FOR IOT PROGRAM

Coming Soon in 2024

- Cybersecurity Framework 2.0 release
- Post-Quantum Cryptography Standards

Recent Highlights

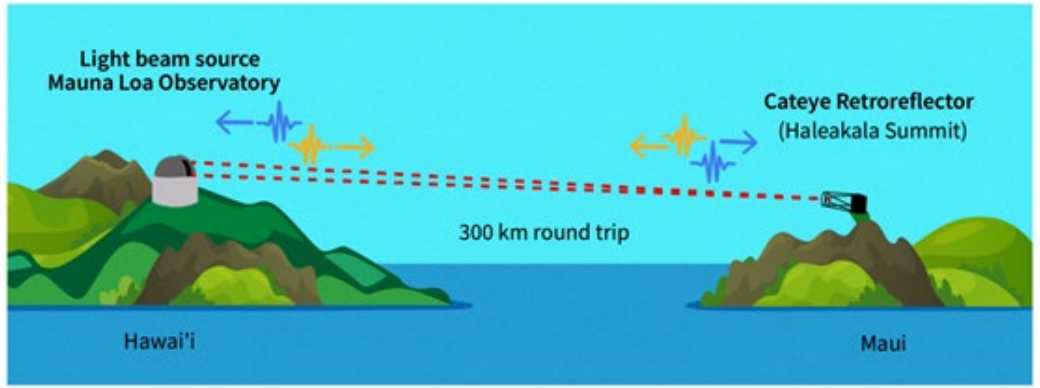
- MEP and MxD Collaboration
- Cybersecurity Profile for Consumer Grade Routers December Forum

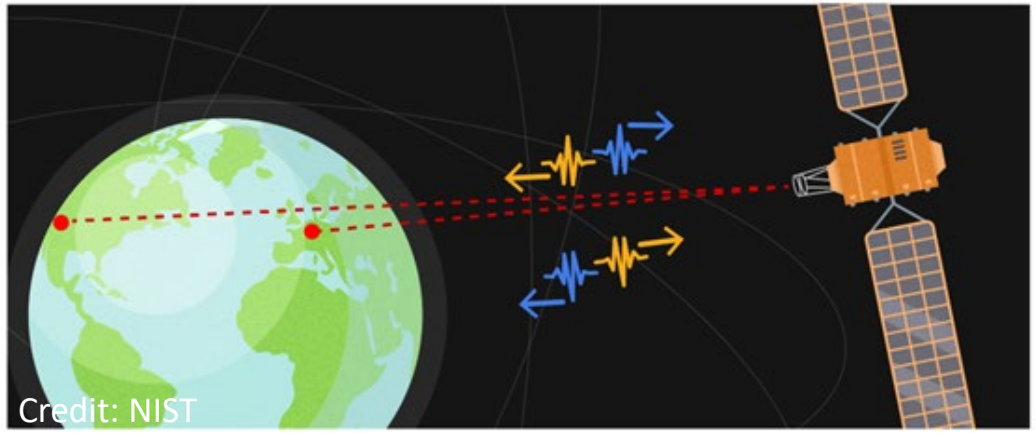
Advanced Communications

National Spectrum Strategy

Next G Wireless Gaps Report

Time Transfer

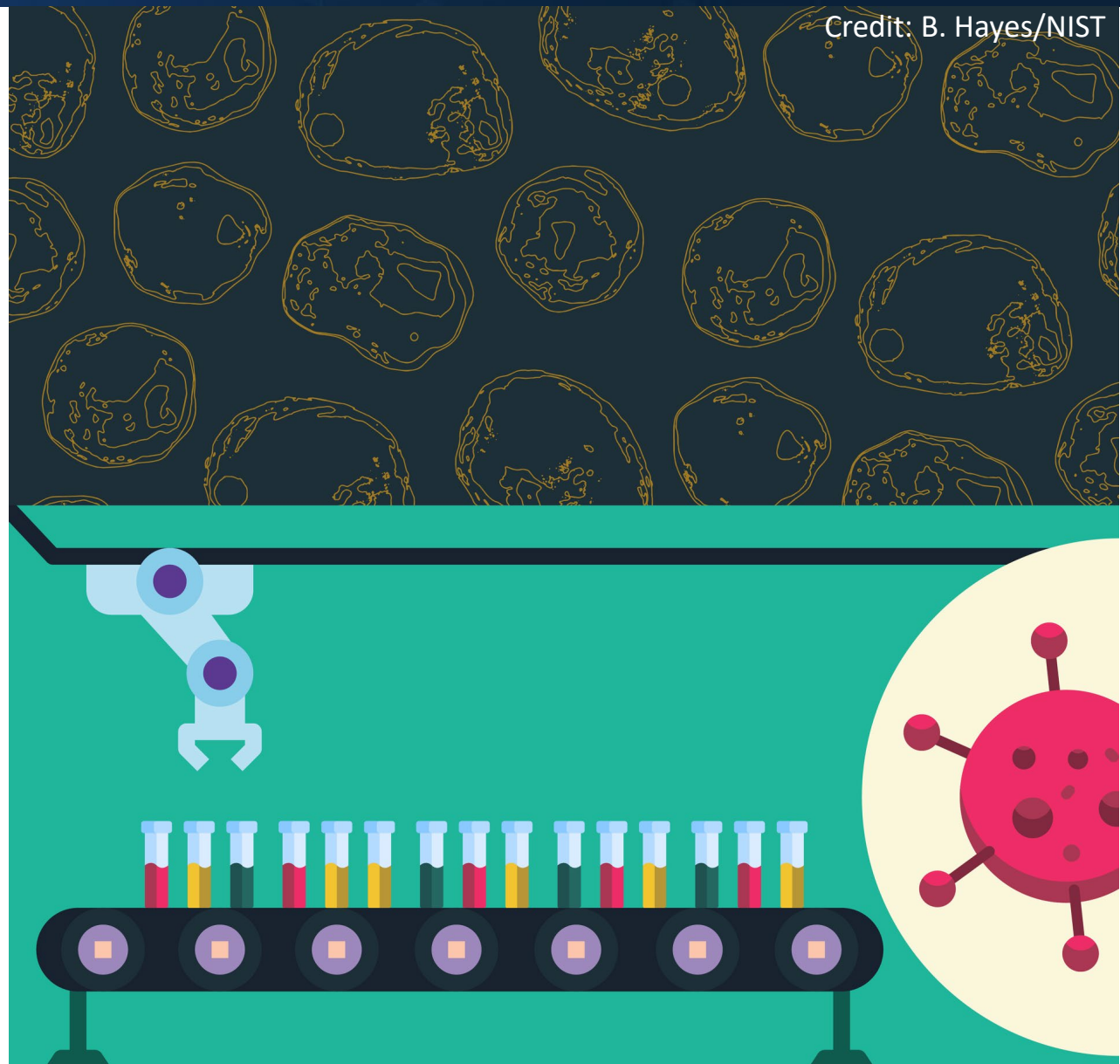




Precision timing at the quantum limit

Biotechnology

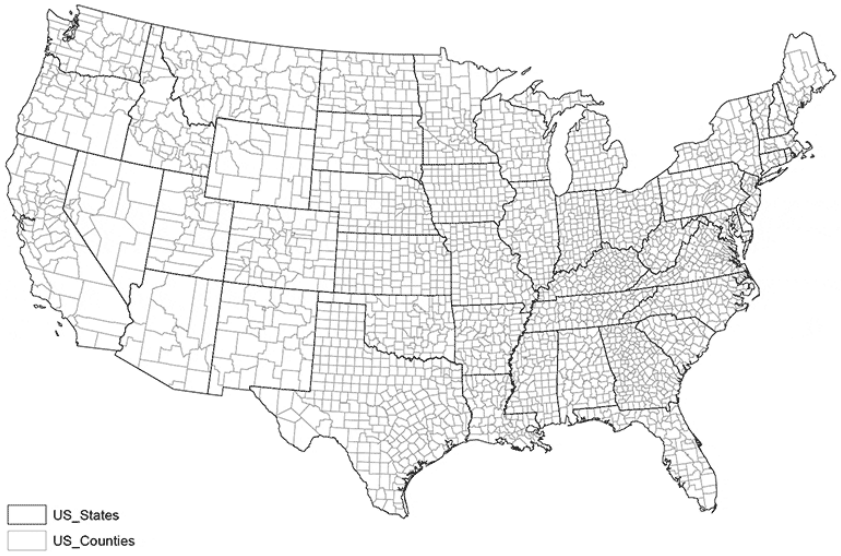
- DOC Ron Brown Award
  - For Serial Cytometry
    - Greg Cooksey
    - Mathew DiSalvo
    - Anthony Kearsley
    - Paul Patrone
- NIST-FDA workshop
  - Measurements and Standards for Advanced Therapy



Climate

NIST's multidisciplinary research continues to address climate change in impactful ways

Tornado-resistant design provisions incorporated into the 2024 International Building Code

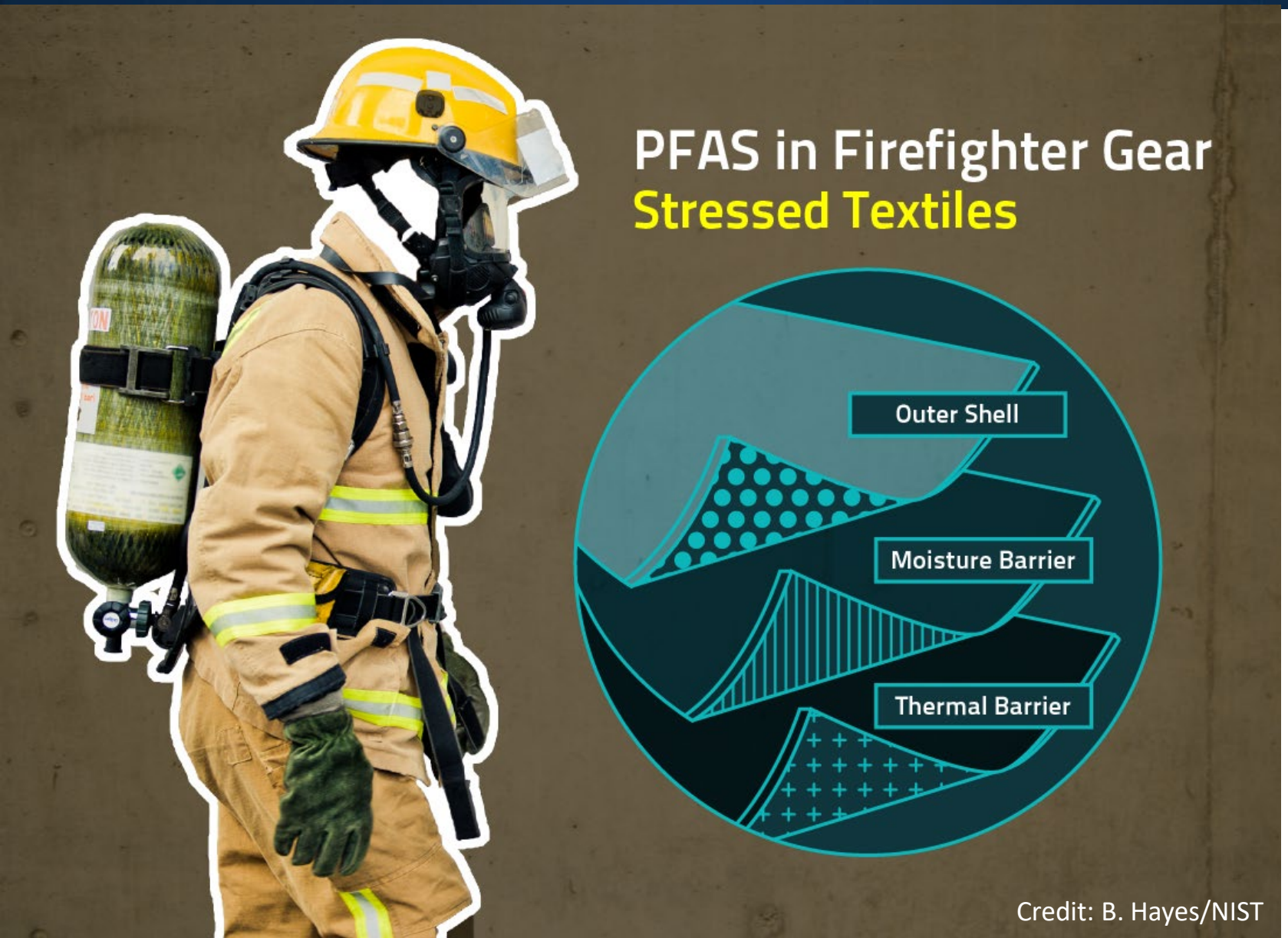


Credit: B. Hayes/NIST

Upgraded Frequency Combs to monitor methane even in harsh field conditions

Credit: K. Cossel/NIST

Contaminants of Concern



Credit: B. Hayes/NIST

Major Reports Released

- Report to Congress on PFAS in Firefighter Gear
- National Emerging Contaminants Research Initiative (NECRI) Implementation Plan
  - Drinking water contamination

National Emerging Contaminants Research Initiative Implementation Plan

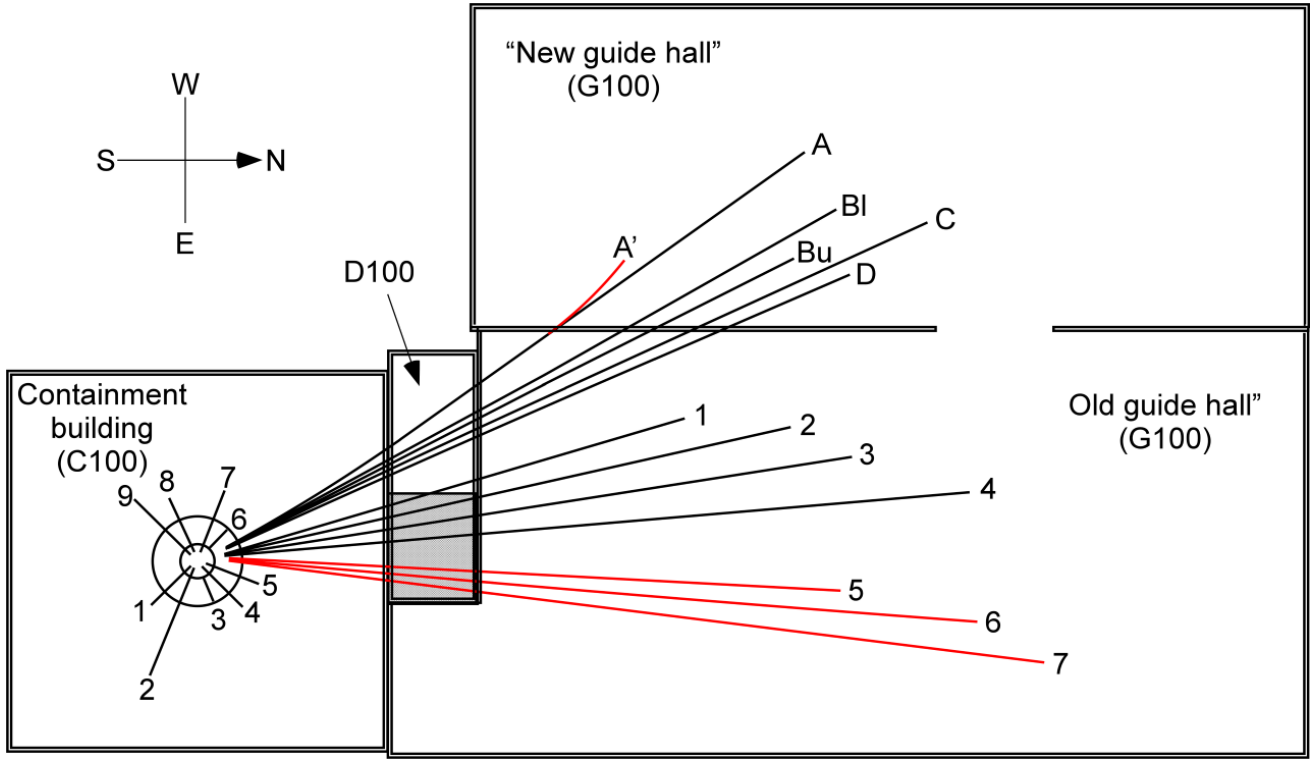
NCNR Update

Reactor Status

- Despite extensive clean-up efforts, ≈ 1 gm of fissionable material remains near the core
- Plan developed to clean reactor internals further
  - Underwater power washing: summer and fall of 2024
- Conduct reactor operations post-cleaning

Neutron Guide Upgrade

- Replace neutron guides 5, 6, & 7 (red) in 2024
  - Improve performance of nine instruments from 1.5x to 10x

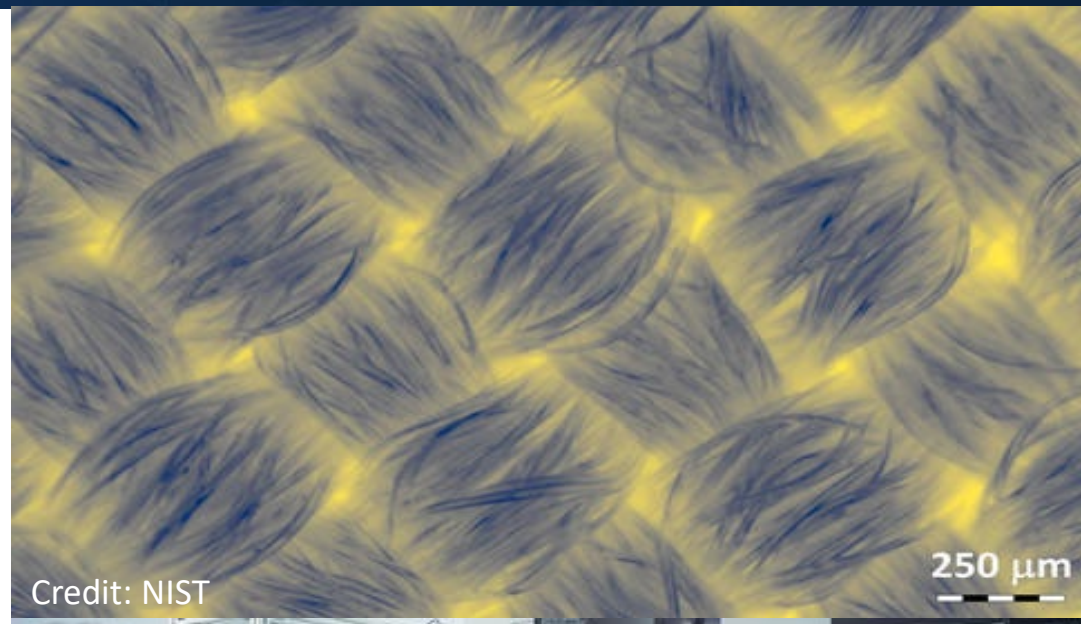


New Neutron Source Workshop

- "Neutrons for the Future" held Oct. 2023
  - 200+ scientists from across the U.S.
  - Final report in preparation

Select Public Engagements

- **Small Business Innovation Research (SBIR) Program**
  - Awarded nearly $3 million to 15 small businesses in 9 states
  - Supports R&D and commercialization projects
- **Curricula Development Cooperative Agreement Program**
  - Awarded $1.1 M to 8 universities to support standards education in undergraduate, graduate curricula
  - Supported by the Standards Coordination Office
- **Baldrige Reimagined**



Credit: NIST

Credit: Gorodenkoff/Shutterstock

NIST Community

New Telework Guidance Effective 1/1/24

- Designated Tuesdays and Thursdays as NIST Community Days
- Clarified eligibility for up to 2 or 4 days of telework per week based on position duties
- Clarified situations where remote work can be authorized as a strategic management tool

Thank you!