

NIST Visiting Committee on Advanced Technology (VCAT)

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

Meeting Agenda

February 8, 2023

Session I: Programmatic & Operational Updates

Session II: NIST Safety Committee Update

Session III: Findings of the National Academies of Science, Engineering and Medicine Assessment of NIST Facilities

Session IV: CHIPS Updates

Session V: NIST Community Building Efforts

Session VI: Subcommittee Recommendations

February 9, 2023

Session VII: VCAT Annual Report Drafting Session

I. Programmatic Updates –
continued progress
on our priorities

Grateful Recognition



Dr. Robert M. Dimeo

Director, NIST Center for
Neutron Research

Departing NIST March 2023



Dr. James M. Adams

Special Advisor for Nuclear
Operations (detailed)

Acting NCNR Director
(transition in March)

NIST Leadership Changes



Dr. James Olthoff
NIST Chief Metrologist
Director's Office

NIST Leadership Changes



Dr. Charles H. Romine

Associate Director for
Laboratory Programs
(transition in late Feb)



Mr. James A. St Pierre

Acting Director, Information
Technology Laboratory
(transition in late Feb)

NIST Leadership Changes



Dr. Marla L. Dowell

Metrology Program Director,
CHIPS R&D

Boulder Site Director
(transition soon)



Mr. Dereck Orr

Acting Director,
Communications Technology
Laboratory
(transition soon)

NIST Director's Priorities





**Critical &
Emerging
Technology
Leadership**

**NIST
Community**

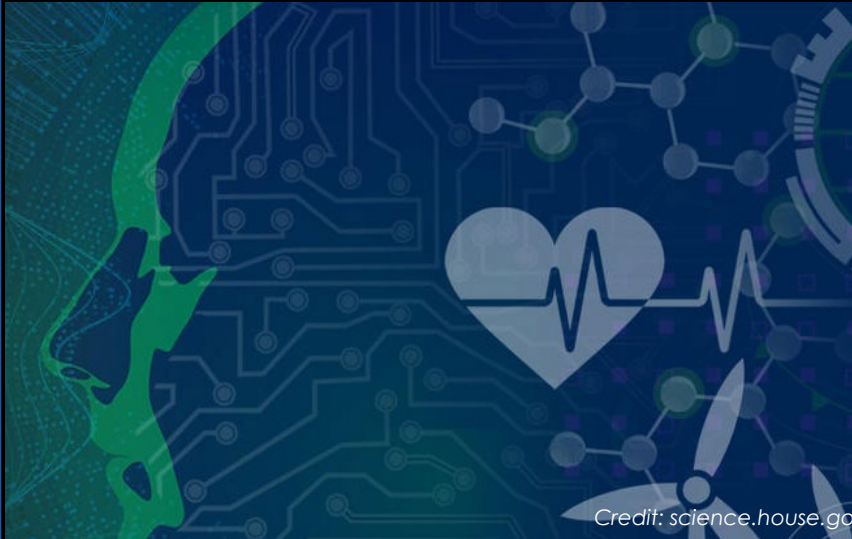
**Standards
Leadership**

NIST

**Mission
Delivery
Enhancement**

**Manufacturing
Leadership**

Artificial Intelligence (AI) Update



Credit: science.house.gov

Rollout of the NIST AI Risk Management Framework (AI RMF) 1.0 & AI RMF Playbook 1.0

In-person launch with Deputy Secretary Graves and Federal, industry leaders

January 26, 2023



Credit: @SecRaimondo

3rd U.S./EU Trade & Technology Council (TTC) ministerial at Univ. of Maryland College Park

Joint Roadmap on Evaluation and Measurement Tools for Trustworthy AI and Risk Management

December 5, 2022

Working on the global scale to promote trustworthy AI

Cybersecurity & Privacy Update



Cybersecurity Framework 2.0

NIST CSF 2.0 Concept Paper: Potential Significant Updates to the Cybersecurity Framework

- Released for public comment, 1/19/22
- Public workshops on 2/15/23 (virtual) and 2/22-23/23 (in-person)
- Comments due by 3/3/23

Creating the tools for the world to use to promote secure and trusted digital access

Advanced Communications Update



NIST Joins O-RAN Alliance (Nov. 2022)

Global consortium of carriers, vendors, and research institutions working to standardize the parts of the RAN and the interfaces that connect them

Collaboration Between NIST & AIM Photonics (Dec. 2022)



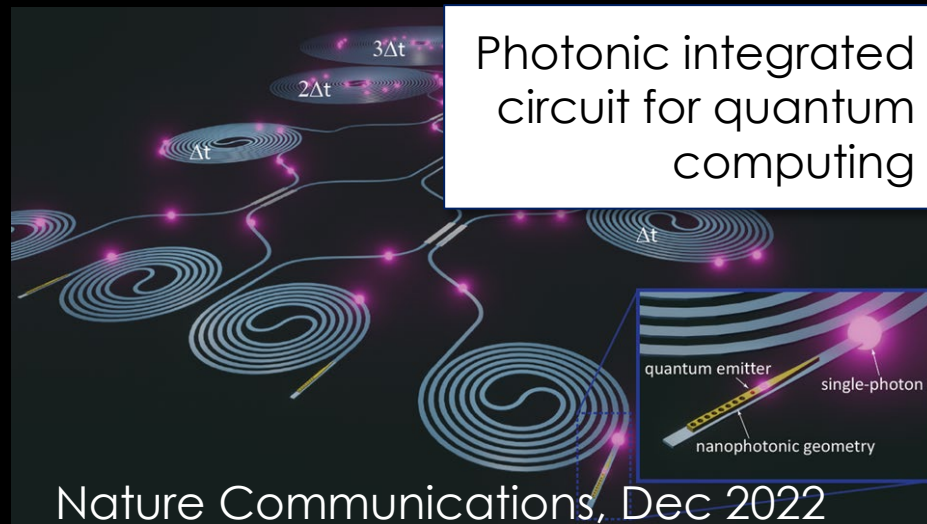
- AIM Photonics focus on manufacturing photonic chips
- NIST will design “calibration structures” to measure and test the performance of photonic chips at speed of up to 110 GHz

Advancing the next generation of wireless technologies

Quantum Information Sciences Update



Photonic integrated circuit for quantum computing



Nature Communications, Dec 2022

nature

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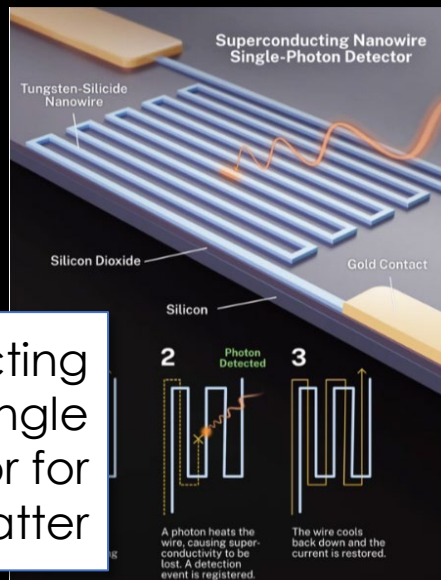
Article | [Published: 05 October 2022](#)

The time-programmable frequency comb and its use in quantum-limited ranging

[Emily D. Caldwell](#), [Laura C. Sinclair](#) , [Nathan R. Newbury](#)  & [Jean-Daniel Deschênes](#)

[Nature](#) **610**, 667–673 (2022) | [Cite this article](#)

Superconducting nanowire single photon detector for dark matter



Phys. Rev. D Dec 2022

Shaping the quantum future

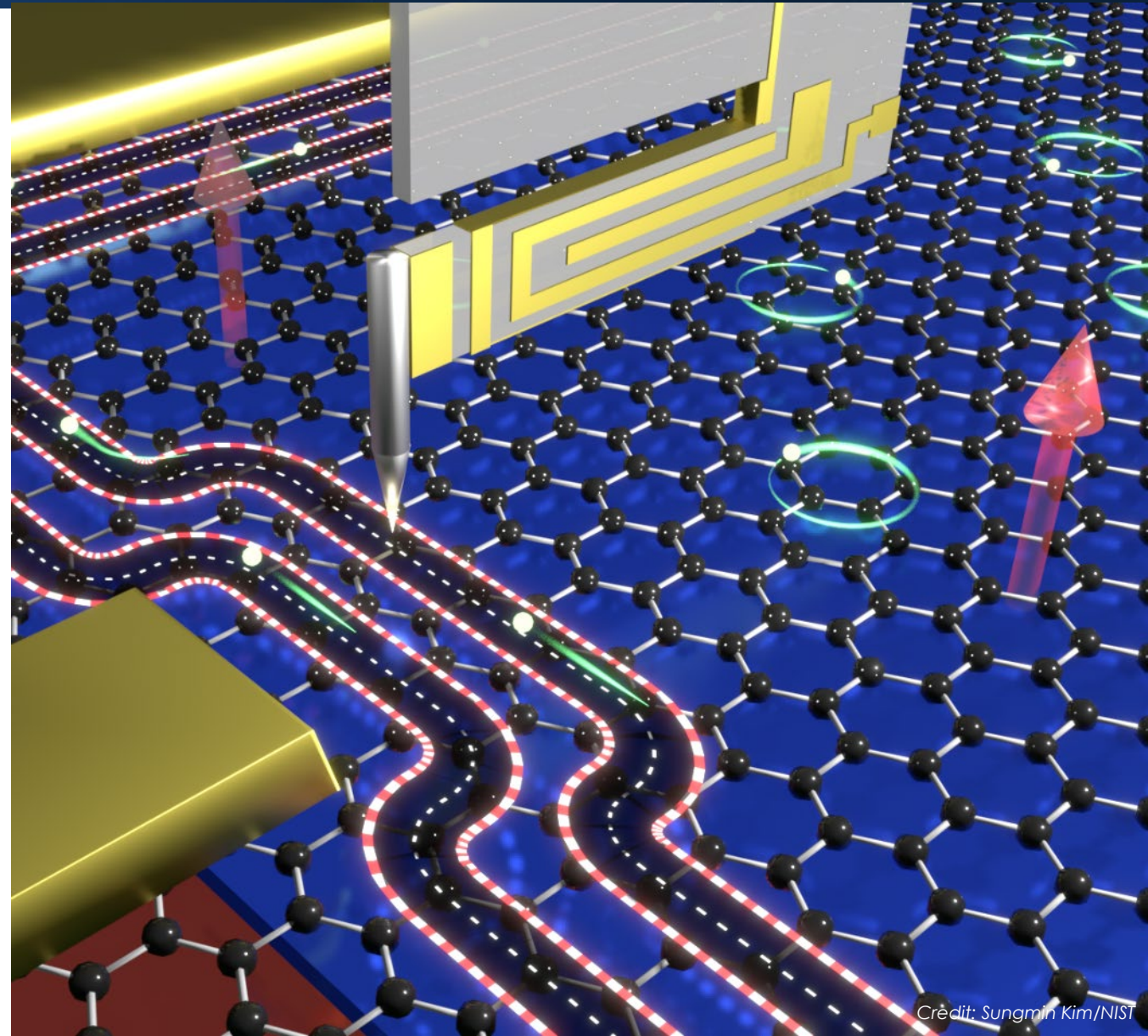
NIST and Post-Quantum Cryptography



4th NIST PQC Standardization Conference

November 29 - December 1, 2022

- Introduced technical specifics for upcoming standards and received feedback from stakeholders
- Drafts of standards anticipated in summer 2023



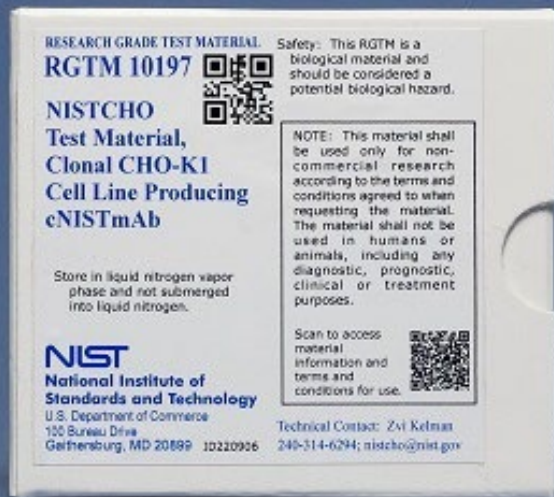
USE



SEPTEMBER 12, 2022

Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy

Promoting innovation in
biomanufacturing and accuracy and
precision in biological measurements



Credit: NIST

Energy, Climate, Environment



FY2023 Appropriations (+\$11.5M)

- Climate and Energy Measurement, Tools, and Testbeds
- Direct Air Capture and Carbon Dioxide Removal and Sequestration
- Center of Excellence in Climate Change Measurement
- Forward-Looking Building Standards
- GHG-Urban Dome
- Wildfires and the Wildland-Urban Interface

July 2022 launch of novel NASA instrument sets sights on Earth-bound solar radiation

Technology Transfer Activities



	FY22
Invention Disclosure	69
Provisional Applications	59
Non-Provisional Applications	27
Patents Issued	25
New Licenses	12
Active Licenses	63

Exclusive License to Wavens

- US Patent Application 16/418,202, “Mapping probe for real-time signal sampling and recovery from engineering electromagnetic interference”
- Mapping probe can create a map of a structural entity, e.g., a three-dimensional (3D) environment such as a room, a building, a city, etc.
- The final product will function like a camera that can see through walls.

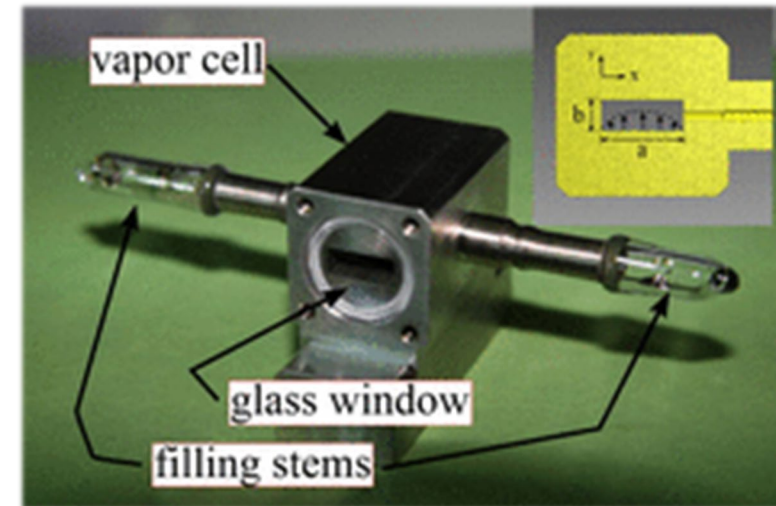
(12) **United States Patent**
Holloway et al.

(10) Patent No.: **US 11,435,386 B2**
(45) Date of Patent: **Sep. 6, 2022**

(54) SI-TRACEABLE RYDBERG ATOM
RADIOFREQUENCY POWER METER AND
DETERMINING POWER OF RADIO
FREQUENCY RADIATION

(58) Field of Classification Search
CPC . G01R 29/0885; G01R 29/0892; G01R 21/01
(Continued)

(56) References Cited



(12) **United States Patent**
Bharti et al.

(10) Patent No.: **US 11,531,844 B2**
(45) Date of Patent: **Dec. 20, 2022**

(54) USING MACHINE LEARNING AND/OR
NEURAL NETWORKS TO VALIDATE STEM
CELLS AND THEIR DERIVATIVES (2-D
CELLS AND 3-D TISSUES) FOR USE IN
CELL THERAPY AND TISSUE ENGINEERED
PRODUCTS

(51) Int. Cl.
G06K 9/00 (2022.01)
G06K 9/62 (2022.01)
(Continued)
(52) U.S. Cl.
CPC *G06K 9/6257* (2013.01); *G06T 7/0012*
(2013.01); *G06V 20/69* (2022.01);



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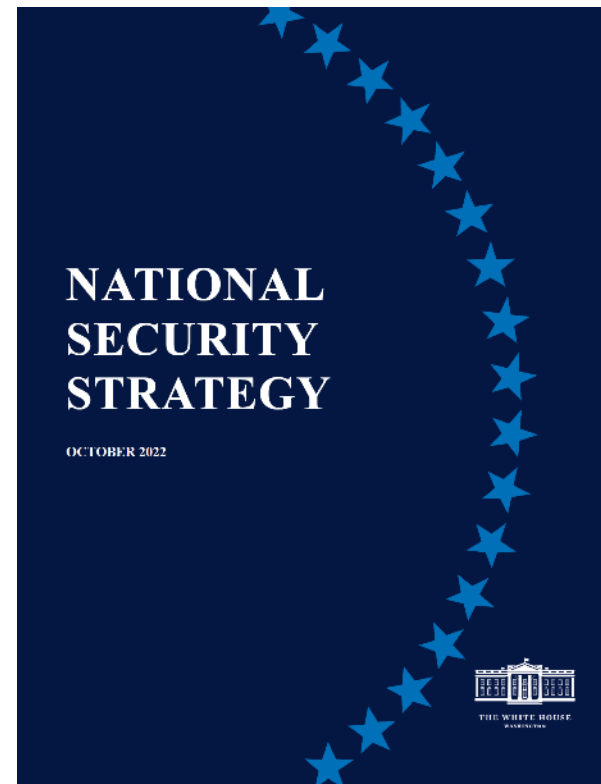
Mission
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USG Standards Leadership



- NIST is working closely with the administration on developing a strategic approach to public-private cooperation in U.S. international standards development activity
- NIST will lead the interagency implementation plan
- Stakeholder “listening sessions” to be announced soon



*“To ensure these investments support positive technological outcomes, we will partner with industry and governments in **shaping technological standards** that ensure quality, consumer safety, and global interoperability, and to advance the open and transparent standards process that has enabled innovation, growth, and interconnectivity for decades.”*

International Engagement in Standards



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

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

Credit: ODNI

Quad

U.S. • Australia • India • Japan

Credit: White House Photo by A. Schultz

IPEF

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

Credit: USTR

U.S.-UK Comprehensive Dialogue on Technology and Data

U.S. • UK

Credit: @StateDept



Manufacturing Program Updates



MEP Updates

- \$175M (+\$17M over FY2022)
- Additional \$13M in funding as part of the Disaster Supplemental “to help implement the Research and Development, Competition, and Innovation Act.”

Manufacturing USA Updates

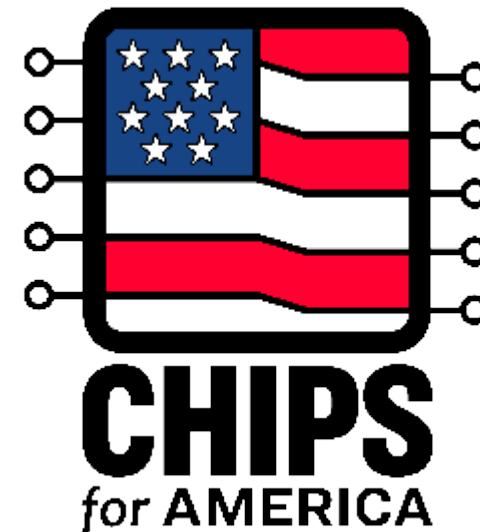
- NIST asked for public input on development of up to three new institutes focused on semiconductor manufacturing
- Public report expected in March

CHIPS Update



- Full funding announcement for Manufacturing Incentives coming in February 2023
- White Paper on the National Semiconductor Technology Center coming soon
- Rapidly hiring team members
- Industrial Advisory Committee met yesterday, February 7

More to come in this afternoon's session





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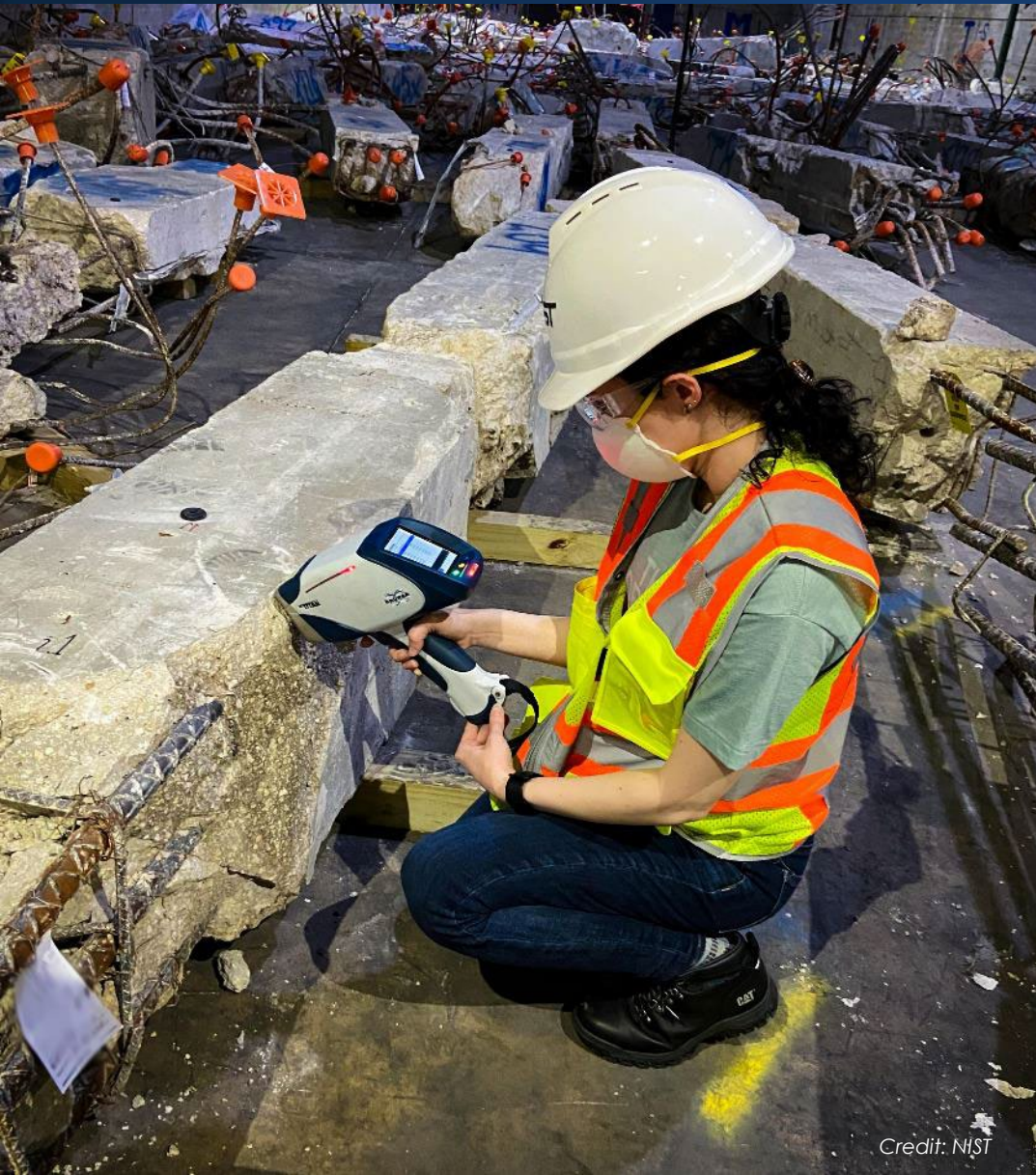
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NIST Disaster Investigations



Hurricane Fiona

- Understand impacts of power and water infrastructure damage to mitigation activities
- Examine compounding effects of Hurricane Maria on recovery of schools, hospitals, businesses, supply chains

Hurricane Ian

- Investigate storm surge damage to improve building codes and standards
- Study emergency communications and evacuation actions to improve emergency preparedness and response practices

Champlain Towers South

- Secure primary evidence warehouse
- Draft final report with recommendations for changes to codes, standards, and practices

NCNR Update



Reactor Operational Readiness

- NRC has completed the Technical Evaluation Report (TER) and is now in concurrence at NRC
- NRC will hold public meeting this month to inform public of basis for restart decision
- NRC then to issue TER report to NIST with restart authorization decision

Reactor Upgrades

- Operate for 4-5 cycles (~1 year) then shut down for upgrades
 - Double the data rates in the cold neutron guide hall
 - Additional 2 to 9 times gain for other instrumentation

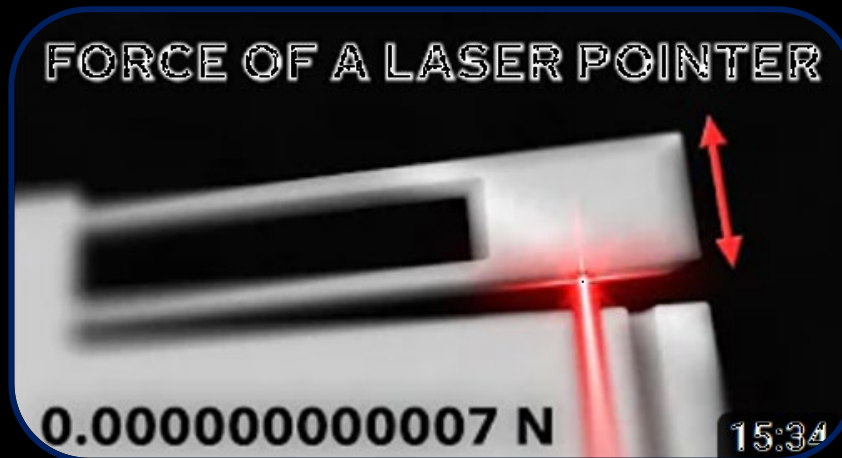
NCNR Leadership

- Dr. Rob Dimeo departing NIST in March
- NCNR Director vacancy to be posted
- Dr. Jim Adams will become Acting NCNR Director in interim

Expanding Our Reach (Visibility)



Veritasium Segments on You Tube



How to measure the tiniest forces in the universe: 3.5M views



The world depends on a collection of strange items: 6.3M views



DEI Strategic Plan

Return to Campus

DEIA Strategic Plan



NIST DEIA AT A GLANCE



38.9%
Women



27.9%
People of Color



9%
Individuals with Disabilities



8.1%
Military Members



Supporting a place where everyone is welcome and included

Return to Campus Update



Rebuilding our on campus community with intention

Discussion