

# 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**

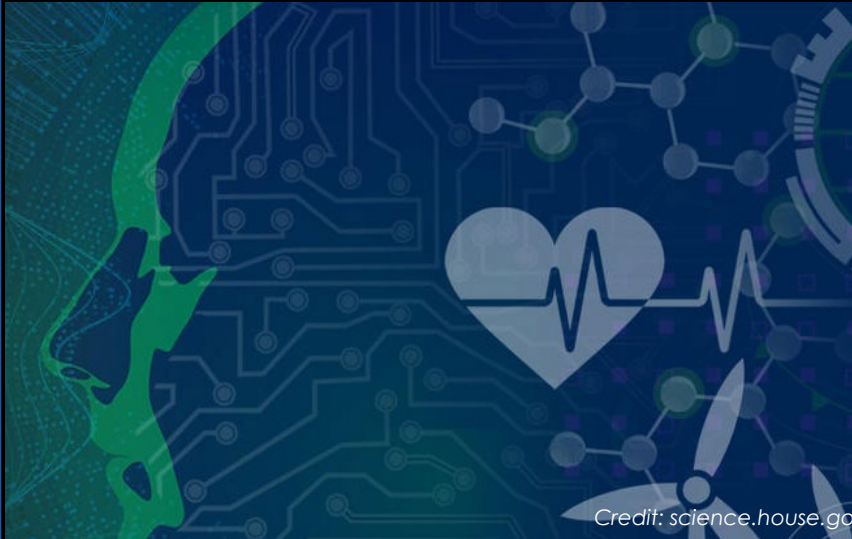
**Standards  
Leadership**

**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

## **3<sup>rd</sup> 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)



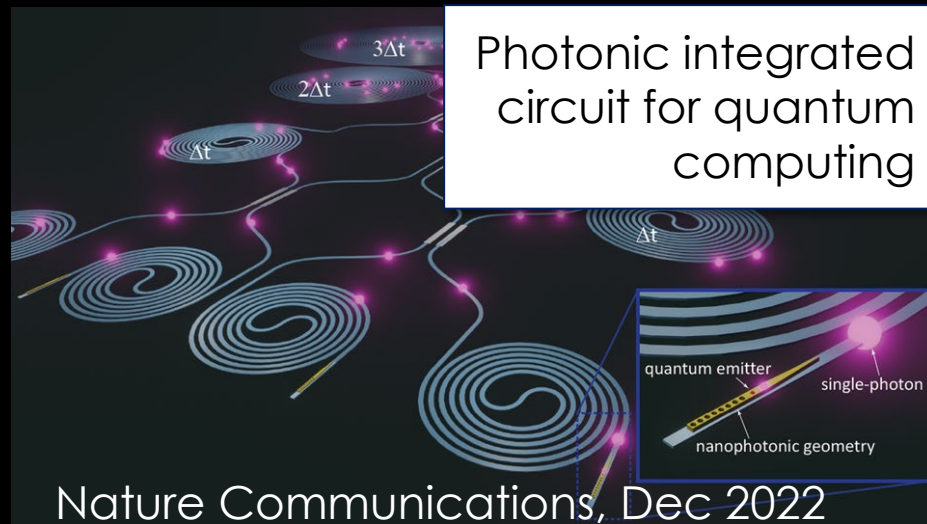
- AIM Photonics focus on manufacturing photonic chips
- NIST will design “calibration structures” to measure and test the performance of photonic chips at speed of up to 110 GHz

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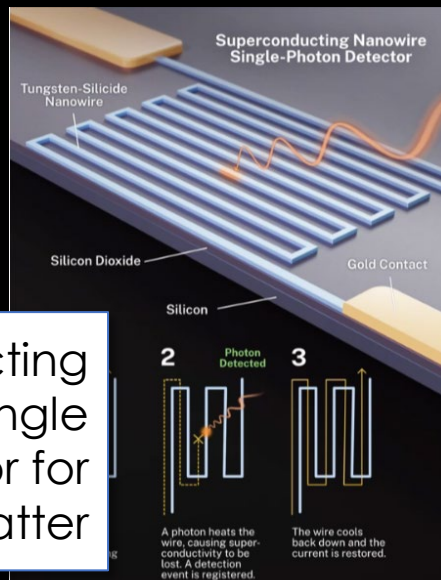
Article | [Published: 05 October 2022](#)

## 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

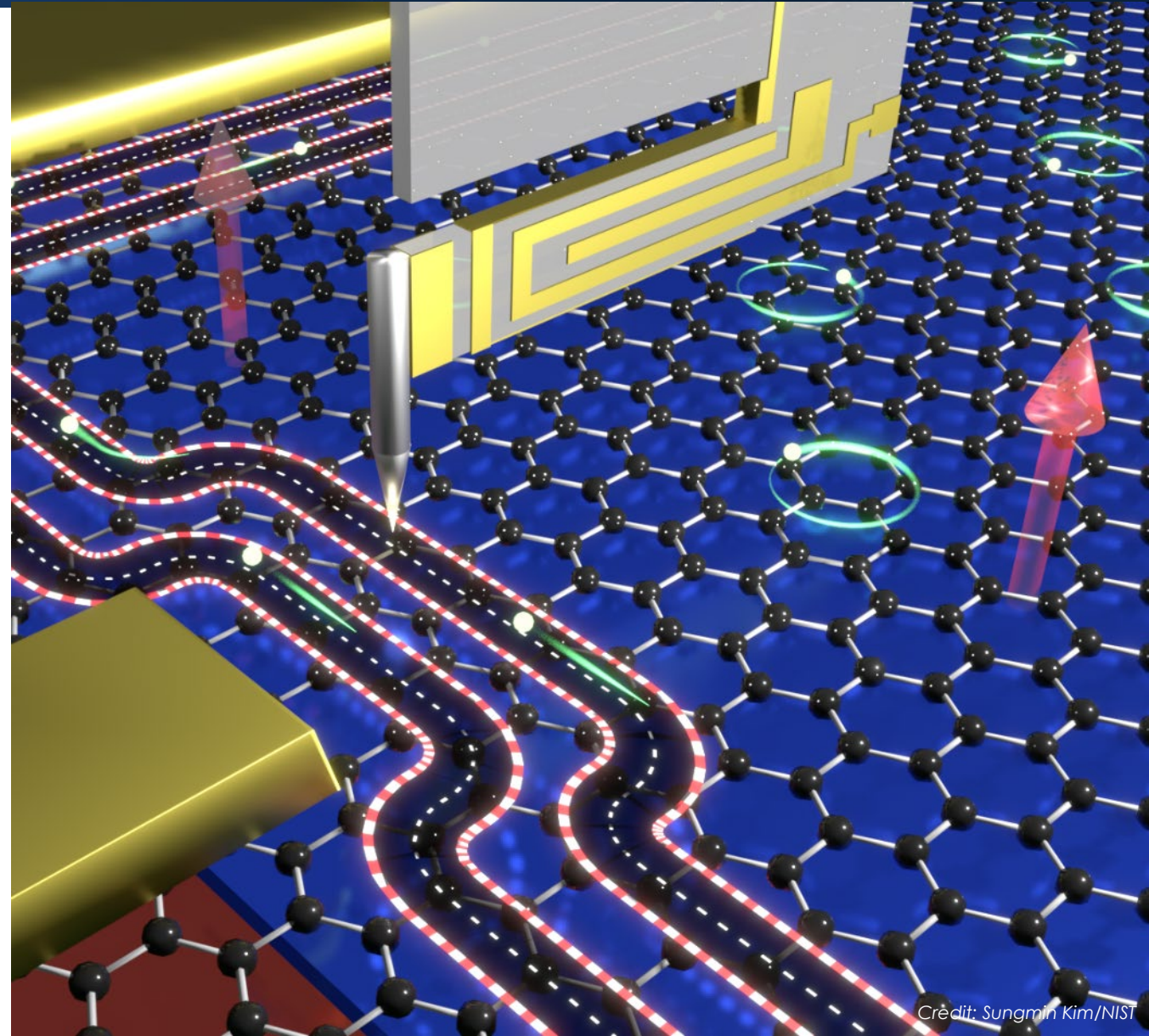
# NIST and Post-Quantum Cryptography



## 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



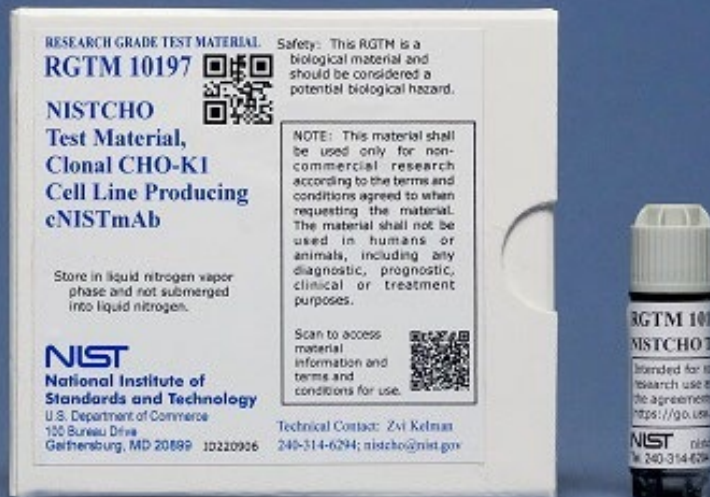
USE



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

## 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.

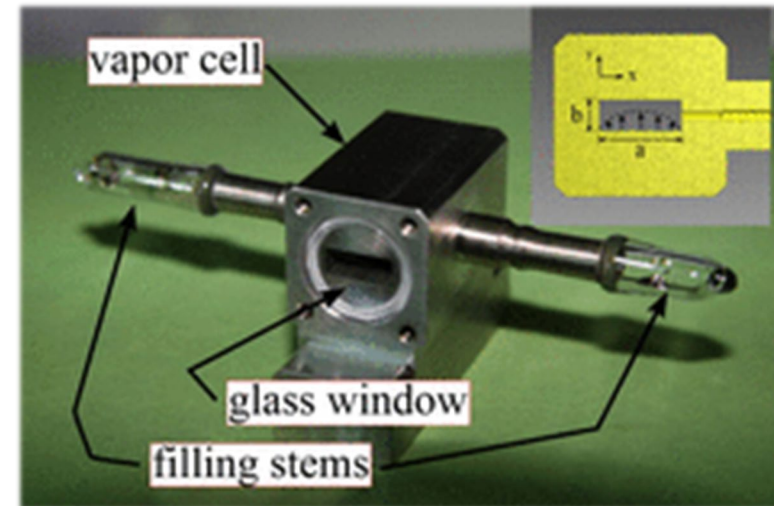
(12) **United States Patent**  
Holloway et al.

(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);



Critical &  
Emerging  
Technology  
Leadership

Standards  
Leadership

NIST  
Community

NIST

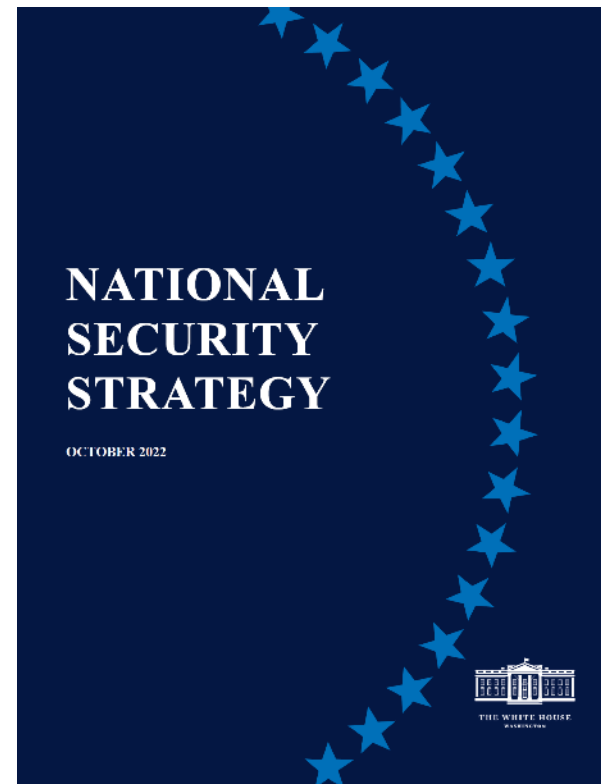
Mission  
Delivery  
Enhancement

Manufacturing  
Leadership

# 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

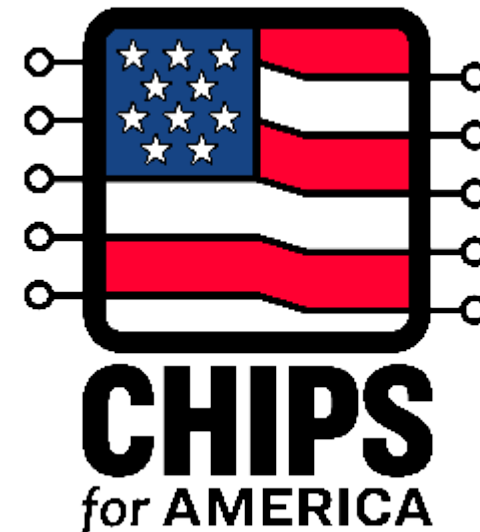
- NIST asked for public input on development of up to three new institutes focused on semiconductor manufacturing
- Public report expected in March

# 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**





**NIST**

Critical & Emerging Technology Leadership

Standards Leadership

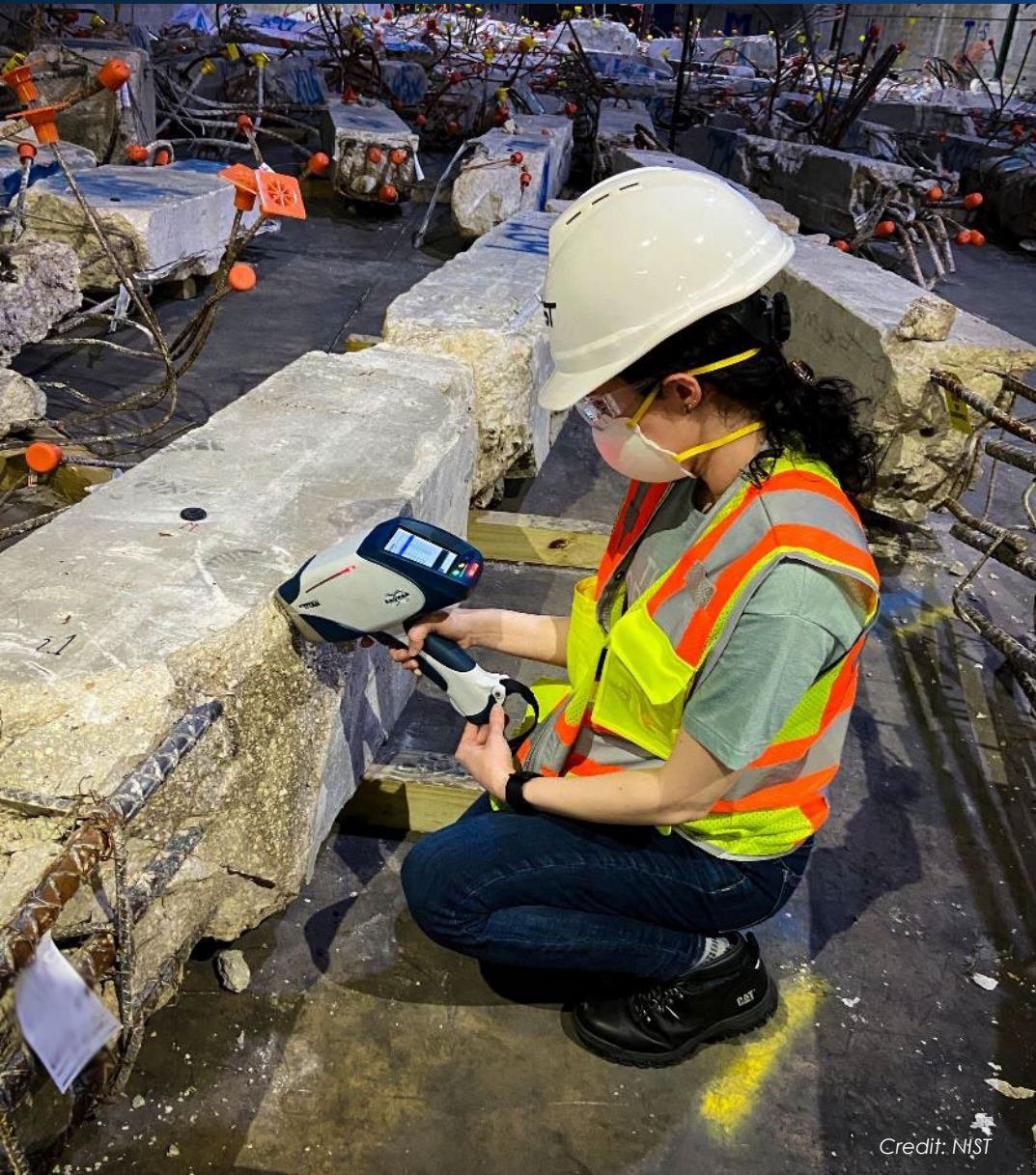
Manufacturing Leadership

Mission Delivery Enhancement

NIST Community



# 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

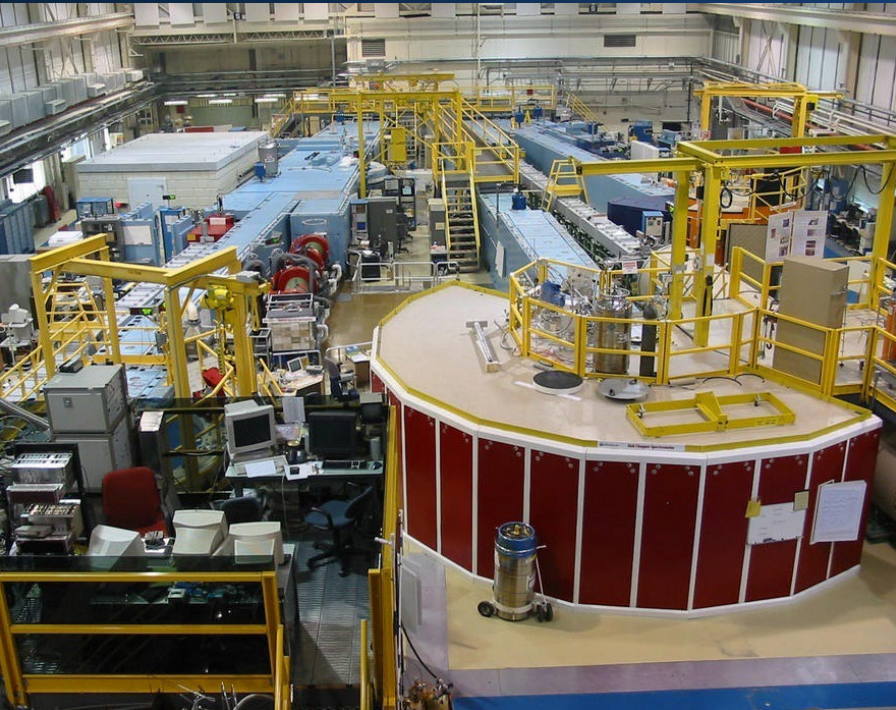
## Hurricane Ian

- 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

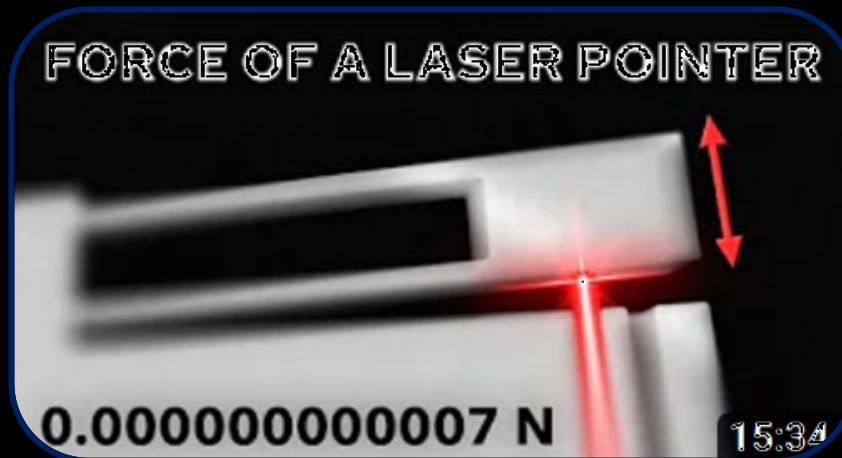
## NCNR Leadership

- 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