Image Credit: Shutterstock/NSF

DIRECTOR'S REMARKS

NATIONAL SCIENCE BOARD MEETING

Sethuraman Panchanathan, National Science Foundation

November 29, 2023

Image Credit: Senate Democratic Media Center

CHIPS & SCIENCE ACT OF 2022
MAKING PROGRESS

Image Credit: U.S. National Science Foundation

Testimony on CHIPS and Science Act

"As NSF continues to implement the CHIPS and Science Act,
we are doing so with a focus on expanding opportunities for all types of institutions,
in every geographic region, in every key technology area, and for everyone who wants to engage in STEM."

Image Credit: NSF

NSF's STRATEGIC PRIORITIES

STRENGTHENING ESTABLISHED NSF

With **investments that expand the frontiers of knowledge and discovery**

INSPIRING MISSING MILLIONS

Using **capacity building and interventions** that enhance and broaden participation

ACCELERATING TECHNOLOGY AND INNOVATION

Through innovative, **cross-cutting partnerships** and programs

Image Credit: NSF, Shutterstock

STRENGTHENING ESTABLISHED NSF

Image Credit: Shutterstock

2023 Nobel Prize Winners

2023 Nobel Prize Winners **supported by NSF**

Nobel Prize in Physics

4 AWARDS

Pierre Agostini
Ohio State University
Columbus, OH, USA

Ferenc Krausz
Max Planck Institute of Quantum Optics;
Ludwig-Maximilians-Universität München,
Germany

Anne L'Huillier
Lund University
Sweden

Nobel Prize in Chemistry

GRFP, CAREER,
10 AWARDS

Moungi G. Bawendi
Massachusetts Institute of Technology (MIT)
Cambridge, MA, USA

GRFP, IGERT,
1 AWARD

Louis E. Brus
Columbia University
New York, NY, USA

Alexei I. Ekimov
Nanocrystals Technology Inc.
New York, NY, USA

Prize in Economic Sciences in Memory of Alfred Nobel

8 AWARDS

Claudia Goldin
Harvard University
Cambridge, MA, USA

Nobel Prize in Phycology or Medicine

Drew Weissman
Penn Institute for RNA Innovations
Philadelphia, PA, USA

Katalin Karikó
Szeged University, *Szeged, Hungary*
University of Pennsylvania, *Philadelphia, PA, USA*

Image Credit: Shutterstock

Image Credits: John D. and Catherine T. MacArthur Foundation

2023 MacArthur Fellowship Winners

Rina Foygel Barber
Statistician
University of Chicago

Lucy Hutyra
Environmental Ecologist
Boston University

Linsey Marr
Environmental Engineer
Virginia Tech

MacArthur Foundation

Amber Wutich
Anthropologist
Arizona State University

A. Park Williams
Hydroclimatologist
University of California, Los Angeles

Lester Mackey
Computer Scientist and Statistician
Microsoft Research

Over 33 NSF investments

Supported by **7 different directorates and offices**

Including **3 CAREER awards**

Image Credit: Charlotte Geary/NSF
Logo Credit: Civic Innovation Challenge

Civic Innovation Challenge (CIVIC) Awards

- Supported by **$19M** from NSF **in partnership** with DHS and DOE
- **19 teams** across the nation
- Comprised of **2 tracks:**
  - **Track A:** 10 teams. Focuses on living in a changing climate, including pre-disaster action based around adaptation, resilience, and mitigation
  - **Track B:** 9 teams. Focuses on bridging the gap between essential resources and services and community needs

RAPID.
LOCAL.
CO-CREATED.
IMPACTFUL.

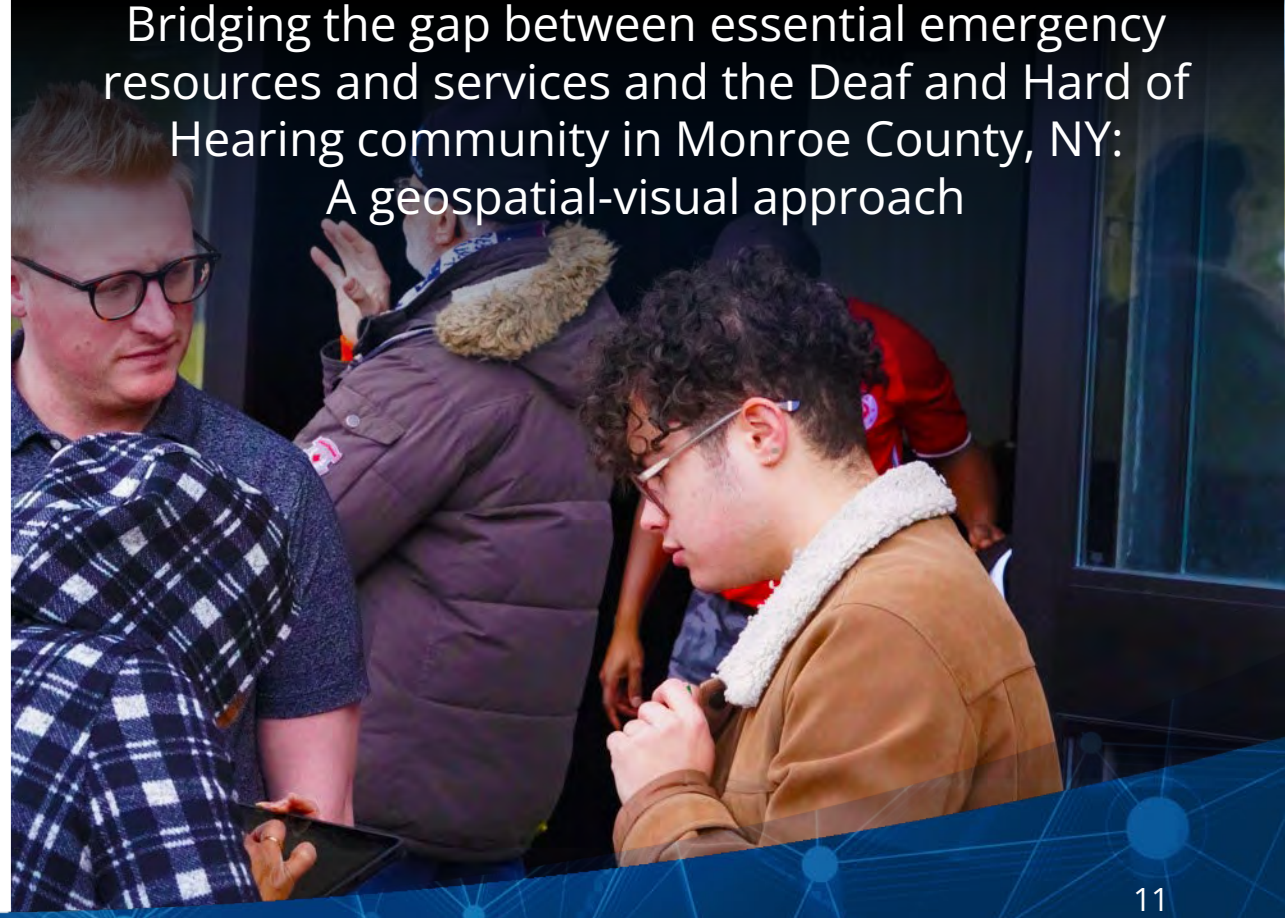
CIVIC INNOVATION CHALLENGE

Image Credit: Eastie Farm Rochester Institute of Technology

TRACK A:
Eastie Farm

TRACK B:
Rochester Institute of Technology

Bridging the gap between essential emergency resources and services and the Deaf and Hard of Hearing community in Monroe County, NY: A geospatial-visual approach



Designing Materials to Revolutionize and Engineer Future (DMREF) Awards

- **$72.5M** to design revolutionary materials
- **Supporting 37 teams** to create novel materials to address societal challenges and develop the scientific and engineering workforce
- Awards involve **161 researchers** at **61 universities** across **30 states**

Image Credit: Amar Flood/Indiana University

Image Credit: Shutterstock

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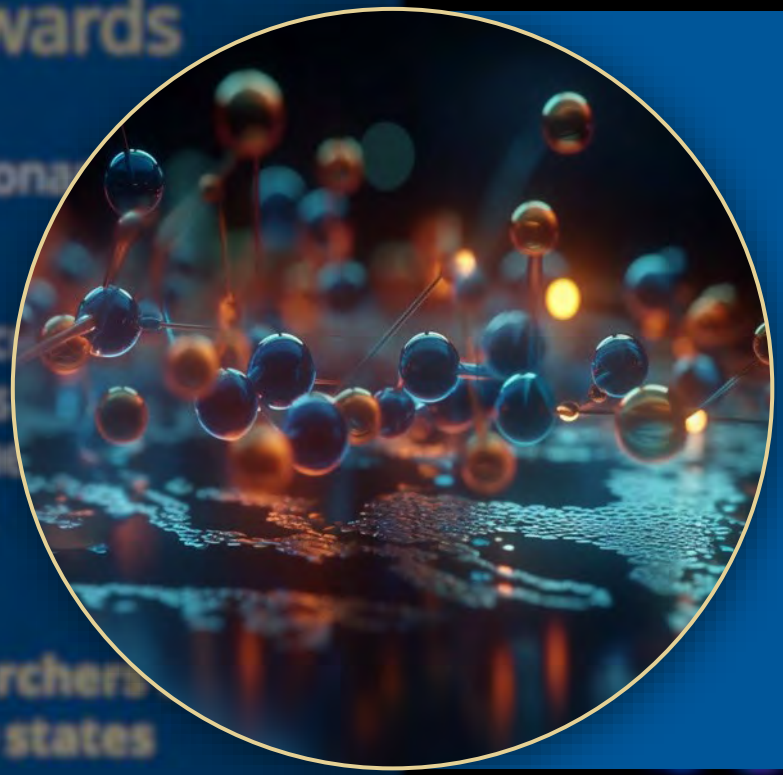

- *Collaborative Research:* Development of an optimum electrolyte solution for advanced rechargeable batteries
- Led by *Northern Illinois University*, in partnership with the University of Michigan and the University of Illinois at Chicago

Mid-Scale Research Infrastructure

- NSF announces **4** Mid-scale Research Infrastructure-1 **investments**
- Mid-scale RI-1 investments **support** the **design and implementation of research infrastructure**
- Awardees exemplify **the best** of **American science and engineering**

Mid-Scale Research Infrastructure

Cybersecurity

University of Southern California

- **$18M investment** in a Reproducible Cybersecurity Experimentation **(SPHERE)** testbed
- SPHERE's built-in mechanisms support the **reproducibility and replicability of cyber-physical devices**
- Offers **at-scale, real-time cybersecurity, and cyber-privacy experimentation**

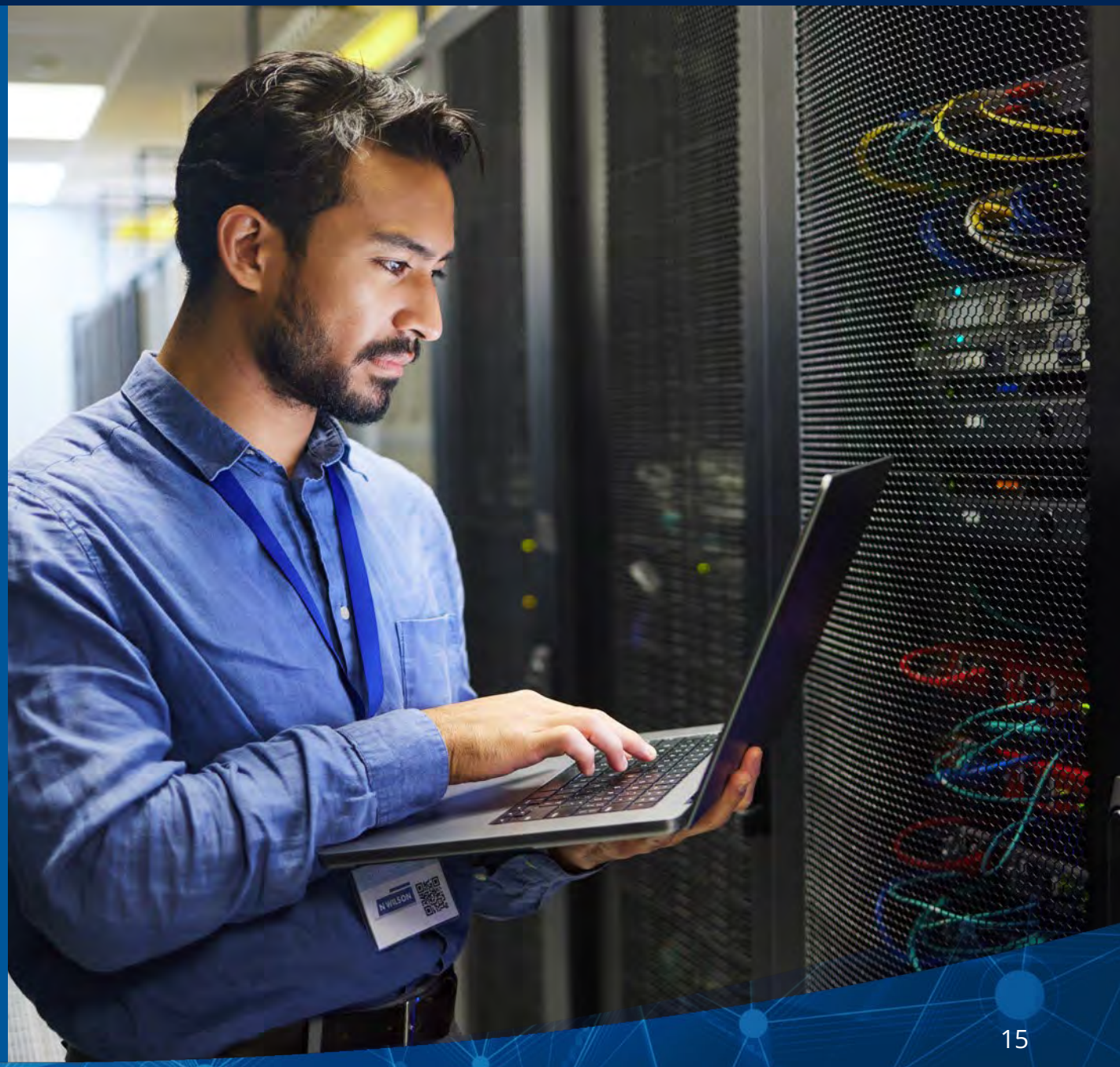

Image Credit: Shutterstock

Image Credit: Charlotte Geary/NSF

CAPITOL HILL AI INSTITUTES SHOWCASE

Image Credit: Charlotte Geary/NSF

- **Firsthand engagement for Congress** with NSF investments and federal support for **AI innovation, partnerships, and workforce development**

- **More than 100 congressional staff** were able to engage with representatives from all 25 AI Institutes

- Highlighted **NSF's $500 million investment** connecting **more than 500 funded and collaborative institutions**

Image Credit: U.S. National Science Foundation

Image Credit: U.S. National Science Foundation

BIDEN ADMINISTRATION'S EXECUTIVE ORDER ON AI

NAIRR

ExpandAI

Safeguarding AI awards

Image Credit: U.S. National Science Foundation

$837 MILLION NSF INVESTMENTS IN AI IN FY2023

Expands Workforce Training and Education Opportunities

$65 million for Artificial Intelligence Institutes

Image Credit: Shutterstock

Experiential Learning for Emerging and Novel Technologies (ExLENT) Awards

- **$18.8M** investment in **27 awards** to expand opportunities in **key technologies**
- Teams will receive up to **$1M** for **3 years**
- 18 teams in **Beginners Track** and **9** in the **Pivots Track**

Image Credit: U.S. National Science Foundation

AI-Externship Project
North Carolina State University

Growing the Future STEM Workforce

- **40-week externship** in **data science and AI** for diverse, underrepresented students
- Combination in-class sessions with **real-world, industry mentoring**
- **Partnering** with **Delta Air Lines, Lexmark, Randstad**, and other industry organizations

Image Credit: Shutterstock

Enabling Partnerships to Increase Innovation Capacity (EPIIC) Awards

- **$19.6M** investment in **teams** from **two-year institutions**, **HBCUs**, and other **MSIs**
- Awardees will receive up to **$400,000** over **3 years**
- Provides network opportunities to grow **external partnerships**

Image Credit: U.S. National Science Foundation

Bowie State University Collaborative

Leveraging Innovation to Grow High Tech and University Partnerships (LIGHT UP)

- Creating a **regional STEM talent** pipeline and workforce in the Northeast
- Industry, government, and university **collaborative focus on entrepreneurship**
- From **research commercialization** to **economic development**

Image Credit: Shutterstock

Image Credit: Morgan State University

Morgan State University's CREST

- **$5M** investment in the CREST **Center for Advanced Magnets and Semiconductors** at MSU, Maryland's **largest HBCU**
- Cultivating a pipeline of **future professionals** in the field of quantum materials and engineering through outreach efforts, education, and workforce development
- **Focused** on bringing together neighboring institutions to **perform bold and innovative studies**

Image Credit: U.S. National Science Foundation

The New Arecibo C3 Center

- **$5M** investment for a new educational center at the Arecibo Observatory site in Puerto Rico
- A **collaborative partnership** between the University of Puerto Rico-Río Piedras, Universidad del Sagrado Corazón, the University of Maryland, Baltimore County, and Cold Spring Harbor Laboratory
- Prioritizing **community engagement** — particularly for underrepresented groups — throughout its **STEM education and outreach programs**

Image Credit: Shutterstock

TECHNOLOGY, INNOVATION AND PARTNERSHIPS

Image Credit: U.S. National Science Foundation

Engines Contractor Builder Award

- Three-year investment of **$9.5M** in The Engine Accelerator
- Will develop, launch, and run a platform to provide **tailored resources** and **engagement** to NSF Engines
- A new way of thinking about post-award support that **empowers stakeholders** with the tools, networks, and support they need to thrive

NSF Future of Semiconductors (FuSe) Awards

- **$45.6M** investment across **24 research** and **education projects** to strengthen the U.S. semiconductor workforce
- Leverages an additional **$200M** in appropriations from **CHIPS and Science Act**
- Supported by public-private **partnerships** with **Ericsson, IBM, Intel, and Samsung**

Image Credit: Daryl Marshke (courtesy of Franko Bayer/University of Michigan/Center for Ultrafast Optical Science)

University of Washington Collaborative Research Project

Co-designing Electronic and Optical Computational Devices (PHACEO)

- Partnering with University of Maryland and Howard University to **exchange research, mentorship, and training**
- Creating **energy-efficient materials** for storing and processing data for integration into **new computational devices**
- Establishing a **robust pipeline** to **educate the next-generation workforce** in cross-cutting fields

Image Credit: Donhee Ham Research Group/Harvard SEAS

Image Credit: U.S. National Science Foundation

Pathways to Enable Open-Source Ecosystems (POSE) Phase II Awards

- **$26M** investment in **19 Phase II Open-Source projects**
- Awardees will receive up to **$1.5M** over **2 years**
- From **open-market research** to **open-market solutions**

Image Credit: Shutterstock

University of California Regents—Scenic

Open-source Language and Toolkit Supporting AI Systems

- Creating design, verification, and deployment of **Scenic** in new **AI systems**, including transportation, energy, healthcare, and finance
- **Preventing failures** that can compromise overall system safety
- Employing **Scenic activities targeted** to **educational outreach** for undergraduate and high-school students

Image Credit: U.S. National Science Foundation

Global Centers

program aims to support large-scale collaborative research on use-inspired themes in climate change and clean energy

Track 1:
Global Center Implementation: Research Partnerships with Australia, Canada, and UK

Track 2:
Community-driven Global Center Design

UK Research and Innovation

CSIRO
Australia's National Science Agency

Canada

Image Credit: U.S. National Science Foundation

Great Lakes Megaregion

Global Centre for Clean Energy and Equitable Transportation Solutions

NSF-UKRI partnership fostering research networks to decarbonize road transportation, establish a novel education platform, and engage communities

South Wales & West Midlands

Image Credit: Shutterstock

CONGRESSIONAL ENGAGEMENTS

Image Credit: Regents of the University of Minnesota

Image Credit: Amanda Greenwell/NSF

Image Credit: Northeastern University/Matthew

Image Credit: Rob Moeller/NSF

Image Credit: Regents of the University of Minnesota

University of Minnesota
With Sen. Klobuchar

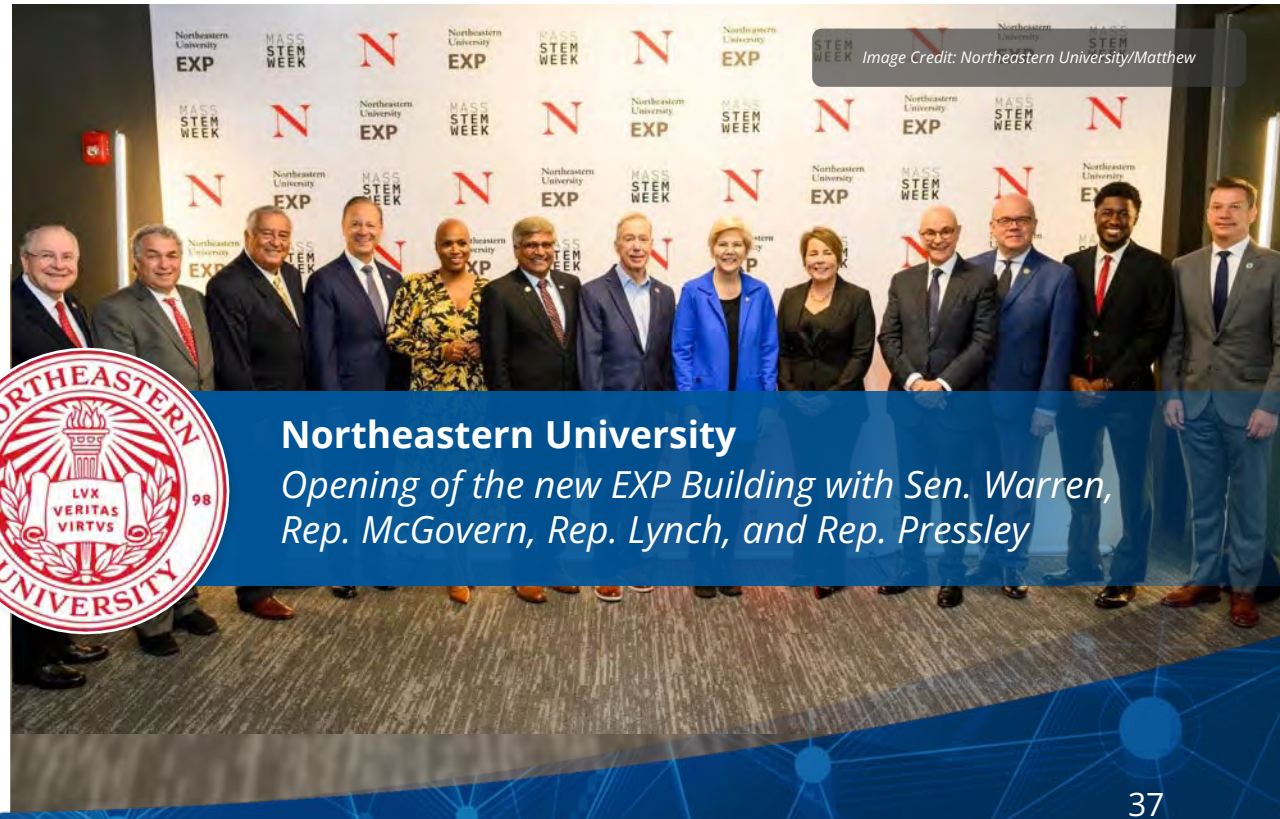

Image Credit: Northeastern University/Matthew

Northeastern University
Opening of the new EXP Building with Sen. Warren, Rep. McGovern, Rep. Lynch, and Rep. Pressley

Image Credit: Karen Lips, NSF


Image Credit: Valerie Caviness / The State University of New York


Image Credit: Charlotte Geary/NSF

Image Credit: Greater Austin Asian Chamber of Commerce


Image Credit: J.Pope/NSF

External Engagements


Image Credit: U.S. Consulate General Mumbai


Image Credit: Giovanni Rodriguez/NSF


Image Credit: Giovanni Rodriguez/NSF

Image Credit: Samuel Stuart Hollenshead


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Image Credit: UC Santa Barbara


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Image Credit: US-Singapore Critical and Emerging Technology Dialogue,

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Senior Executive Introductions

OLPA Update

Image Credit: Shutterstock