



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

# Technology, Innovation and Partnerships Updates Webinar

Erwin Gianchandani, Shelby Smith, James Joshi, Ben Schrag, and Grace Yuan

Sept. 18, 2024



# MISSION

PROMOTE the progress of science

ADVANCE the national health, prosperity, and welfare

SECURE the national defense

# NSF Supports Science & Engineering



Integrative Activities

International Science & Engineering

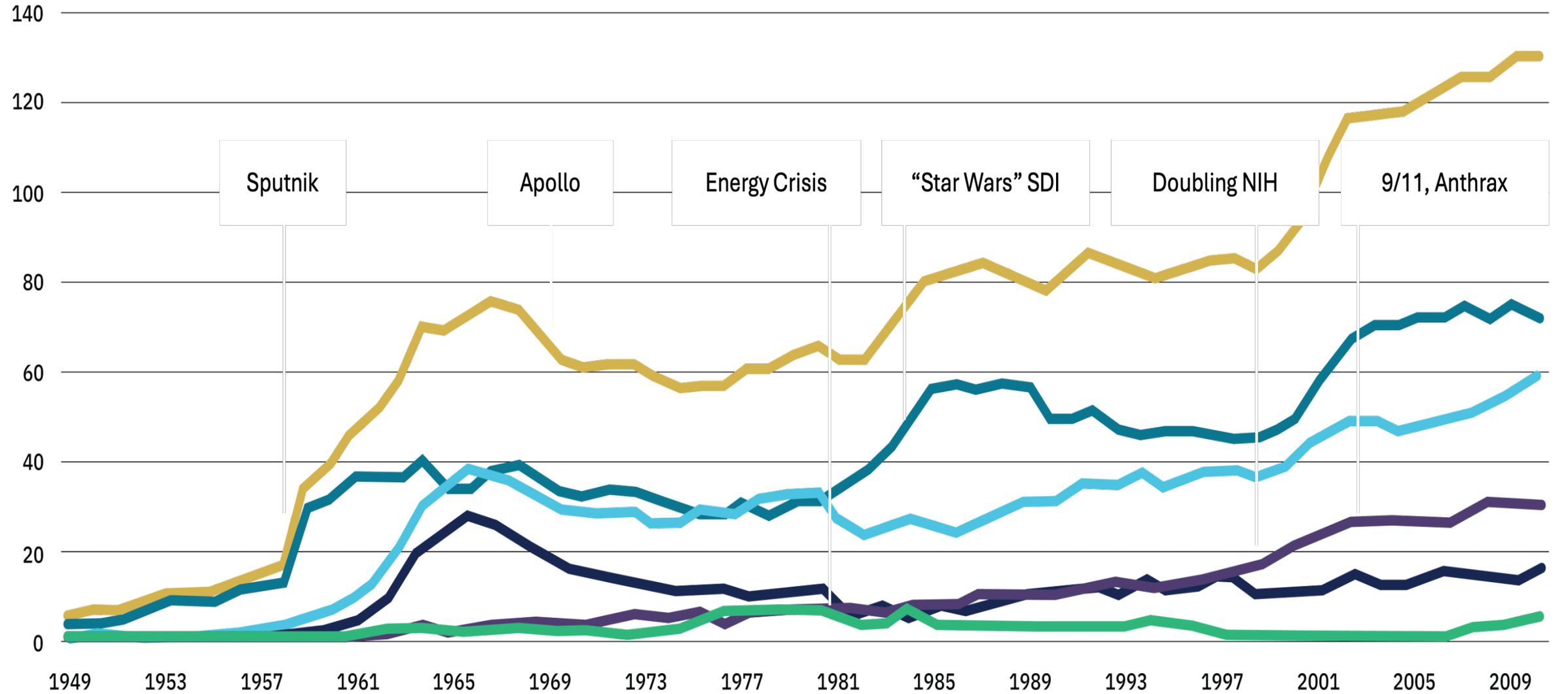
# A Historic Role for STEM



U.S. National Science Foundation  
 Directorate for Technology, Innovation  
 and Partnerships

Billions of constant 2005 dollars

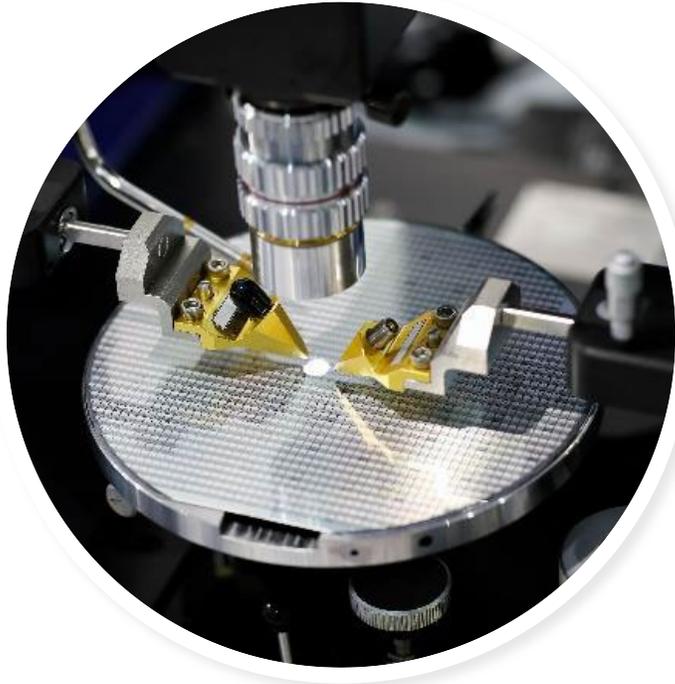
■ Total Federal R&D 
 ■ Defense R&D 
 ■ Total non-defense 
 ■ Health 
 ■ General science and space 
 ■ Energy



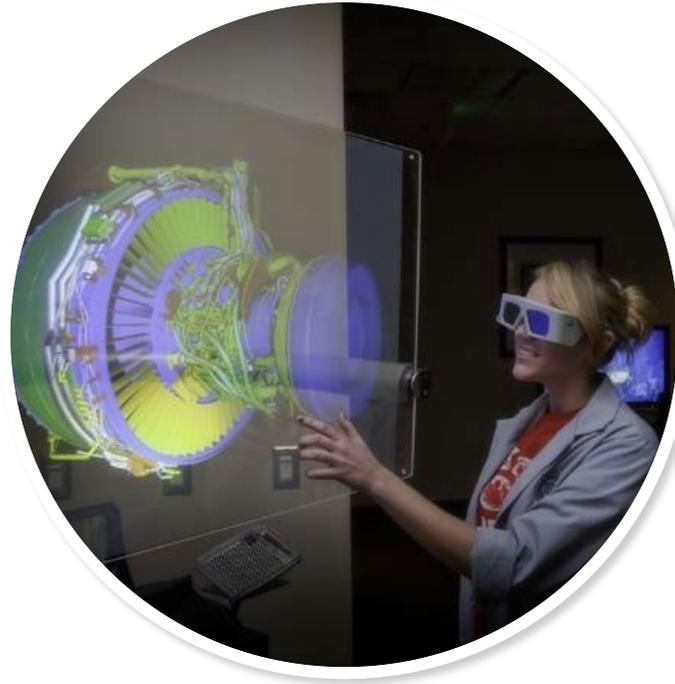
# An Era of Unprecedented Technological Innovation



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships



**Data, emerging technologies accelerating discovery, innovation**



**National, societal, geostrategic opportunities**



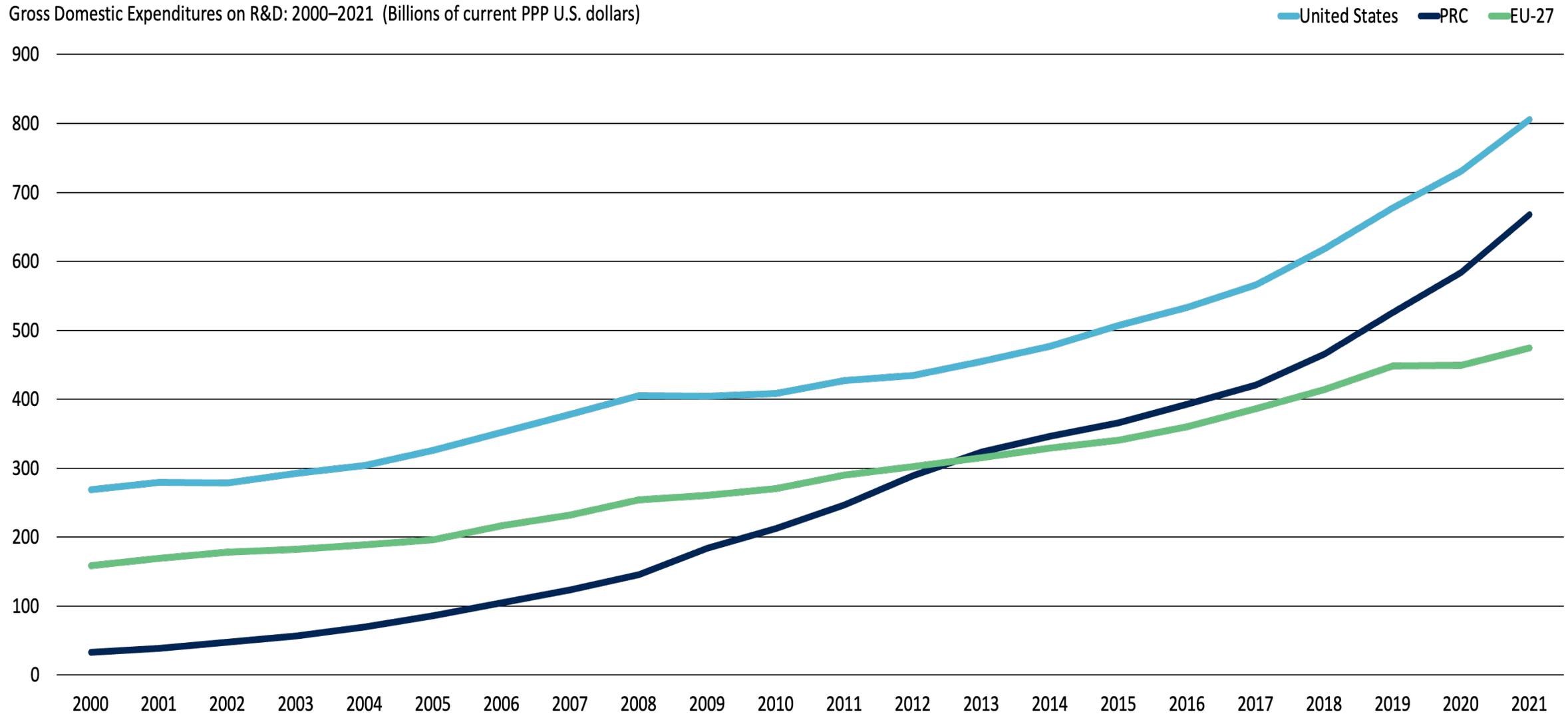
**Cross-sector talent engagement**

# Gross Domestic R&D Investment



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

Gross Domestic Expenditures on R&D: 2000–2021 (Billions of current PPP U.S. dollars)



# CHIPS & SCIENCE

**10** KEY TECHNOLOGY AREAS

Artificial Intelligence



Advanced Communications and Wireless Technology



High-Performance Computing



Data and Cybersecurity



Quantum Information Science



Biotechnology



Robotics, Automation, and Advanced Manufacturing



Advanced Energy and Energy Efficiency



Resilience, Disaster Prevention, and Mitigation



Advanced Materials Science





U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

## TIP Directorate Mission

TIP harnesses the nation's vast and diverse talent pool to advance critical and emerging technologies, address pressing societal and economic challenges, and accelerate the translation of research results from lab to market and society. TIP improves U.S. competitiveness, growing the U.S. economy and training a diverse workforce for future, high-wage jobs.

## Today

Largely investigator-driven

Primarily academic research teams

Stream of discoveries improve prosperity, resilience, quality of life

**“Technology / supply push”**



## Tomorrow

Users / beneficiaries engaged in shaping, conducting research

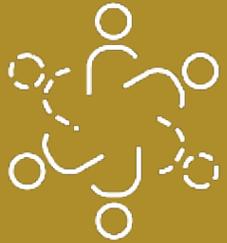
Multi-sector teams – academia, industry, government, civil society, communities of practice

Important societal and/or economic problems drive research pursuits

**“Market / demand pull”**

# TIP's Three Pillars

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development

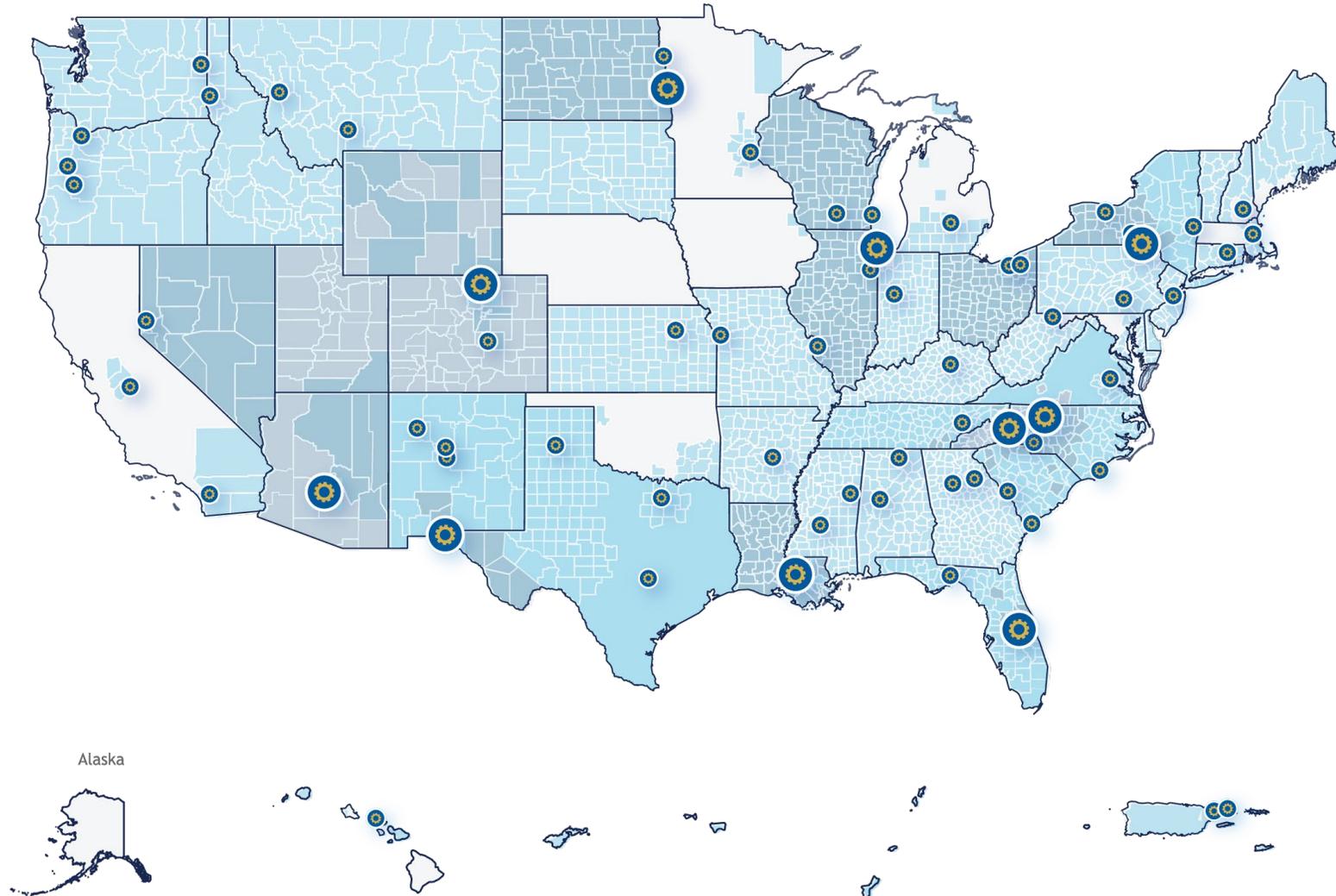


Workforce Development

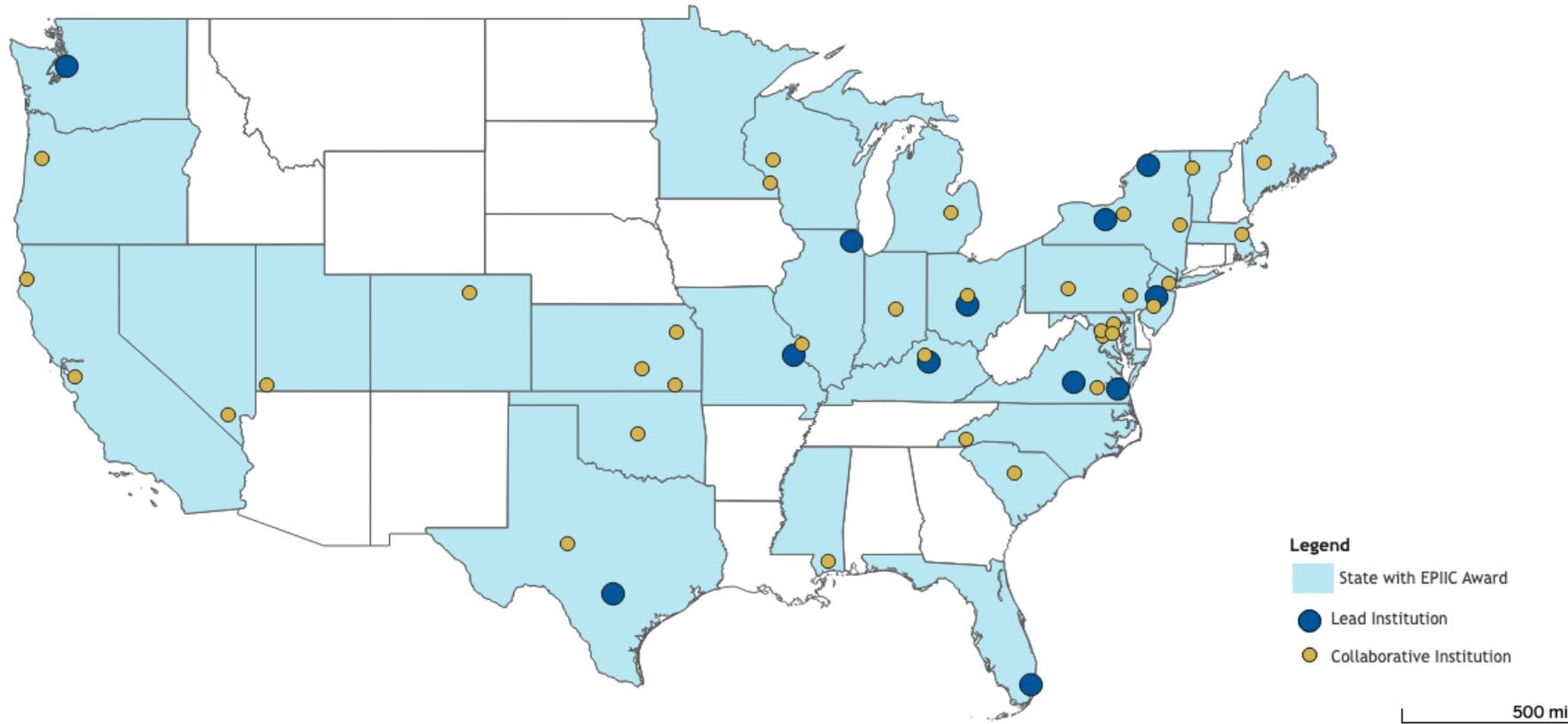
# NSF Engines: Making History

## NSF Engines awards represent:

- \$1.6 billion over a decade
- 450+ partners across sectors
- 18 states across 10 regions; 69 regions total across the U.S.
- 2:1 matched investment from public and private sectors
- Catalyzing America's innovation economy in all corners of the country



# EPIIC Builds Capacity



**49**  
 EPIIC Awards

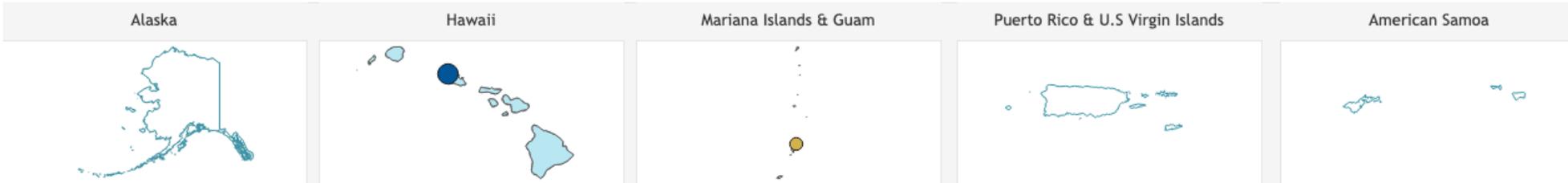
New Awardee  
 N  
 Y

Awards in EPSCoR States  
 12

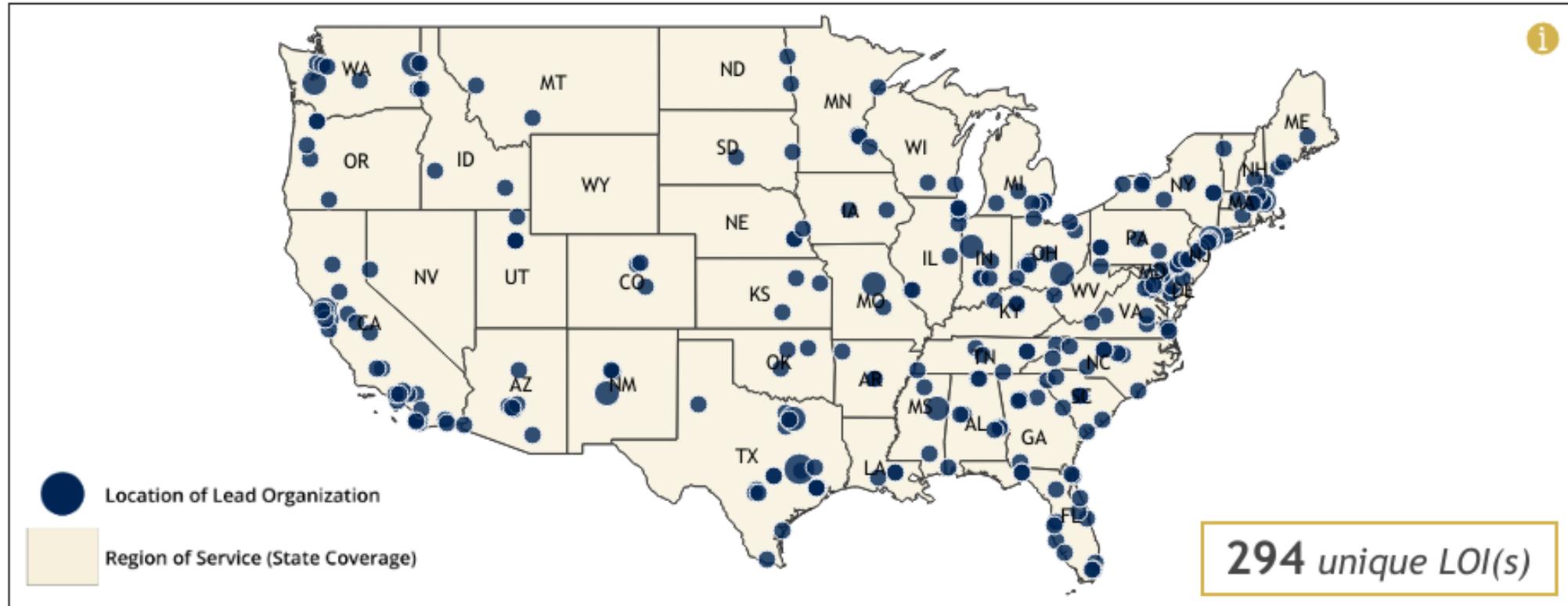
Awards to MSIs  
 14

**Organization Type**

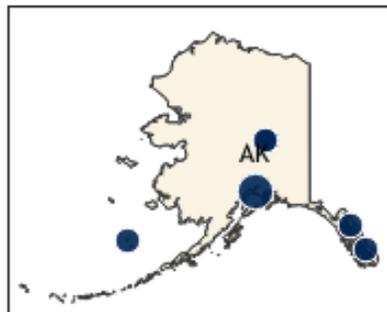
Community College	4	14
Master's Colleges	3	14
Baccalaureate Colleges	4	7
Doctoral/Professional Universities	1	1
R1	1	



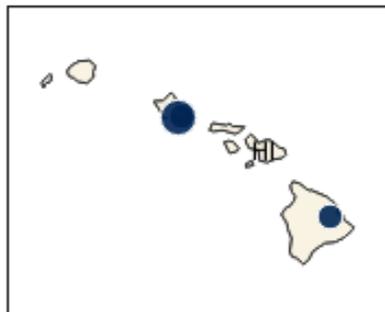
# New NSF Engines Competition



Alaska



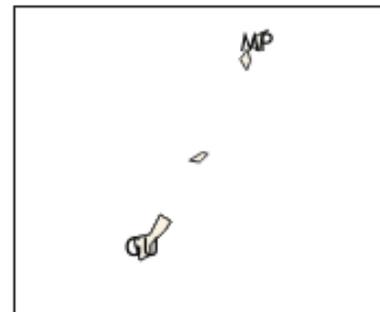
Hawaii



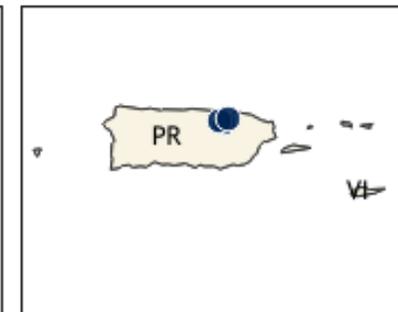
American Samoa



Guam & Mariana Islands

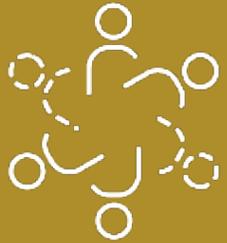


Puerto Rico & U.S. Virgin Islands



# TIP's Three Pillars

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development



## IDEATION (DCL/RFI, WORKSHOPS):

Selected by gathering input from the community. Identified topics must meet a societal need at scale, be built upon foundational research and be suitable for a multidisciplinary, convergence research approach.

## PHASE 1 (PLANNING):

Up to \$750K over 9 months is provided to further develop the initial concept (building upon basic research), identify new team members/partners, participate in a hands-on innovation curriculum and develop an initial low-fidelity prototype.

## PHASE 2 (IMPLEMENTATION):

Up to \$5M over 24 months to develop solution prototypes and to build a sustainability model to continue impact beyond NSF support.



Convergence



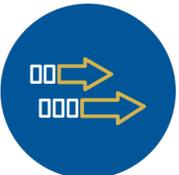
Cross-cutting Partnerships



Deliverables



Broadening Participation



Track Alignment

# Convergence Accelerator Portfolio



## Track A

Open Knowledge Networks



## Track B

AI and the Future of Work



## Track C

Quantum Technology



## Track D

AI-Innovation Data Sharing & Modeling



## Track E

Networked Blue Economy



## Track F

Trust & Authenticity in Communication Systems

**2019 COHORT**  
Complete

**2020 COHORT**  
Phase 2

**2021 COHORT**  
Phase 2



## Track G

Securely Operating Through 5G Infrastructure



## Track H

Enhancing Opportunities for Persons with Disabilities



## Track I

Sustainable Materials for Global Challenges



## Track J

Food & Nutrition Security



## Track K

Equitable Water Solutions



## Track L

Real-World Chemical Sensing Applications



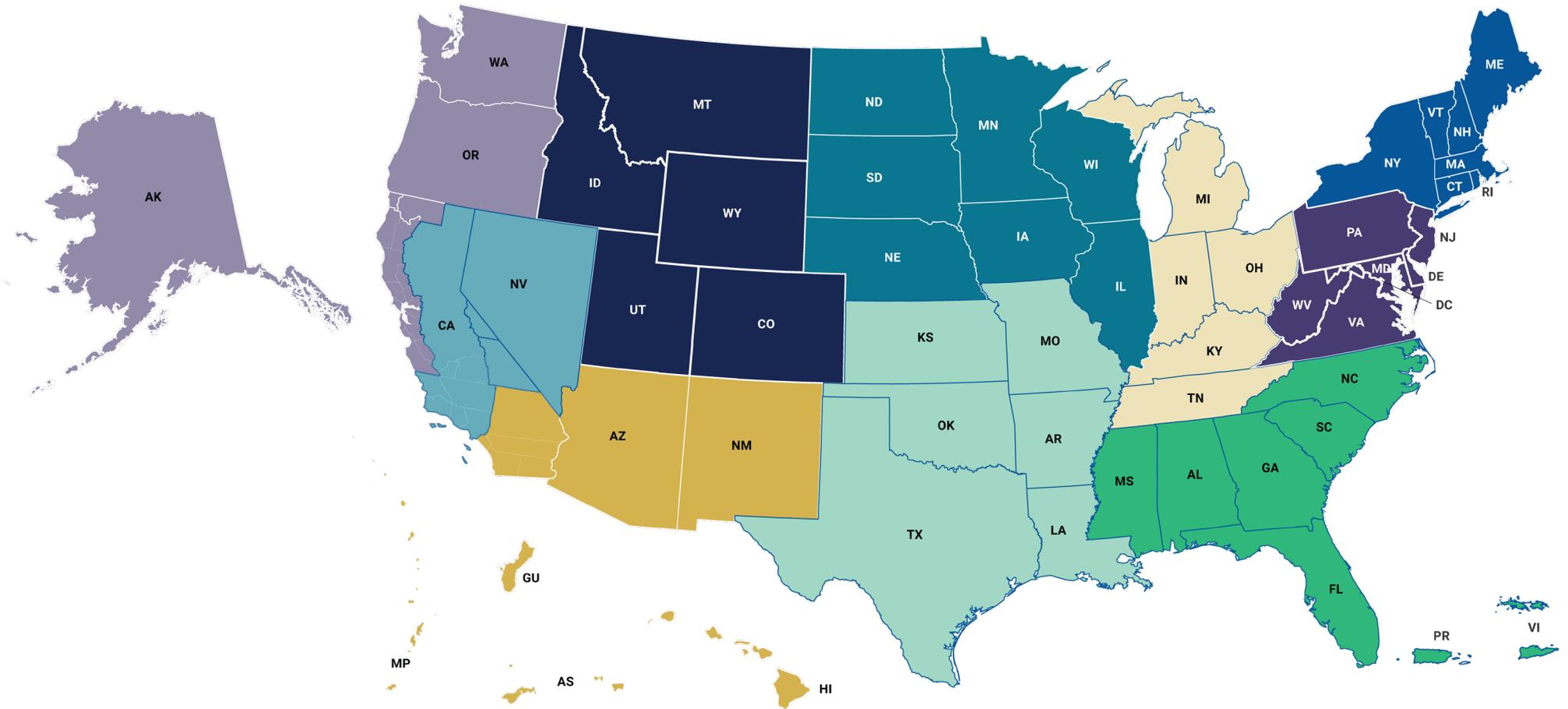
## Track M

Bio-Inspired Design Innovations

**2022 COHORT**  
Phase 2

**2023 COHORT**  
Phase 1

# NSF Convergence Accelerator Expansion



## Regions

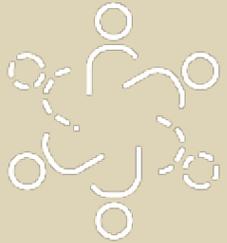
- Northwest
- West
- Mountain
- Southwest
- Midwest
- South Central
- Central
- Southeast
- Mid Atlantic
- Northeast

# Regional Expansion Rollout

<b>Stage 1</b> 2024-2025	Midwest Region (MW)	<b>North Dakota, South Dakota, Nebraska</b> , Minnesota, <b>Iowa</b> , Wisconsin and Illinois	May 2024
	Southeast Region (SE)	North Carolina, <b>South Carolina</b> , Georgia, Florida, <b>Alabama, Mississippi, Puerto Rico</b> and <b>U.S. Virgin Islands</b>	July 2024
	Northeast Region (NE)	<b>Maine, New Hampshire, Vermont</b> , Massachusetts, <b>Rhode Island</b> , Connecticut and New York	November 2024
	Southwest Region (SW)	Arizona, <b>New Mexico, Hawaii</b> , the <b>U.S. Territories of Guam</b> , Northern Mariana Islands, American Samoa and the following counties of California: Imperial, Orange, Riverside, San Bernardino and San Diego	February 2025
<b>Stage 2</b> 2025-2026	Mid-Atlantic Region (MA)	Pennsylvania, Maryland, Virginia, <b>West Virginia, Delaware</b> , New Jersey and the District of Columbia	Summer 2025
	South Central Region (SC)	Texas, <b>Oklahoma, Arkansas, Louisiana</b> , Missouri and <b>Kansas</b>	Fall 2025
	Northwest Region (NW)	<b>Alaska</b> , Washington, Oregon, and the following counties of California: Alameda, Contra Costa, Del Norte, Humboldt, Lake, Marin, Mendocino, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Siskiyou, Solano, Sonoma and Trinity	Winter 2026
<b>Stage 3</b> 2026-2027	Central Region (CT)	Indiana, Michigan, Ohio, <b>Kentucky</b> and Tennessee	Summer 2026
	Mountain Region (MT)	<b>Montana, Idaho</b> , Utah, Colorado and <b>Wyoming</b>	Fall 2026
	West Region (W)	<b>Nevada</b> and the following counties of California: Alpine, Amador, Butte, Calaveras, Colusa, El Dorado, Fresno, Glenn, Inyo, Kern, Kings, Lassen, Los Angeles, Madera, Mariposa, Merced, Modoc, Mono, Nevada, Placer, Plumas, Sacramento, San Joaquin, San Luis Obispo, Santa Barbara, Shasta, Sierra, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Ventura, Yolo and Yuba	Winter 2027

# TIP's Three Pillars

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation and Ecosystems



Technology Translation and Development



Workforce Development

# CHIPS & SCIENCE

**10** KEY TECHNOLOGY AREAS

Artificial Intelligence



Advanced Communications and Wireless Technology



High-Performance Computing



Data and Cybersecurity



Quantum Information Science



Biotechnology



Robotics, Automation, and Advanced Manufacturing



Advanced Energy and Energy Efficiency



Resilience, Disaster Prevention, and Mitigation



Advanced Materials Science



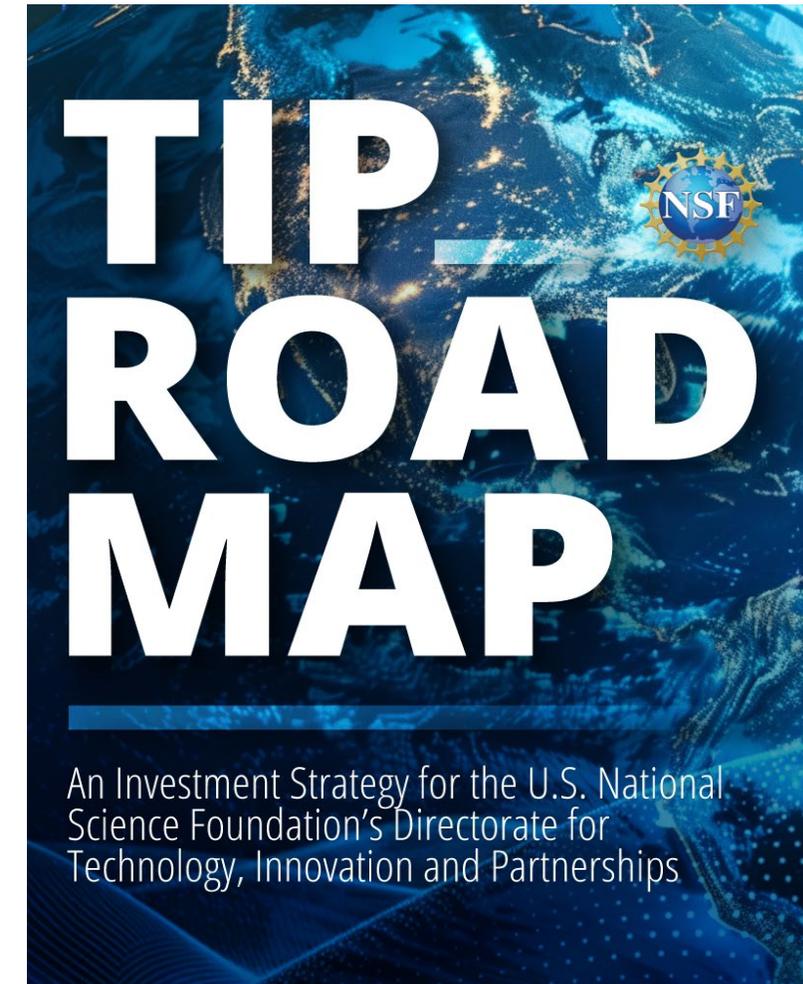
## TIP Releases 2024 Investment Roadmap

An investment roadmap outlining the directorate's strategic vision that will, in turn, guide initial investment decisions focused on advancing U.S. competitiveness in key technology areas.

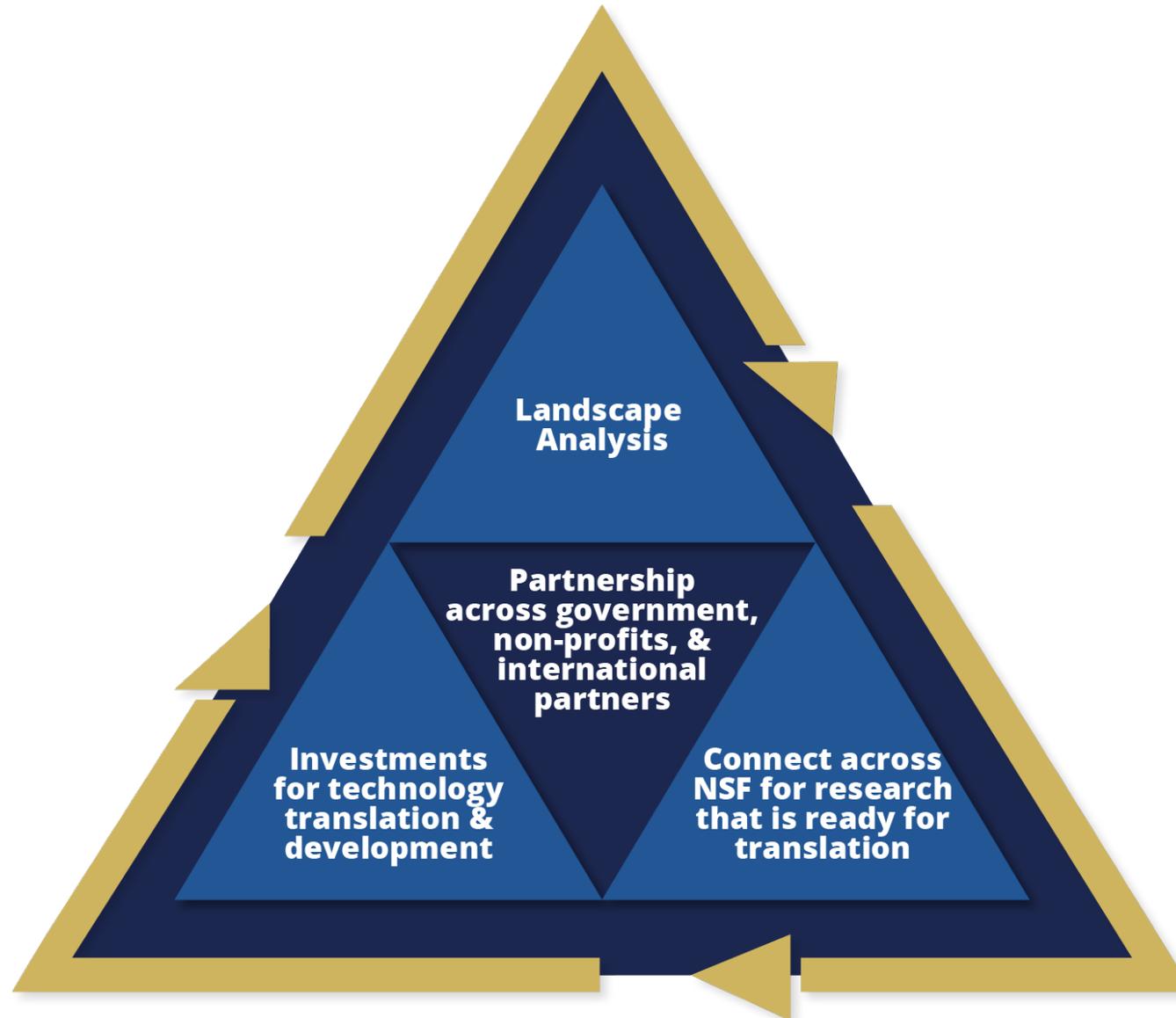
Assessments of the key technology areas will be conducted every three years by updating the TIP roadmap, informing the directorate's plans for staging investments for maximal effect on U.S. competitiveness.

Learn more at:

<https://new.nsf.gov/tip/updates/nsf-announces-investment-roadmap-technology>



# Emerging Tech Philosophy



# Initial Key Tech Foci

**Breaking Low** Breaking the Low Latency Barrier for Verticals in Next-G Wireless Networks

*\$12 million, 2-year initiative.*

**PDaSP** Privacy-Preserving Data Sharing in Practice

*\$23 million, three track initiative.*

**USPRD** Use-Inspired Acceleration of Protein Design

*\$40 million, 3-year initiative.*

**CFIRE** Advancing Cell-Free Systems toward increased Range of Use-Inspired Applications

*\$40 million, 3-year initiative.*



For more information:

***<https://new.nsf.gov/funding/opportunities>***

# Example: PDaSP

## Privacy-Preserving Data Sharing in Practice (PDaSP)

advances privacy-enhancing technologies and promotes their use to solve real-world problems. This **\$23 million** investment, in partnership with Intel, VMware, FHWA, and NIST, will enhance the ability to privately share and analyze data for a range of use cases and applications.

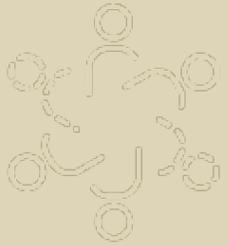
- 
- **Track 1:** Practical solutions; **\$500,000 - \$1 million**
  - **Track 2:** Integrated and comprehensive solutions spanning applications; **\$1 million - \$1.5 million**
  - **Track 3:** Tools and testbeds; **\$500,000 - \$1.5 million**



For more information:  
<https://new.nsf.gov/funding/opportunities/privacy-preserving-data-sharing-practice-pdasps/nsf24-585/solicitation>

# TIP's Three Pillars

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development

# America's Seed Fund (SBIR / STTR)

## NSF Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR)

provides more than **\$2 million** for deep tech startups to do feasibility assessment and transform scientific and engineering discoveries into products and services with commercial and societal impact.

---

Submit a Project Pitch to get started!

### PHASE I

6-12 months

Up to

**\$305,000**

### PHASE II

2 years

Up to

**\$1.25 million**

### PHASE IIB

Up to

**\$500,000**



CHIPS and  
Science Act  
2022

 **America's  
SEED FUND**  
SBIR.STTR

Opportunity available to:

 **Small Business**

# SBIR / STTR Fast-Track Pilot

## NSF Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Fast-Track pilot

operates by requiring periodic reviews that can unlock more than \$2 million per project, reducing administrative burden for both small businesses and NSF.

To be eligible, projects must be based on NSF-funded research in the last 5 years.

Submit a Project Pitch to get started!

### PHASE I / PHASE II

2-3 years, cooperative agreement

**\$400,000 / \$1,155,000**

### PHASE IIB

Supplement

**\$500,000**



**CHIPS and  
Science Act  
2022**

 **America's  
SEED FUND**  
SBIR.STTR

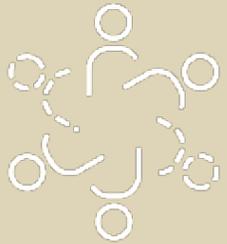
## FAST-TRACK

Opportunity available to:

 **Small Business**

# TIP's Three Pillars

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development

## NSF and Department of Commerce partner to advance semiconductor workforce development

NSF and the U.S. Department of Commerce (DOC) signed a memorandum of understanding to jointly invest in a new initiative to train the future semiconductor workforce at all levels for myriad job types across industry and the nation.

- NSF and DOC issued a public Request for Information (RFI) seeking input from the community to inform the new initiative.
- Check back soon!



Read the RFI at:

<https://sam.gov/opp/8d7e7a3885484323ae6852081adb98e2/view#description>

## NSF Research Traineeship Institutional Partnership Pilot (NRT-IPP)

program offers graduate students in research-based master's and doctoral degree programs at non-R1 institutions the opportunity to develop the skills, knowledge, and competencies needed to pursue a range of STEM careers by stimulating collaborations with other NRT awardee institutions and industry partners.

The program aims to develop sustainable programmatic capacity for STEM workforce training at the lead institutions in specific tech focus areas.

---

**\$4.5 million**, up to 5 years



For more information visit:

**<https://new.nsf.gov/funding/opportunities/national-science-foundation-research-traineeship-0>**

## NSF publishes Dear Colleague Letter: Research Coordination Network for a University-Community Climate Action Network (RCN-UCCAN)

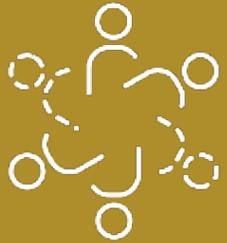
An NSF-led partnership with the U.S. Department of Energy (DOE) will work to establish a strategic leadership network on climate action engagement aimed at the transition from the linear economy of today to a circular economy of tomorrow, including one that will better integrate university research and community needs.

Up to two years for **up to \$2 million**

Learn more: <https://www.nsf.gov/pubs/2024/nsf24115/nsf24115.jsp>

# TIP's Three Pillars

TIP advances U.S. competitiveness and societal impact by nurturing partnerships that drive and accelerate:



Diverse Innovation Ecosystems



Technology Translation and Development



Workforce Development

# TIP INVESTMENT PILOT



1

VIEW BY

Key Technology Area

TIP Program

Artificial Intelligence



Advanced Computing and Semiconductors



Quantum Information Science and Technology



Robotics and Advanced Manufacturing



Disaster Prevention and Mitigation



AWARDS\*

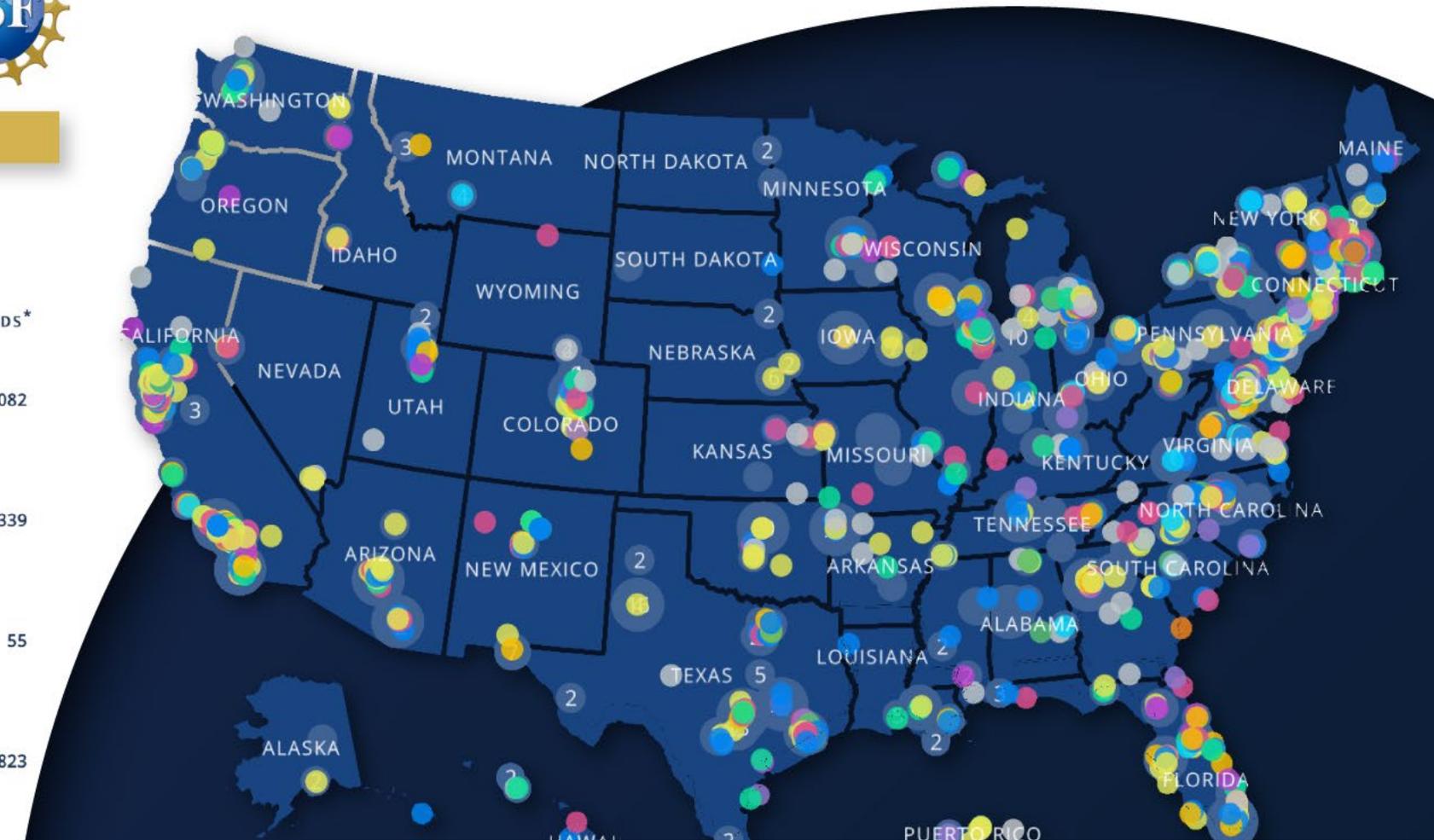
1,082

339

55

823

84



<https://new.nsf.gov/tip/data>

# By State/Congressional District



Reset Help

Filter

AWARDS  
**539**

LOCATED IN  
**California**

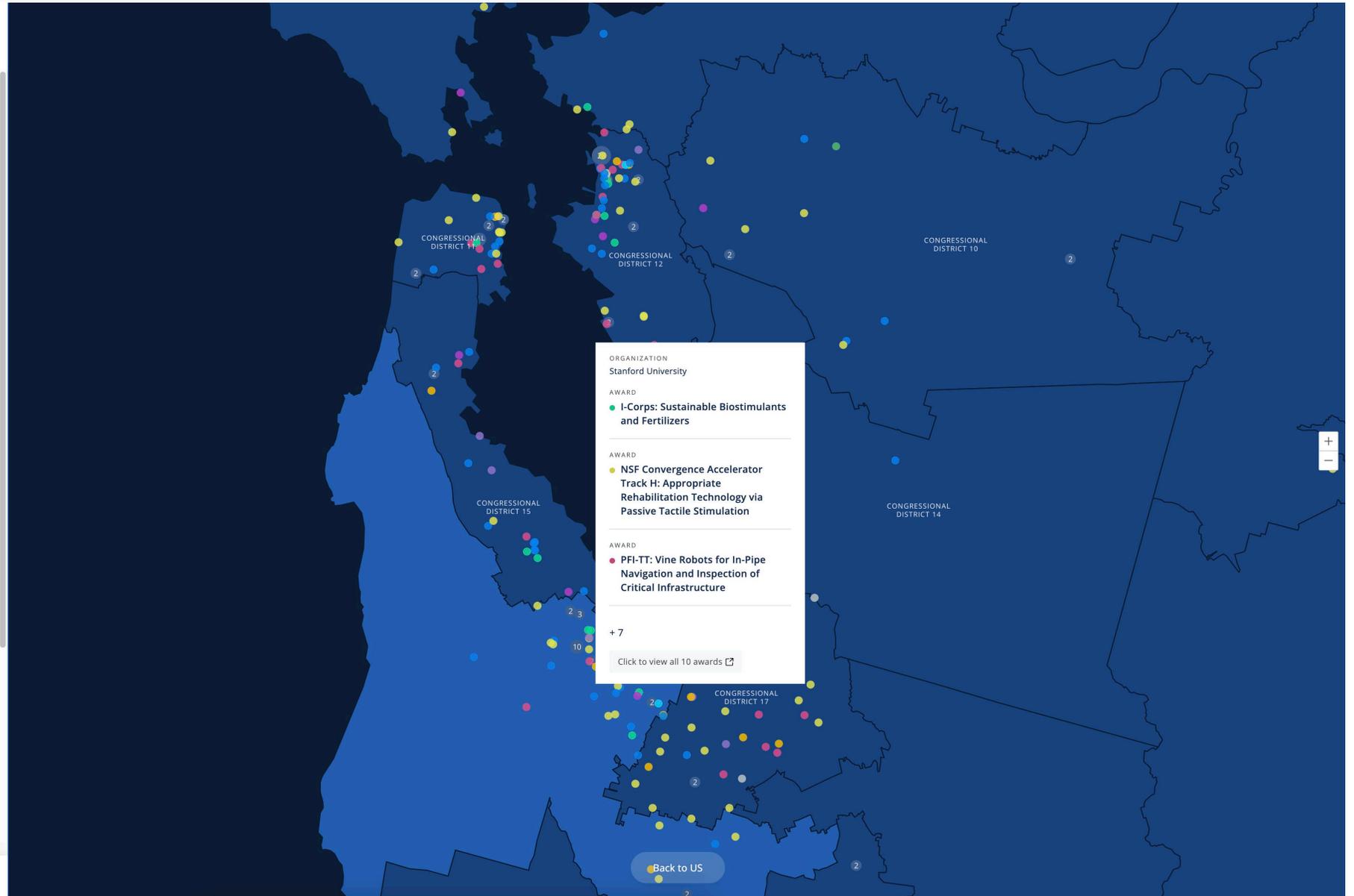
VIEW BY

Key Technology Area

TIP Program



Learn more about 539 awards in California



# By Program - ExLENT



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

Reset Help

Filter

AWARDS: **48** LOCATED IN: **US**

VIEW BY:

- Key Technology Area
- TIP Program

FOSTERING DIVERSE INNOVATION ECOSYSTEMS

Program	AWARDS*	INVESTMENT**
Convergence Accelerator (CA)	200	\$368.2M
Enabling Partnerships to Increase Innovation Ca...	94	\$37.8M
Regional Innovation Engines (NSF Engines)	68	\$207.1M

GROWING TALENT AND RESOURCE DEVELOPMENT

Entrepreneurial Fellows	1	\$20M
Experiential Learning for Emerging and Novel ...	48	\$37.1M



# Search TIP-funded Organizations

About Awards **Organizations** Principal Investigators

## Find TIP Awards by Organization



[Advanced search](#)

[< Search in all content](#)

### Filters for Organizations

#### Type

- State (1)
- Congressional District (24)
- Company (58)
- Institution (4)
- Higher Education (9)

#### United States

- California
- New York
- Massachusetts
- Texas
- Florida

[Show more >](#)

#### Congressional District at Award

- District n. 07 of Massachusetts
- District n. 12 of California

SELECTED FILTERS [CLEAR ALL](#)

UNITED STATES

Florida [x](#)

1 - 50 out of 96 results

Name (ascending) >



[Export search results](#)

Show as

**Grid**

[Hierarchy](#)

### AALMV INC.

Congressional District n. 14 of Florida  
Organizational unit: Company

### ACTUALIZATION AI LLC

Congressional District n. 15 of Florida  
Organizational unit: Company

### AEROSSENS, LLC

Congressional District n. 27 of Florida  
Organizational unit: Company

### AI-NEOTECH LLC

Congressional District n. 25 of Florida  
Organizational unit: Company

### AMERICAN MAGNET CO LLC

Congressional District n. 05 of Florida  
Organizational unit: Company

### BOTELMOT RESEARCH LLC

Congressional District n. 06 of Florida  
Organizational unit: Company

### Canaery, Inc.

Congressional District n. 03 of Florida  
Organizational unit: Company

### Capacitech Energy, Inc

Congressional District n. 10 of Florida  
Organizational unit: Company

### CHIBITRONICS INC.

Congressional District n. 12 of Florida  
Organizational unit: Company

### CIRCULATECH LLC

### CLAUDIUS LEGAL

### CL CHEMICAL COMPANY

# Find Your Opportunities



## Academia

- America's Seed Fund powered by NSF
- Accelerating Research Translation
- Convergence Accelerator
- Enabling Partnerships to Increase Innovation Capacity
- Experiential Learning for Emerging and Novel Technologies
- NSF Entrepreneurial Fellowships
- NSF Innovation Corps (I-Corps™)
- Partnerships for Innovation
- Pathways to Enable Open-Source Ecosystems
- Privacy-Enhancing Technologies Prize Challenge
- Prototype Open Knowledge Network
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies



## Business & Industry

- America's Seed Fund powered by NSF
- Convergence Accelerator
- Experiential Learning for Emerging and Novel Technologies
- Pathways to Enable Open-Source Ecosystems
- Pathways to Enable Open-Source Ecosystems
- Privacy-Enhancing Technologies Prize Challenge
- Prototype Open Knowledge Network
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies



## Government

- Convergence Accelerator
- Experiential Learning for Emerging and Novel Technologies
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies
- Visionary interdisciplinary Teams Advancing Learning Prize Challenge



## Nonprofits

- Convergence Accelerator
- Experiential Learning for Emerging and Novel Technologies
- Partnerships for Innovation
- Pathways to Enable Open-Source Ecosystems
- Prototype Open Knowledge Network
- NSF Regional Innovation Engines
- Responsible Design, Development, and Deployment of Technologies
- Visionary interdisciplinary Teams Advancing Learning Prize Challenge

## Translational Accelerators

### New Partnerships For Innovation



### Test Beds

**LAB**

Foundational  
Research

Use Inspired  
Research

Proofs of  
Concept

Prototype  
Development

Product/Solution  
Development

National and  
Societal Impact

**SOCIETY**

 [Find Funding & Apply](#) ▾[Manage Your Award](#) ▾[Focus Areas](#) ▾[News & Events](#) ▾[About](#) ▾

[Home](#) / [Career Opportunities](#) / [Current Job Openings](#)

Get Vacancies Updates by [Email](#) or by [RSS](#).

## Current Job Openings

---

# Director, Division of Innovation and Technology Ecosystems

---

**Check:** <https://new.nsf.gov/careers/openings>

# Meeting this Moment

Bolster our **national security** against emerging threats

Re-establish and defend **America's legacy** as the world's leader in science and technology

Train an innovation-ready **American workforce** ready to globally compete and win in the emerging technology sectors that will define the global economy

Reinvigorate the U.S. **industrial innovation base** and accelerate economic development and job creation across the nation—from America's Heartland to the Sun Belt



# Learn About TIP

## Funding opportunities

---

## Sign up for our newsletter

---

## Resources and upcoming events

---

**Learn More:**  
[new.nsf.gov/tip/latest](https://new.nsf.gov/tip/latest)

## Technology, Innovation and Partnerships

A new directorate at the U.S. National Science Foundation

 [View image credit](#)

[Home](#) / [Directorate for Technology, Innovation and Partnerships \(TIP\)](#) / [Latest](#)

One year ago, under the leadership of Director Sethuraman Panchanathan, the U.S. National Science Foundation announced the establishment of the Directorate for Technology, Innovation and Partnerships, or TIP, the agency's first new directorate in more than 30 years.

Just a few months later, Congress passed the "CHIPS and Science Act," authorizing the establishment of the directorate and charging it with the critical mission of advancing U.S. competitiveness through investments that accelerate the development of key technologies and address pressing societal and economic challenges.

---

### Updates

[NSF invests more than \\$43 million in NSF Regional Innovation Engines Development Awards](#)

May 11, 2023

[NSF seeks input on novel approaches to emerging technology career pathways](#)

### › Learn More About TIP

- [More About TIP](#)
- [TIP Resources](#)
- [Funding Opportunities](#)
- [Broad Agency Announcements](#)
- [Stay Informed with our Newsletter](#)
- [TIP Leadership](#)
- [TIP Staff](#)
- [Careers](#)

### › TIP Programs

- [Accelerating Research Translation](#)



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

## Questions?

- Email [tip@nsf.gov](mailto:tip@nsf.gov)
- Visit <https://new.nsf.gov/tip/>