



ADVANCING TECHNOLOGY, INNOVATION AND PARTNERSHIPS ACROSS THE U.S.

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Deputy Assistant Director for Technology, Innovation and Partnerships

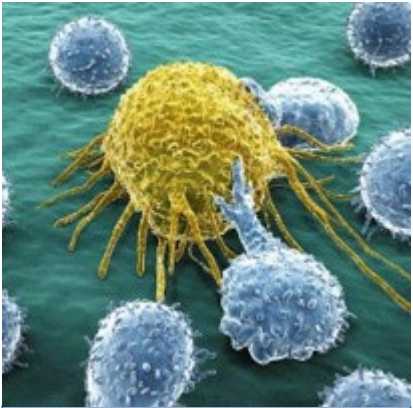
Government-University-Industry Research Roundtable Meeting

June 29, 2022

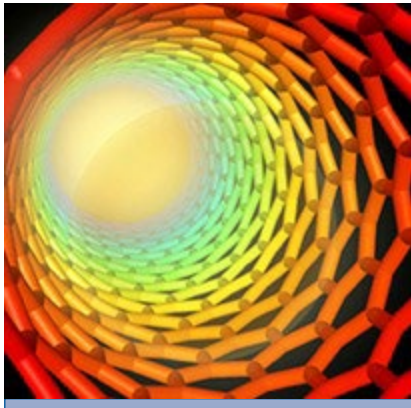
NSF mission



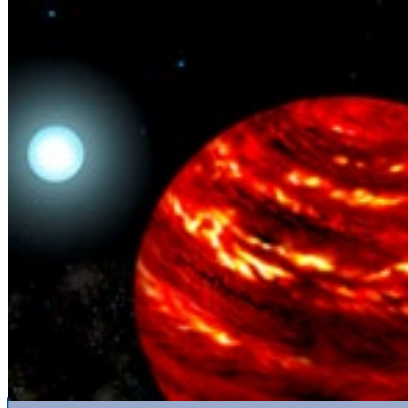
NSF directorates and offices



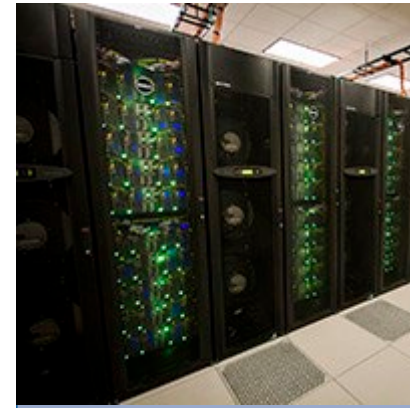
Biological Sciences



Engineering



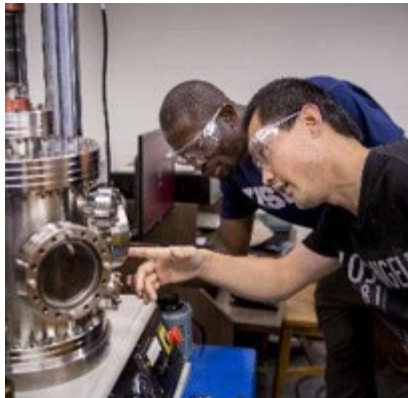
Mathematical & Physical Sciences



Computer & Information Science & Engineering



Geosciences (including Polar Programs)



Integrative Activities



Education & Human Resources



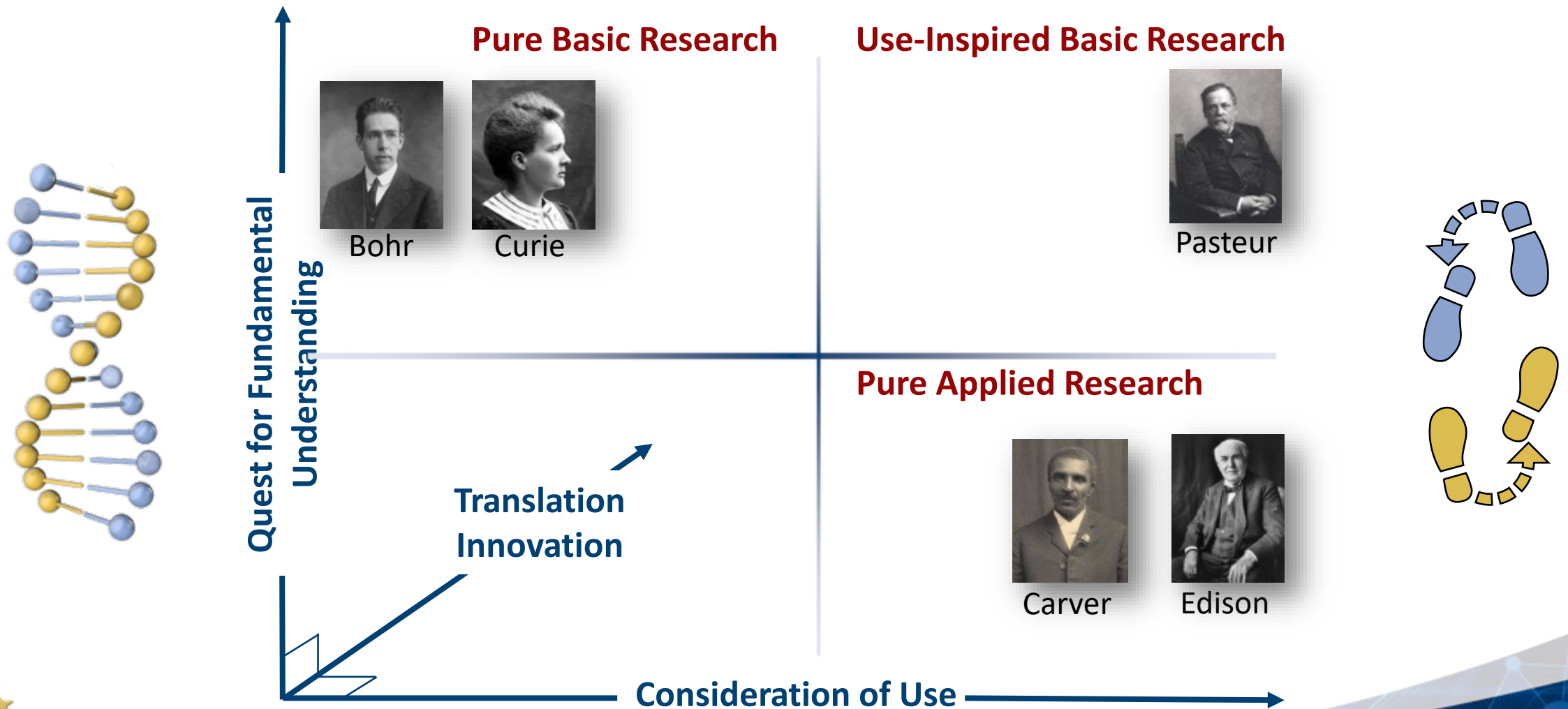
Social, Behavioral & Economic Sciences



International Science & Engineering



The spectrum of research





**CURIOSITY-DRIVEN,
DISCOVERY-BASED
EXPLORATIONS**

The Milky Way's Black Hole



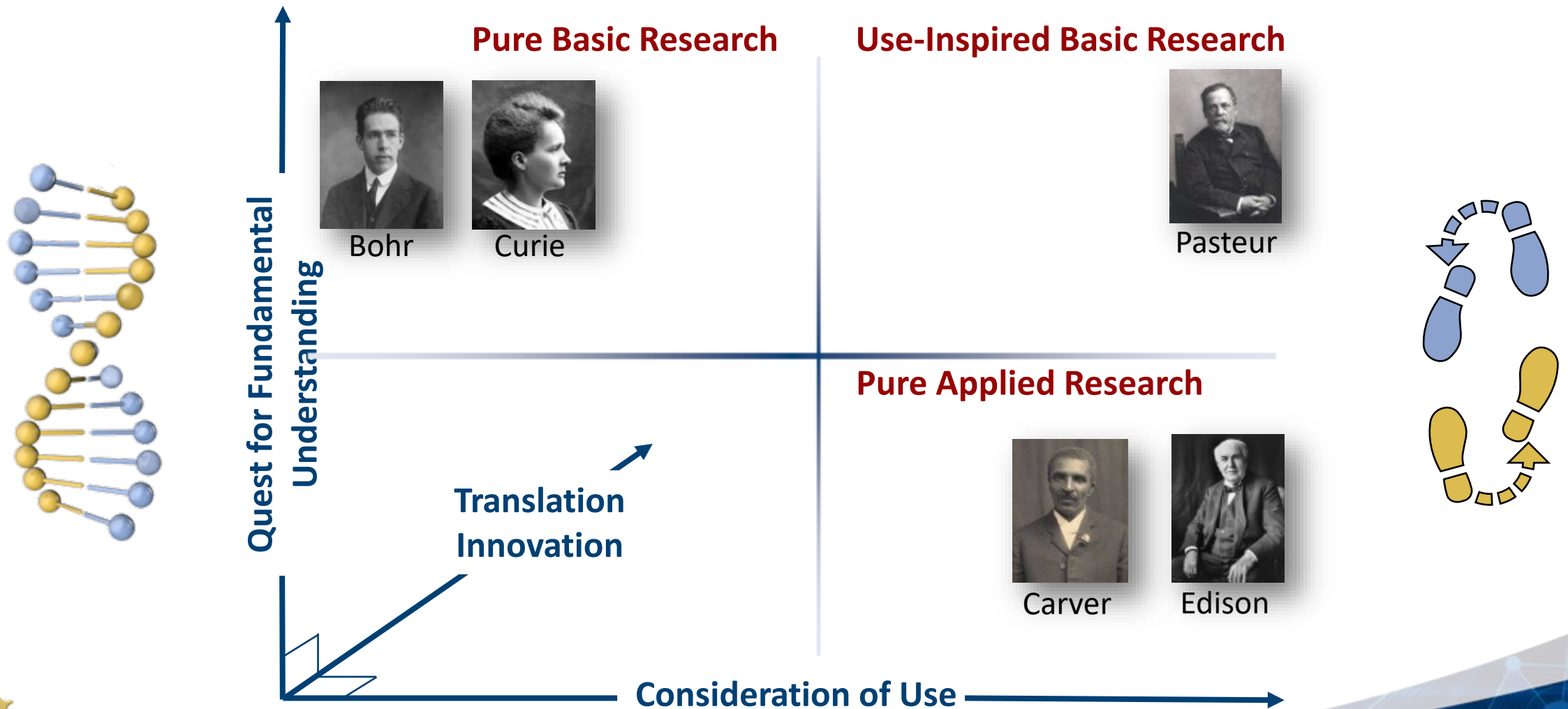
COVID-19 Response



**USE-INSPIRED,
SOLUTIONS-FOCUSED
INNOVATIONS**



The spectrum of research



A pivotal moment



Climate change

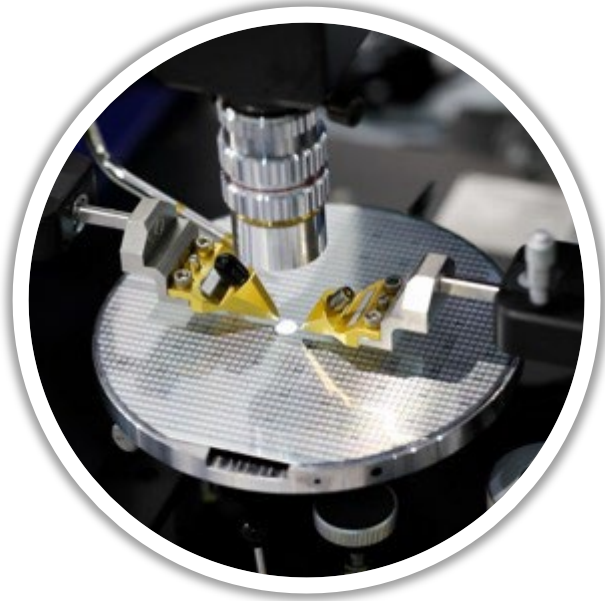


Equitable access to
education, health care



Critical and resilient
infrastructure

A changing science and engineering enterprise



Pace of discovery
accelerated by data,
emerging technologies

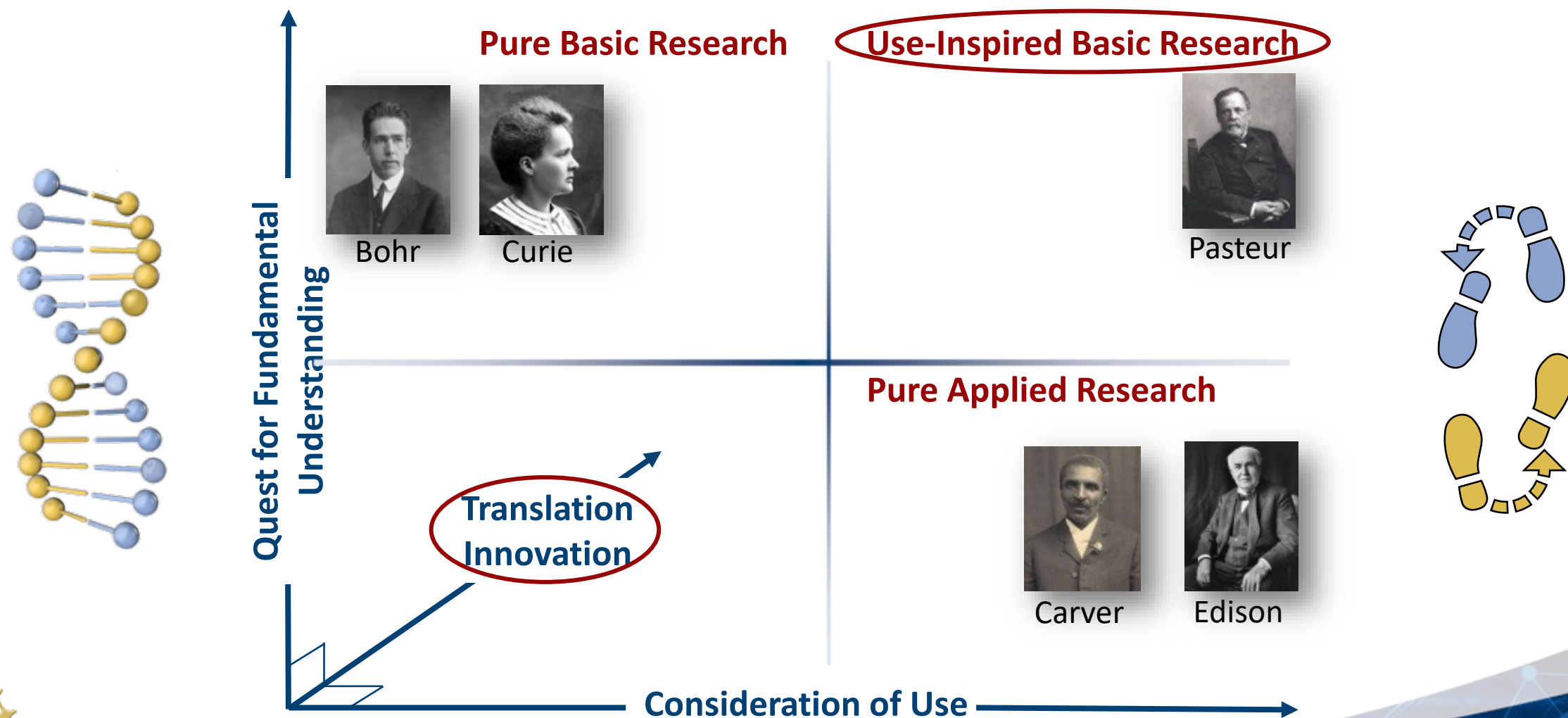


Demand for
societal impact



Opportunity to leverage
partnerships

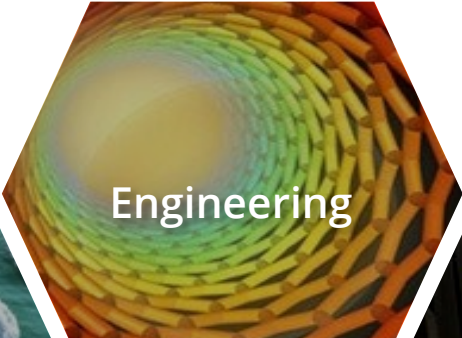
Meeting this moment with an intentional focus



NSF's existing directorates and offices



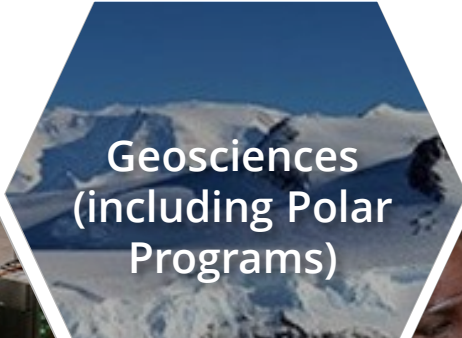
A new “horizontal” to enhance use-inspired and translational research



Engineering



Computer & Engineering

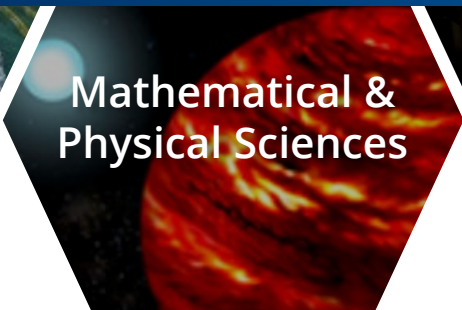


Geosciences
(including Polar Programs)



Social, Behavioral & Economic Sciences

DIRECTORATE FOR TECHNOLOGY, INNOVATION AND PARTNERSHIPS (TIP)



Mathematical & Physical Sciences



Integrative Activities



International Science & Engineering



TIP: A paradigm shift

Today

- Largely investigator-driven
-
- Primarily academic research teams
-
- Stream of discoveries improve prosperity, resilience, quality of life



TIP: A paradigm shift

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- Stream of discoveries improve prosperity, resilience, quality of life

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



TIP: A paradigm shift

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- Stream of discoveries improve prosperity, resilience, quality of life

“Technology / supply push”



Tomorrow

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“Market / demand pull”



March 16, 2022: NSF establishes TIP

“TIP is a critical first step that will accelerate the development of new technologies and products that improve Americans' way of life, grow the economy and create new jobs, and strengthen and sustain U.S. competitiveness for decades to come.”

News Release 22-002

NSF establishes new Directorate for Technology, Innovation and Partnerships

Meet TIP – Technology, Innovation and Partnerships

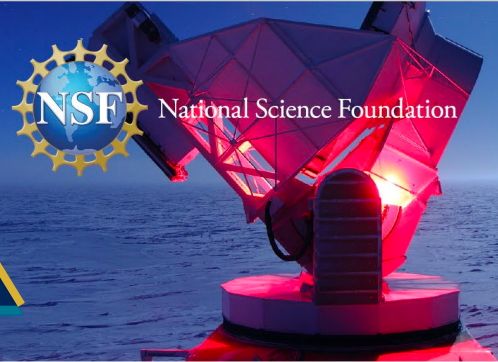
A new directorate at the U.S. National Science Foundation



FY 2023 President's Budget Request

\$10.492 billion
+19% over FY 2022 Enacted

FY2023 BUDGET REQUEST
TO CONGRESS



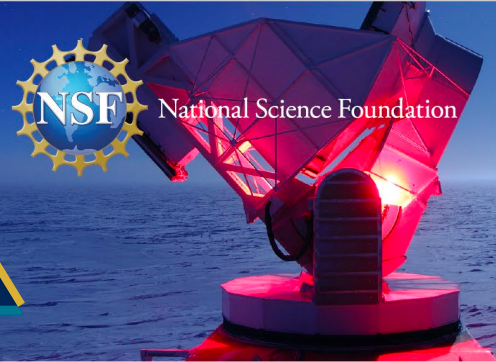
Investments in the Administration's priorities of responding to the pandemic, tackling climate change, spurring economic recovery, innovating for equity, and ensuring national security and economic resilience.



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THE DIRECTORATE FOR TECHNOLOGY, INNOVATION,
AND PARTNERSHIPS (TIP)
\$879.87 million



ADVANCED MANUFACTURING
\$421.51 million



ADVANCED WIRELESS
\$168.56 million



ARTIFICIAL INTELLIGENCE
\$734.41 million



BIOTECHNOLOGY
\$392.26 million



MICROELECTRONICS AND SEMICONDUCTORS
\$145.69 million



QUANTUM INFORMATION SCIENCE
\$261.0 million



Partnerships as a Foundation

Accelerate Partnerships



Partnerships: A timely, illustrative example

Intel to Invest at Least \$20 Billion in New Chip Factories in Ohio

Building up U.S. chip production has been a focus of lawmakers and companies alike amid a global shortage of the crucial components.



“To help develop and attract a pipeline of skilled talent from within the region, Intel plans to invest approximately \$100 million over the next decade in partnership with Ohio universities, community colleges and the U.S. National Science Foundation [ranging] from collaborative research projects to building semiconductor-specific curricula for associate and undergraduate degree programs.”



“Significant investments such as this one will allow us to harness the best ideas from around the country to drive future semiconductor design and manufacturing as well as develop a diverse, next-generation semiconductor workforce, reaffirming U.S. competitiveness in this vital area. Today’s announcement builds on our long history of collaboration with industry like Intel to accelerate fundamental research and rapidly bring solutions to market.”

- Sethuraman Panchanathan
U.S. National Science Foundation Director



Innovation & Technology Ecosystems

Convergence Accelerator

Emerging Technologies

Regional Innovation

Experiential &
Entrepreneurial Learning

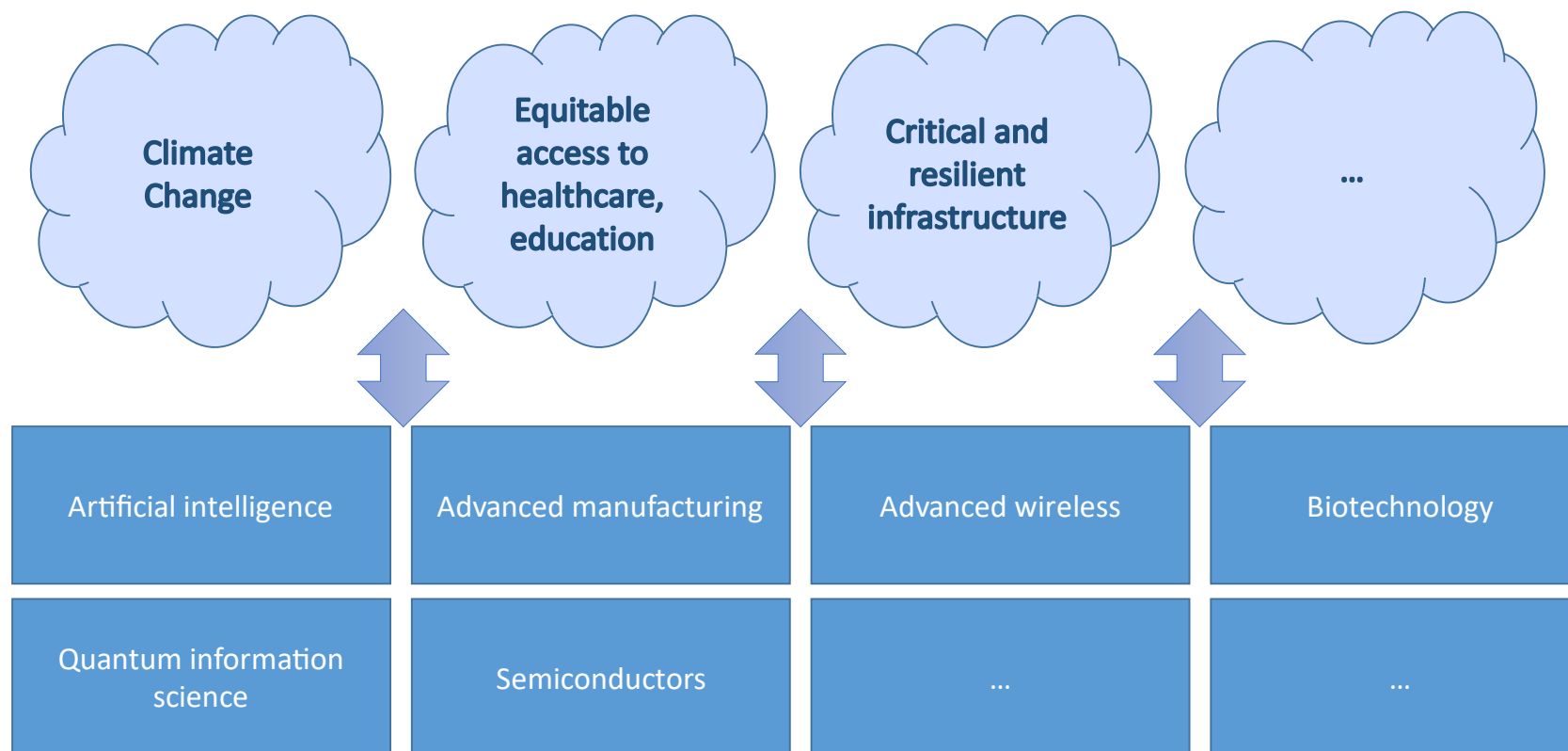
Partnerships as a Foundation

Accelerate Partnerships



NSF Regional Innovation Engines (NSF Engines)

- Cultivate new regional innovation ecosystems throughout the U.S.
- Address major scientific/technological goals while solving societal challenges
- Balance technical and geographic innovation

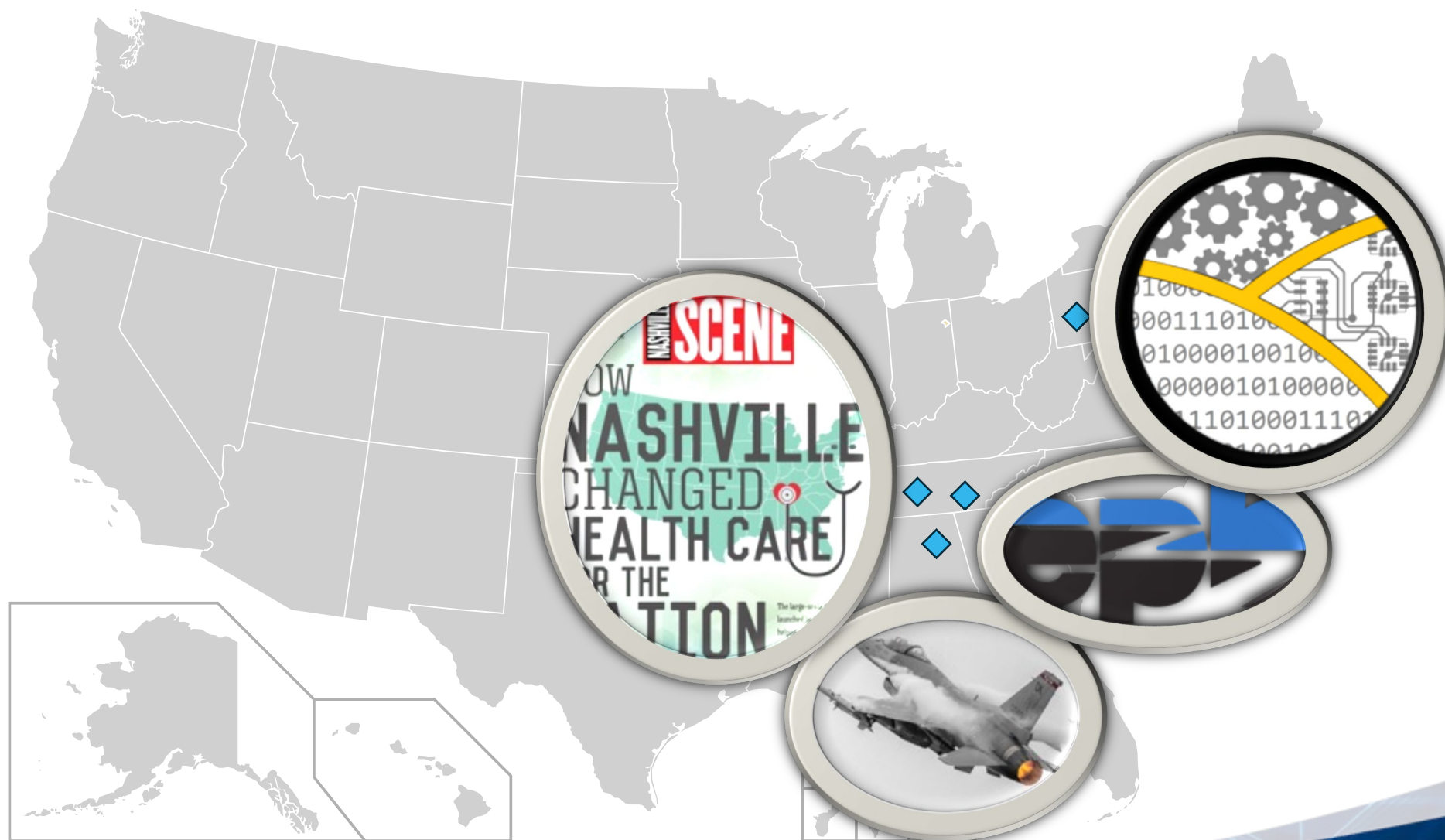


NSF Engines: An intentionally different approach

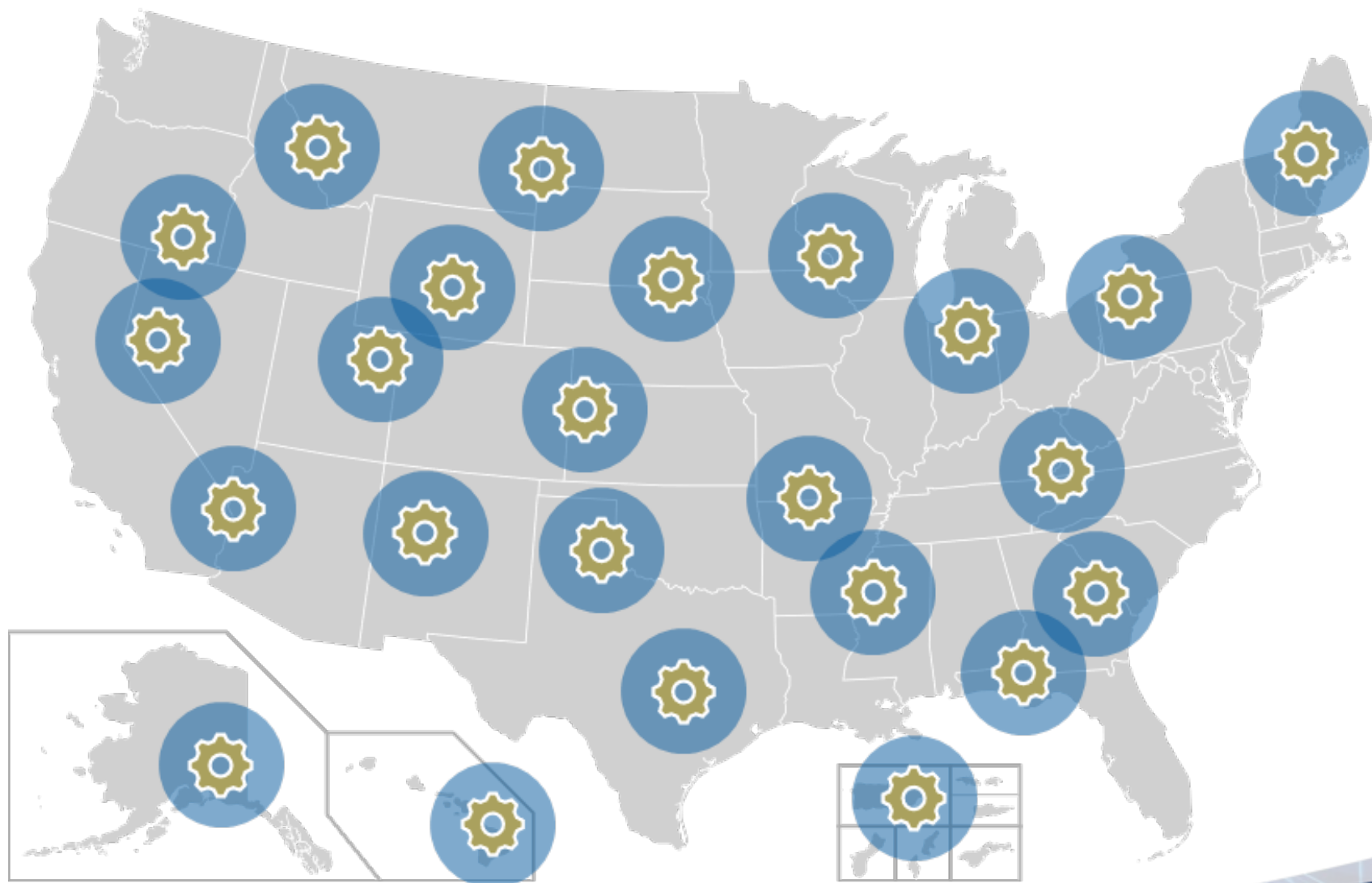
- A different scale
- Iterative co-design/co-creation through intentional engagement of broad, diverse stakeholders (“users”)
- Cohort-based training + evaluation of the overall approach
- Milestone requirements for continued funding
- Focused success expectations:
 - Regional development
 - Individual and geographic diversity, including mentoring
 - Scaling and sustainability
 - Active participation and engagement
 - IP ownership extends to all contributing parties
 - Changing culture
 - Practitioner/entrepreneur development
 - Integrative/additive



NSF Engines: Expanding innovation throughout the US



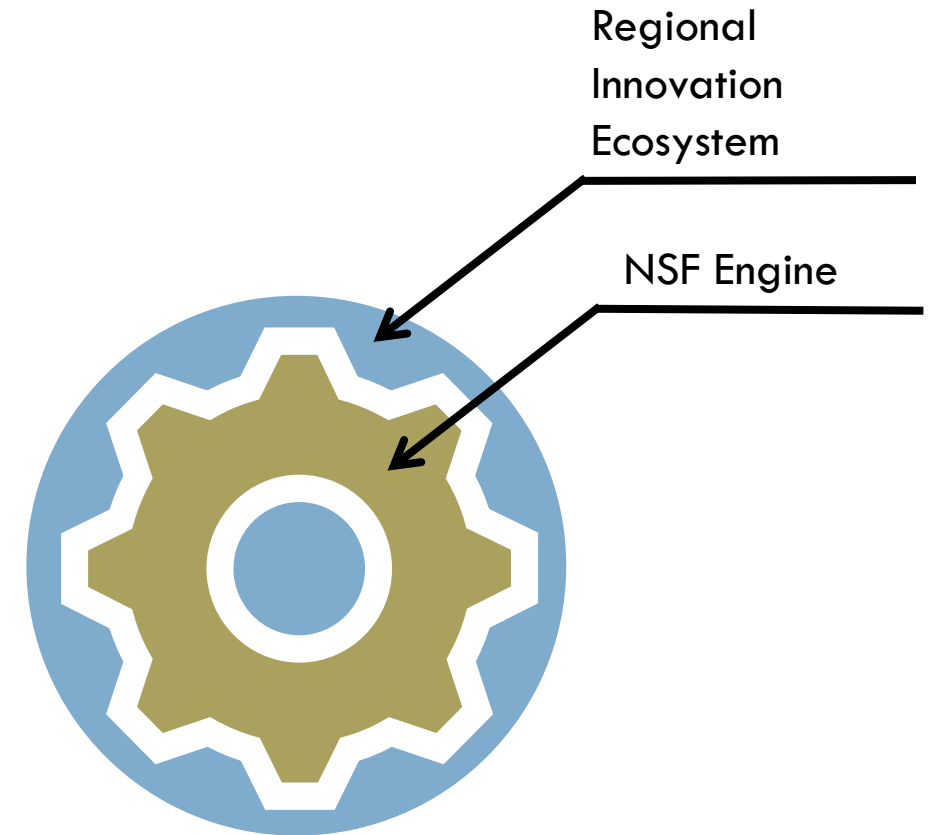
NSF Engines: Expanding innovation throughout the US



What is an NSF Engine?

A multi-sector coalition of regional partners working together to catalyze a regional innovation ecosystem in a topic area of regional relevance and national and societal significance.

Engines are led by CEOs and includes partners from industry, institutions of higher education, government, and non-profit and community organizations.



Innovation & Technology Ecosystems

Convergence Accelerator

Emerging Technologies

Regional Innovation

Experiential &
Entrepreneurial Learning

Partnerships as a Foundation

Accelerate Partnerships



Technology Translation

I-Corps

PFI

SBIR/STTR

Innovative Pathways

Innovation & Technology Ecosystems

Convergence Accelerator

Emerging Technologies

Regional Innovation

Experiential &
Entrepreneurial Learning

Partnerships as a Foundation

Accelerate Partnerships





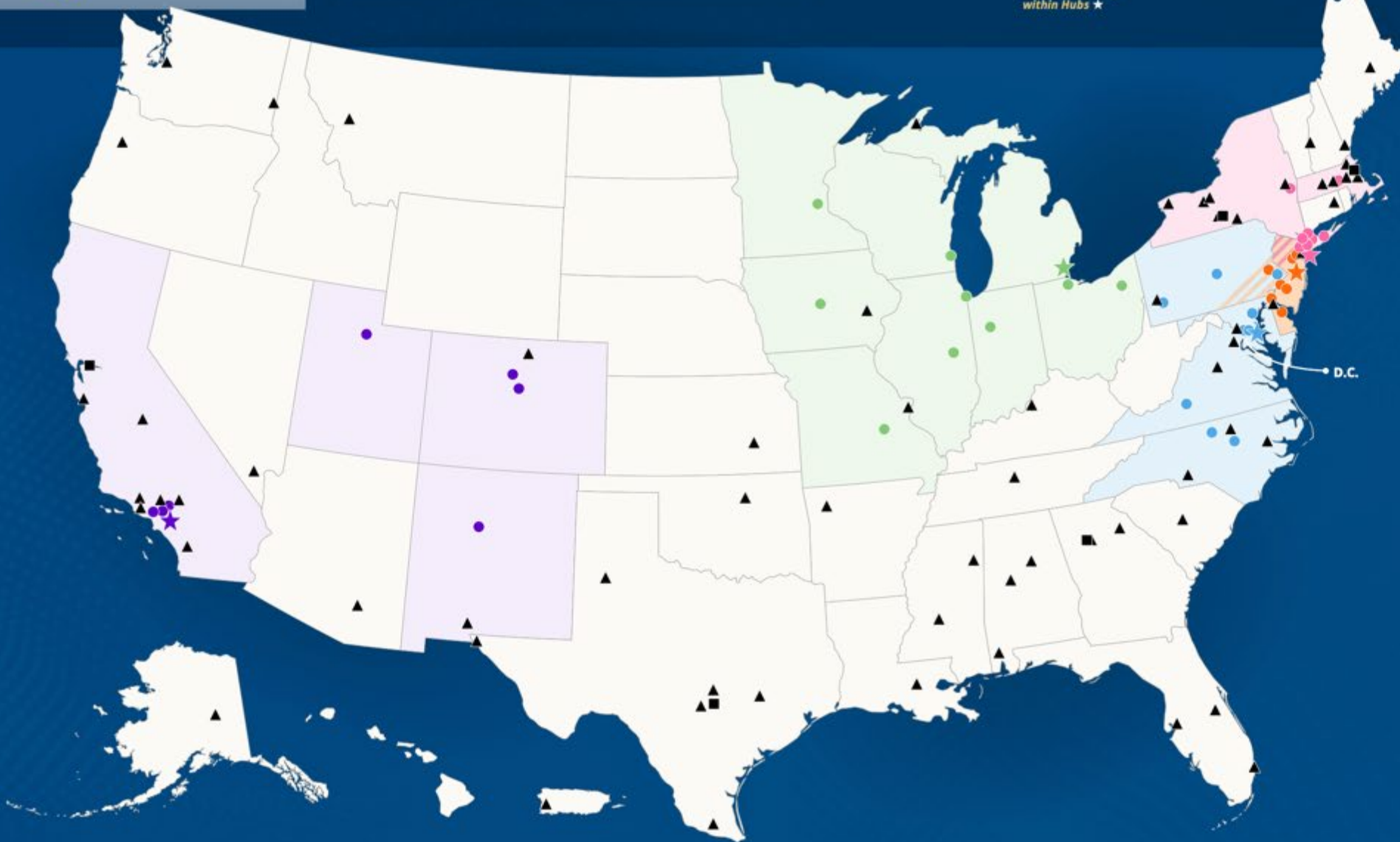
NATIONAL INNOVATION NETWORK – I-CORPS™

The National Innovation Network is a network of universities, NSF-funded researchers, established entrepreneurs, local and regional entrepreneurial communities, and other federal agencies that help researchers learn how to translate fundamental research to the marketplace.



This is an interactive graphic. Hover your cursor over the colored rectangles to the right and the key below to display more information. In order to view the interactive features of this PDF, please download and open in Acrobat.

Hubs ● **Sites** ▲ **Nodes** ■
Lead Institutions within Hubs ★



HUBS, AUGUST 2021

GREAT LAKES REGION

University of Michigan ★
Iowa State University
Missouri University of Science & Technology
Purdue University
The University of Akron
University of Chicago
University of Illinois Urbana-Champaign
University of Minnesota Twin Cities
The University of Toledo
University of Wisconsin-Milwaukee

MID-ATLANTIC REGION

University of Maryland College Park ★
Carnegie Mellon University
The George Washington University
Howard University
Johns Hopkins University
North Carolina State University
Pennsylvania State University
University of North Carolina Chapel Hill
University of Pennsylvania
Virginia Tech

NEW YORK REGION

The City University of New York ★
Columbia University
Icahn School of Medicine at Mount Sinai
New York University
Rockefeller University
Stevens Institute of Technology
Stony Brook University
University at Albany
University of Massachusetts Medical School

NORTHEAST REGION

Princeton University ★
Delaware State University
Lehigh University
New Jersey Institute of Technology
Rutgers University
Rowan University
Temple University
University of Delaware

WEST REGION

University of Southern California ★
California Institute of Technology
Colorado School of Mines
University of California, Los Angeles
University of California, Riverside
University of Colorado Boulder
The University of New Mexico
The University of Utah

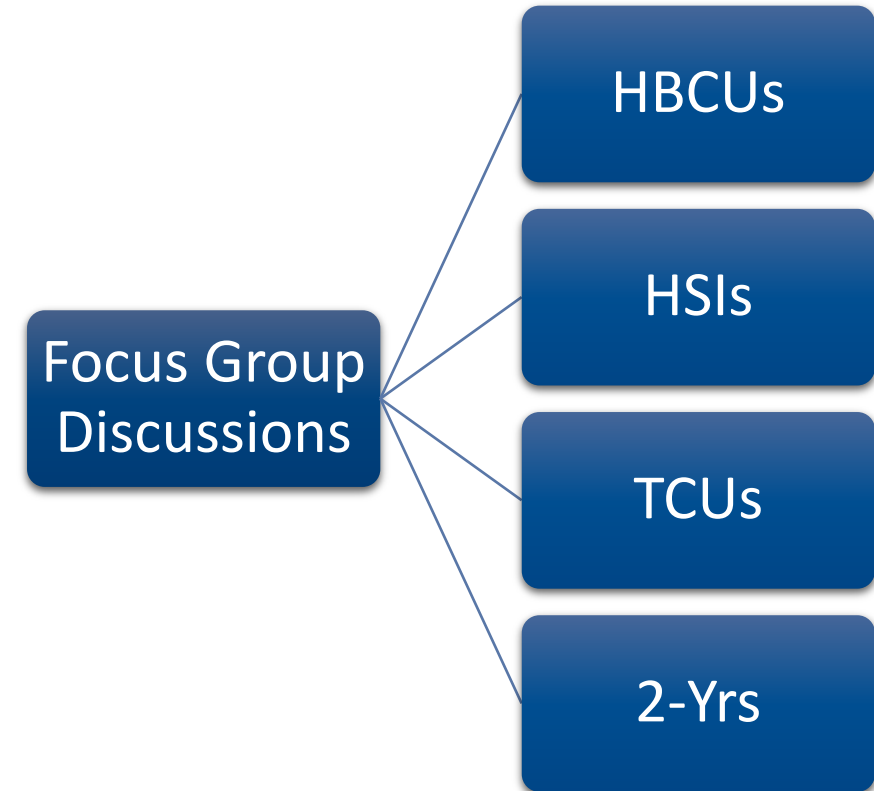
“Designing in” DEIA

GOAL:

To ensure the successful inclusion of minority-serving institutions, two-year institutions, and other academic institutions underrepresented in the NSF portfolio in the NSF Engines program.

OBJECTIVES:

1. Emphasize the essential role that MSIs will play in realizing the mission of the NSF Engines
2. Gather insight from participating institutions about how they can benefit from and best contribute to the NSF Engines
3. Address the questions, concerns, and challenges about engaging in the NSF Engines, or TIP more generally



259 participants
143 different organizations



“Designing in” DEIA



Challenges to building strong **partnerships**



Need for **capacity building** at small institutions



Issues related to **NSF policy**



Challenges due to **geographic isolation**



The value of **mentoring**

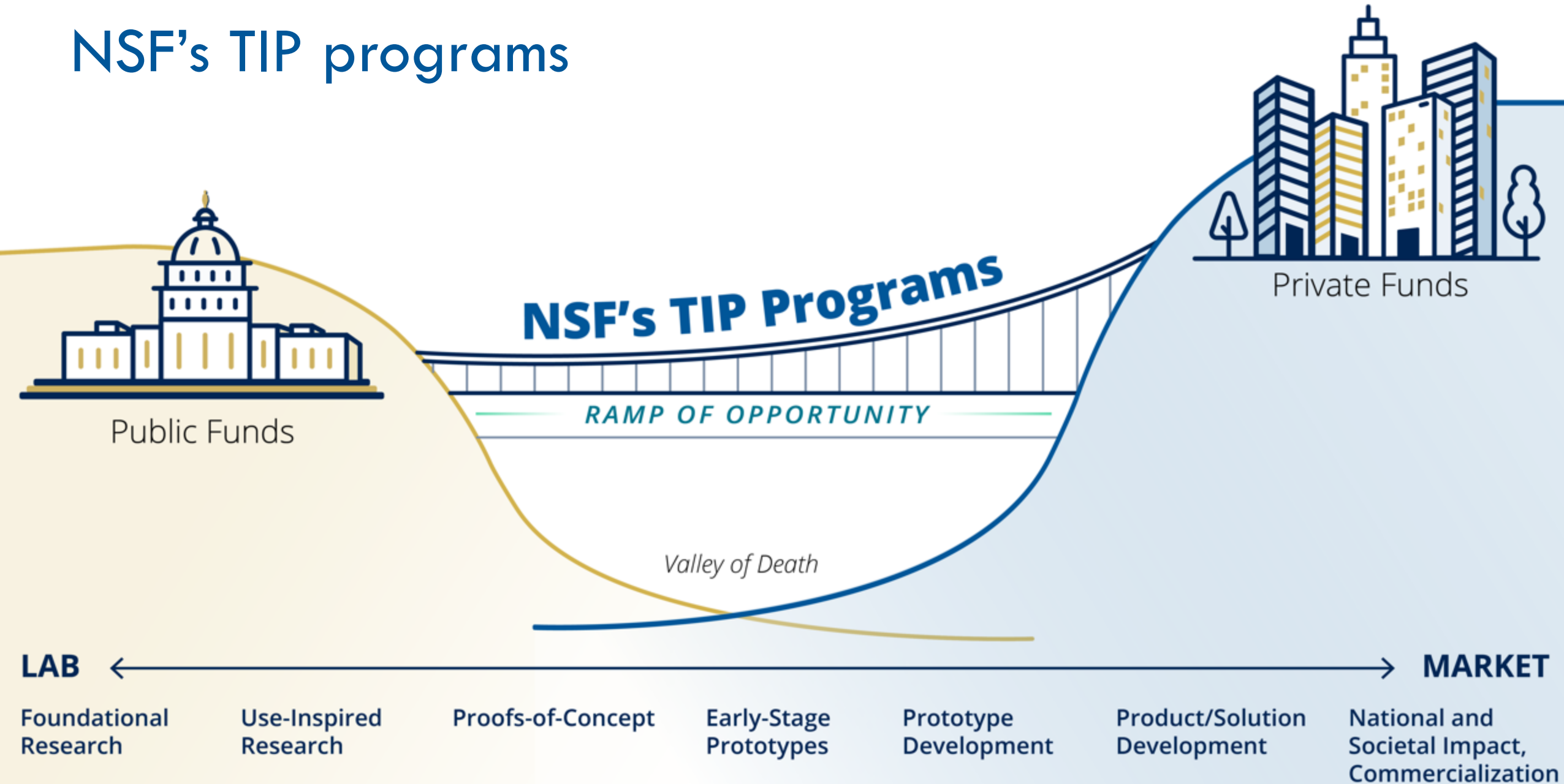


TIP status

- Launched in March 2022
- Re-positioned existing programs, planning new investments
- Initiating recruiting



NSF's TIP programs



TIP Technology, Innovation and Partnerships

<https://beta.nsf.gov/tip/latest>

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