

Accelerating Research to Impact

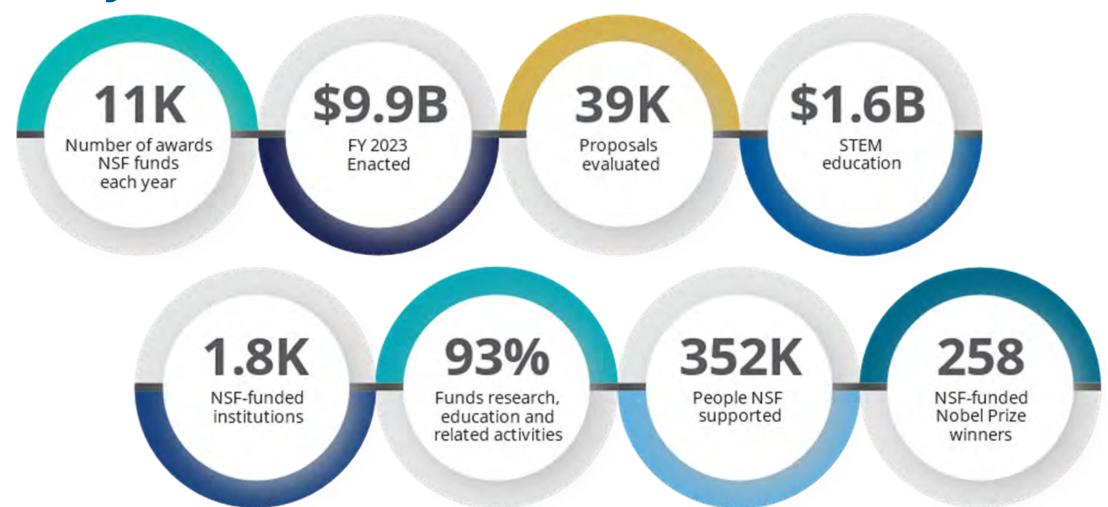
Allen Walker
Senior Advisor
Directorate for Technology, Innovation and Partnerships

ERC Industry Liaison Group May 17, 2023 alwalker@nsf.gov

NSF Mission



NSF by the Numbers



Today's agenda

- Inspiration, vision
- Mission, functions, program
- Status



Changing landscape









Pressing socioeconomic challenges



Changing climate

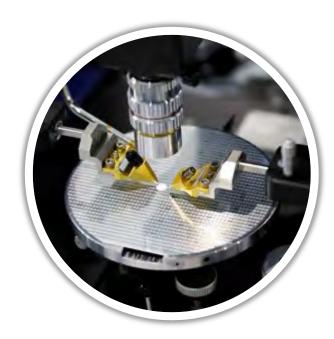


Equitable access to education, health care



Critical and resilient infrastructure

Evolving research and innovation ecosystem



Pace of discovery accelerated by data, emerging technologies



Demand for societal impact



Opportunity to leverage partnerships

NSF's existing directorates and offices





A new "horizontal" to enhance use-inspired and translational research



DIRECTORATE FOR TECHNOLOGY, INNOVATION AND PARTNERSHIPS (TIP)





TIP's 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.

TIP: Accelerating research to impact



Fostering Innovation and Technology Ecosystems

Nurtures regional and national innovation and technology ecosystems to support researchers and innovators.



Establishing Translation Pathways

Supports startups through a lab-to-market platform and establishes new pathways for translating research results.



Partnering to Engage the Nation's Diverse Talent
Advances and deepens public and private partnerships across all areas of science, engineering and education.

TIP: Accelerating research to impact



Fostering Innovation and Technology Ecosystems

Nurtures regional and national innovation and technology ecosystems to support researchers and innovators.



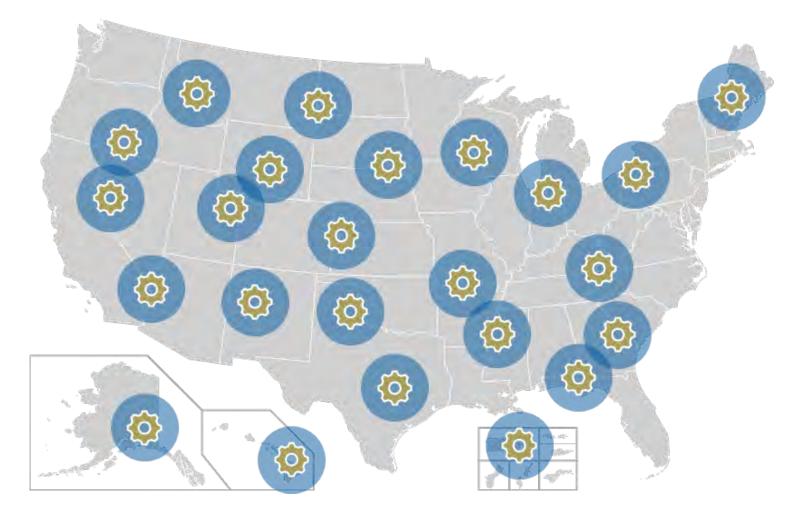
Establishing Translation Pathways

Supports startups through a lab-to-market platform and establishes new pathways for translating research results.



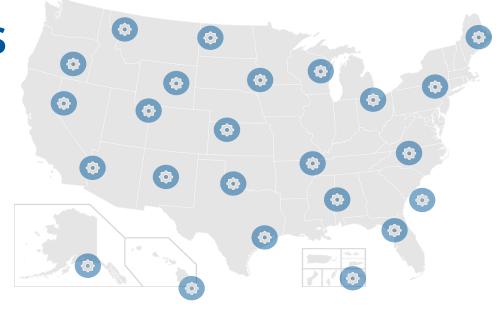
Partnering to Engage the Nation's Diverse Talent
Advances and deepens public and private partnerships across all areas of science, engineering and education.

Expanding innovation across the US



NSF Regional Innovation Engines

Supports the development of diverse, regional coalitions to engage in use-inspired research, drive research results to the market and society, promote workforce development, and ultimately stimulate the economy and create new jobs.



NSF Engines are funded up to \$160 million for up to 10 years

NSF Engine Development Awards - up to \$1 million for up to 2 years to plan for an Engine. (Awards coming soon!)



NSF ENGINES

Search (i)

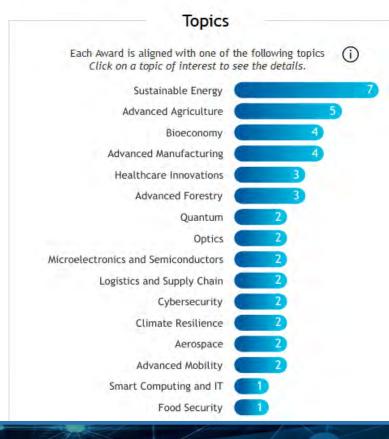


(6) 44 NSF Engines Development Awards

Hover over each Engine icon to see the details.



The first-ever NSF Engines Development Awards will help regional partners collaborate to advance key technologies, address societal challenges, and create economic opportunities. The awards to 44 unique teams span universities, nonprofits, business and other organizations across U.S. states and territories.





Concept Outlines Explorer

Theme Count Control

Search By Theme (and more)

Search By State [Overview [

and Null values

10 to 103

Blockchain Diversity Clean Energy Aerospace

Search All

?

NSF Engines Type

State Name

Submission Organization

Submission ID

Keywords (free text)

States Footpring (using state abbreviation)

Submission Theme

Transportation

Blue Economy Resilience Entrepreneurship Inclusion Water

Agriculture Advanced Materials Innovation Cybersecurity

Robotics Rural Community Economic Development Autonomy Workforce Development Battery Sustainability

Carbon Reduction Advanced Manufacturing Energy Artificial Intelligence

Coastal Resilience Bioeconomy Environment Health Semiconductors Disaster And Emergency Response Climate Change Food Renewable Energy Technology

Supply Chain Community Resilience Equity Internet Of Things
Quantum Data Analytics

Digital Health Wireless Broadband Infrastructure Workforce Circular Economy Mobility Automation

Number of Submissions:

ID	NSF Engines Type	Submission Title	Organization Name	Last Name	Region Of Service	States	Topic Summary	Keywords	
INQ-22-00640	Type 1 Proposal	Bridging the Gap in the Digi	XLerateHealth	Willmot	The region of service	KY,WV,SC	The Engine proposes to ca	virtual care,digital health,access,equity,southeast	⊠
INQ-22-00925	Type I Proposal	Carbon-negative cementitiou	Worcester Polytechnic Ins	Eggleston	New England	MA	The Engine proposes to cr	carbon negative, construction material, polysiloxanes, additive manufacturing, in	
INQ-22-00907	Type I Proposal	NSF Engines: Type-1: A Ga	Worcester Polytechnic Ins	Smith	Southern New Engla	MA,RI,CT	The Engine proposes the i	Null	
INQ-22-00636	Type 1 Proposal	ICoN: Integrative Connectivit	Worcester Polytechnic Ins	Wyglinski	New England (CT, M	CT,MA,ME,	The Engine proposes to o	connectivity,integrative,new england,wireless,workforce development	
INQ-22-00491	Type 1 Proposal	NSF Engines: Type-1: WPI –	Worcester Polytechnic Ins	Woolridge	Central MA, the sout	MA	The engine proposes to w	biotech manufacturing,tech workforce development,biomedical ecosystem,bio	
INQ-22-01119	Type I Proposal	A statewide innovation engin	WiSys	Sanga	WI	WI	The Engine proposes to w	agriculture, sustainability, technology, commercialization, startup	
INQ-22-00444	Type 2 Proposal	NSF Engines: Type-2: Advan	Wichita State University	Tomblin	Kansas with a focus	KS	The Engine proposes to e	artificial intelligence,machine learning,hypersonics,lightning	
INQ-22-00457	Type 1 Proposal	NSF Engines: Type-1: West	Western Michigan Univer	Atilhan	Western Michigan	MI	The Engine proposes to w	per- and polyfluoroalkyl substances,pfas,wastewater,environment,remediation	
INQ-22-00712	Type 1 Proposal	"Al3 West Living Laboratory	Western Maricopa Coalit	Hoffman	The Greater Phoenix	AZ	The Engine proposes to le	artificial intelligence,robotics,cognitive applications,health technology,fintech	
INQ-22-00326	Type 2 Proposal	NSF Engines: Type-2: Using	Western Kentucky Univer	Brown	South, the Midwest,	KY	The Engine proposes lever	$a iot, a gritech, commercialization, urban\ economic\ development, rural\ economic\$	
INQ-22-00981	Type 2 Proposal	NSF Engines: Type 2: Resear	Western Fire Chiefs Asso	Van Ballego	Western United Stat	CA,CO,W	The Engine proposes to bu	wildland fire,wildland fire urban interface (wui),community resilience,western	

Data Source: NSF Engines Concept Outline Submissions | Data As Of: 07/28/2022 | Disclaimer

INO 22 00085 Type I Proposal Pural Community Dovelopme Western Colorado Univer



Convergence Accelerator

Convergence Accelerator multidisciplinary teams use convergence research fundamentals and innovation processes to stimulate innovative idea sharing and development of sustainable solutions.

PHASE I (PLANNING):

Up to \$750,000 over 9 months

PHASE II (IMPLEMENTATION):

Up to \$5 Million over 24 months

IDEATION PHASE 1 PHASE 2 SOCIETAL IMPACT

Convergence Research Focus

Convergence Accelerator



Track A

Open Knowledge Networks



Track B

Al and the Future of Work



Track C

Quantum Technology



Track D

Al-Innovation
Data Sharing &
Modeling



Track E

Networked Blue Economy



Track F

Trust & Authenticity in Communication
Systems

2019 COHORT

Phase 2



Phase 2



Phase 1



Track G

Securely Operating Through 5G Infrastructure (joint with DOD)



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

FUTURE COHORT

TIP: Accelerating research to impact



Fostering Innovation and Technology Ecosystems

Nurtures regional and national innovation and technology ecosystems to support researchers and innovators.



Establishing Translation Pathways

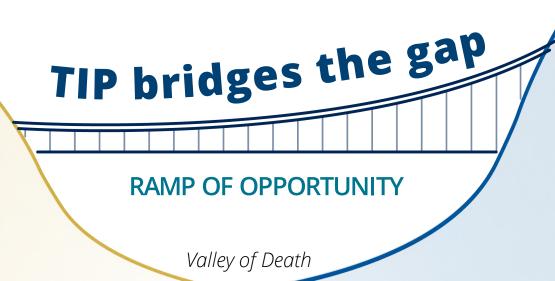
Supports startups through a lab-to-market platform and establishes new pathways for translating research results.



Partnering to Engage the Nation's Diverse Talent
Advances and deepens public and private partnerships across all areas of science, engineering and education.

NSF programs power technology breakthroughs







LAB

Foundational Research

Use-Inspired Research

Proofs-of-Concept

Prototype Development

Product/Solution Development

National and Societal Impact, Commercialization

SOCIETY



America's Seed Fund (SBIR/STTR)

Up to ***2 Million** in R&D funding for startups to develop transformative, deep tech, high-impact technologies

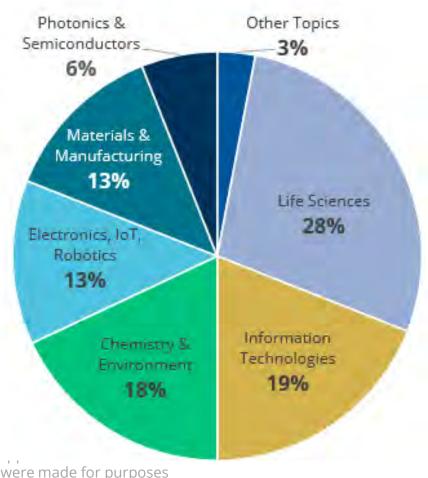
Phase I6-12 months
Up to **\$275,000**

Phase II
2 years
Up to \$1M

Phase IIB
Up to
\$500,000

 Get started any time at seedfund.nsf.gov/apply





^{*} Funding amount reflects total dollars obligated on SBIR/STTR awards and s _ _ _ 2020. This amount excludes 1) the SBIR/STTR admin fund, 2) any award that were made for purposes other than funding small businesses, and 3) awards and supplements that have been cancelled



Partnerships for Innovation (PFI)

- Translational research toward proof-of-concept of a future product, process or service.
- For researchers with NSF funding
- Two Tracks:
 - Technology Translation

2 years up to \$550,000

Research Partnerships (industry partner required)

https://beta.nsf.gov/funding/initiatives/pfi

3 years up to \$1 million

Innovation Corps (I-Corps™)



- Spur translation of fundamental research to the marketplace.
- Train NSF-funded faculty, students, and other researchers in innovation and entrepreneurship skills.

Reach

I-Corps Hubs
involving nearly 100
universities

40+ University Sites & Nodes



Outputs

5,800 Individuals trained since 2012

1,000⁺ Startups created



Pathways to Enable Open-Source Ecosystems (POSE)

Harnesses the power of open-source development for the creation of new technology solutions to:

- ensure more secure open-source products;
- increase coordination of developer contributions and
- a more focused route to impactful technologies.

Phase I – 1 year Up to \$300,000

Phase II – 2 years Up to \$1.5M

NSF ART: New \$60 million NSF program aims to grow speed, scale of research solutions





More information @ beta.nsf.gov/tip/latest

four years



• The Accelerating Research Translation, or ART program, will support institutions of higher education to build capacity and infrastructure to strengthen and scale the translation of basic research outcomes into impactful solutions.

TIP: Accelerating research to impact



Fostering Innovation and Technology Ecosystems

Nurtures regional and national innovation and technology ecosystems to support researchers and innovators.



Establishing Translation Pathways

Supports startups through a lab-to-market platform and establishes new pathways for translating research results.



Partnering to Engage the Nation's Diverse Talent
Advances and deepens public and private partnerships across all areas of science, engineering and education.

NSF Partners with Intel and Micron

JANUARY 2022

intel

NSF announces \$100 million partnership with Intel Corporation to support semiconductor design and manufacturing, and workforce development

NOVEMBER 2022



NSF announces \$10 million partnership with Micron to train and build a skilled semiconductor manufacturing workforce

NSF launches prize challenge to develop innovative learning technologies for K-12 students





The Visionary Interdisciplinary Teams
 Advancing Learning, or VITAL, Prize
 Challenge developed to encourage
 interdisciplinary teams from the science
 and engineering research and startup or
 small-business communities to advance
 innovative concepts into prototypes for
 potentially game-changing learning
 technologies.

NSF ExLENT: a workforce development program that opens new doors in emerging technology fields





More information @ beta.nsf.gov/tip/latest

Up to \$1 million over three years

• ExLENT program promotes partnerships between organizations in emerging technology fields and those with expertise in workforce development to expand practical learning opportunities for individuals interested in entering or gaining more experience in emerging and novel technology.



NSF launches entrepreneurial fellowship program for engineers and scientists



Activate

More information @ beta.nsf.gov/tip/latest

At least \$350,000 in direct support



- Supports researchers from a variety of backgrounds and geographies to move technologies from lab to society.
- Run by a non-profit, Activate.org, provides Activate Fellows supported by NSF with twoyears of training and at least \$350,000 in direct support, plus access to specialized research facilities and equipment.

TIP: Accelerating research to impact

Partnering to

Engage the

Nation's Diverse

Talent

Advances and deepens public and private partnerships across all areas of science, engineering and education.



Nurtures regional and national innovation and technology ecosystems to support researchers and innovators.

Establishing Translation Pathways Supports startups through a lab-to-market platform and establishes new pathways for translating research results.

Ramping Up TIP



IAN 21:

NSF + Intel announce \$100M semi. workforce partnership

JAN 2022



MAR 16:

TIP is established

MAR 2022



JUL 20:

JUL 2022

NSF, NIST, OSTP. **UK** announce privacy prize challenges



JUL 28:

NSF Engines Concept Outlines published



OCT 19:

NSF launches **ExLENT** program



OCT 27:

NSF + Micron announces \$10M semi. workforce partnership

IAN 26:

NSF announces cross-sector partnership with Ericsson, Intel, IBM and Samsung as part of its FuSe initiative



• NOV 10:

NSF announces winners in first phase of NSF, NIST, OSTP, UK privacy prize challenges



NOV 2022

• IAN 10:

NSF, NobleReach Emerge announce biotechnology investment



JAN 2023

• MAR 15: NSF launches Proto-OKN

MAR 2023

FEB 2022

FEB 15: Pathways to enable

Open-Source Ecosystems launches **MAY 2022**

MAY 3: 6

NSF Engines program launches SEP 2022

SEP 7: •

NSF, DOD partner to advance 5G security



SEP 19:

New Fellows program launches



SEP 8:



NSF awards 5 new I-Corps Hubs™

OCT 2022



NSF launches EPIIC • DEC 9:

DEC 12:

DEC 8: •

NSF announces Builder Platform for NSF Engines

DEC 19:

NSF invests \$12M to Circular Economy

DEC 2022

NSF invests \$12M on solutions for persons with disabilities

DEC 13:

NSF invests \$11M to address food/ nutrition insecurity FEB 2023

FEB 8:

NSF launches ART

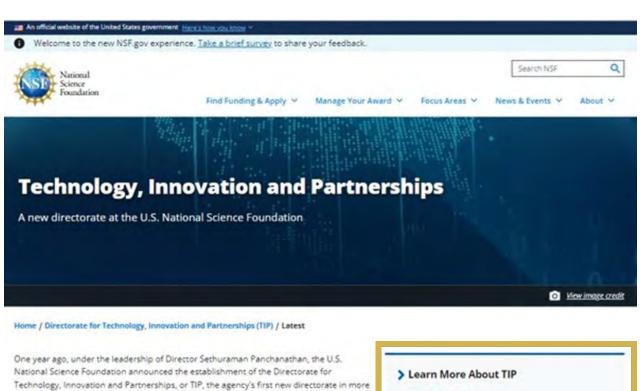




Learn about TIP

- Programs & funding opportunities
- Stay informed with our newsletter
- Resources and upcoming events
- Job opportunities

Visit new.nsf.gov/tip/latest



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.







NSF broadens participation in innovation ecosystems by supporting capacity building at institutions of higher education





\$Up to \$400,000 for three years

 The Enhancing Partnerships to Increase Innovation Capacity (EPIIC) program will provide training and networking support to help build more inclusive innovation ecosystems and pathway into NSF Engines.