

The Big Ideas in Context



F. Fleming Crim
Chief Operating Officer
National Science Foundation

EPSCoR Annual PI Meeting
May 16, 2019



NSF Mission

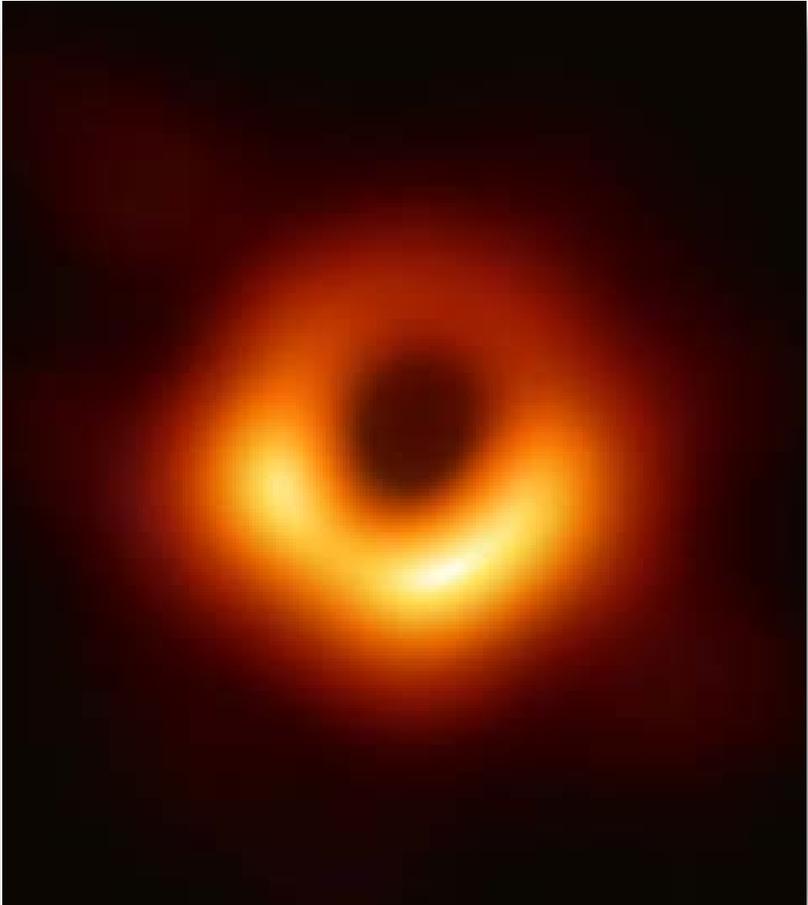
“To promote the progress of science;
to advance the national health, prosperity, and welfare;
to secure the national defense...”



National Science Foundation

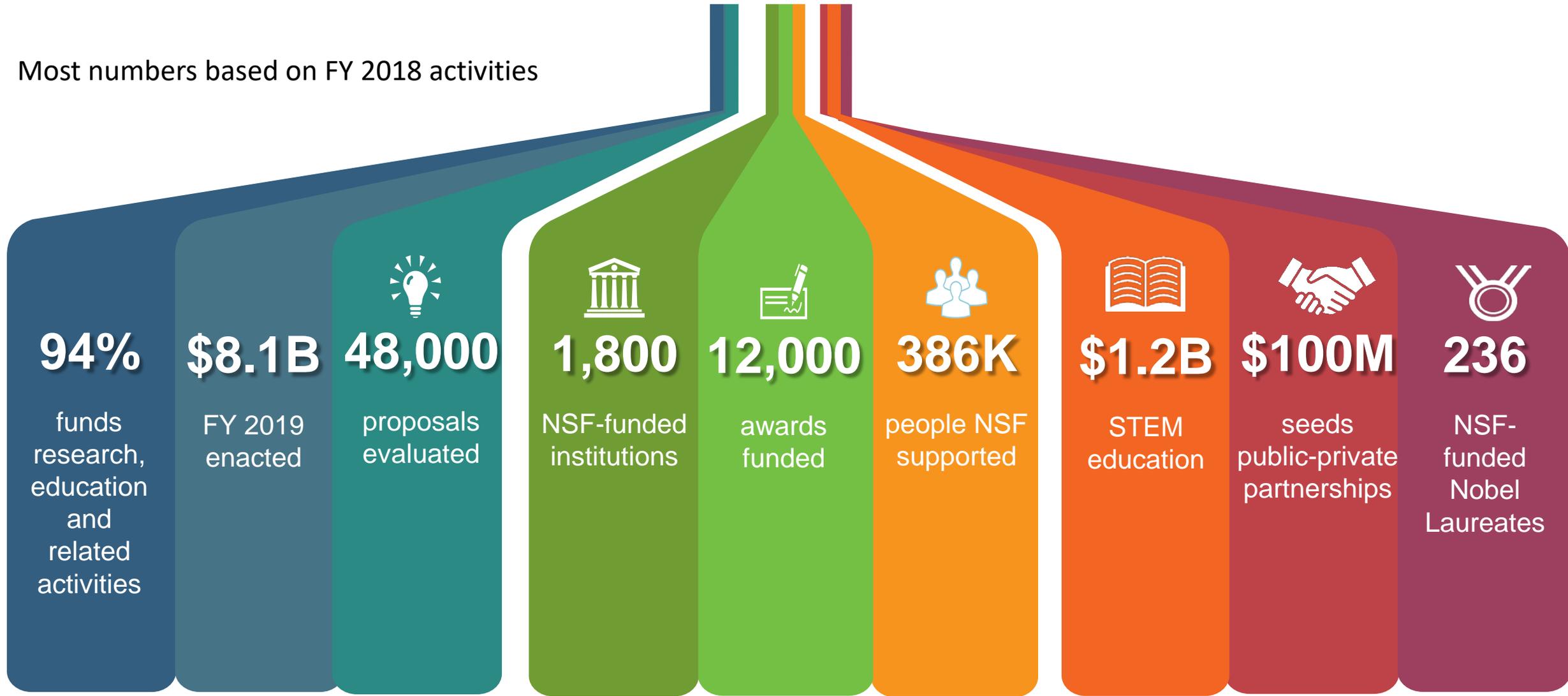


Image from the Event Horizon Telescope



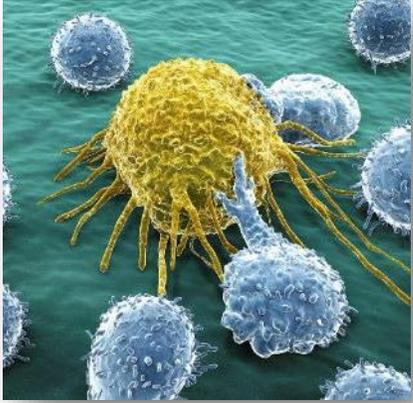
NSF by the Numbers

Most numbers based on FY 2018 activities

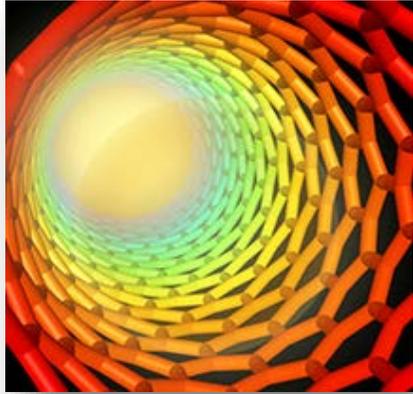


National Science Foundation

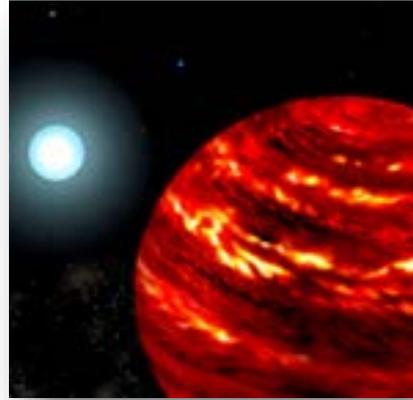
NSF Funds All Fields of Science and Engineering



Biological Sciences



Engineering



**Mathematical and
Physical Sciences**



**Computer and Information
Science and Engineering**



**Geosciences and
Polar Programs**



**Integrative
Activities**



**Education and
Human Resources**



**Social, Behavioral, and
Economic Sciences**

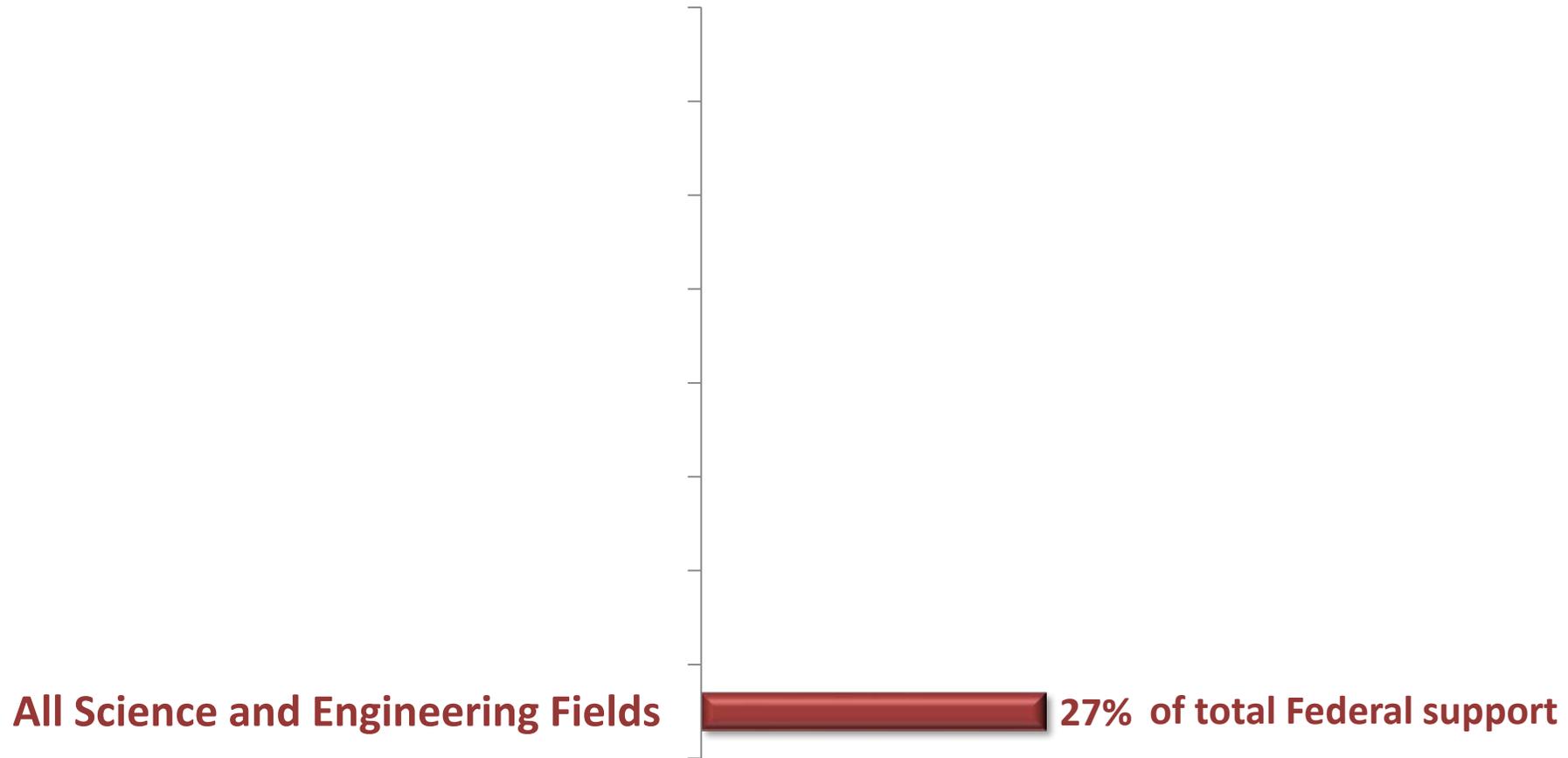


**International Science
and Engineering**

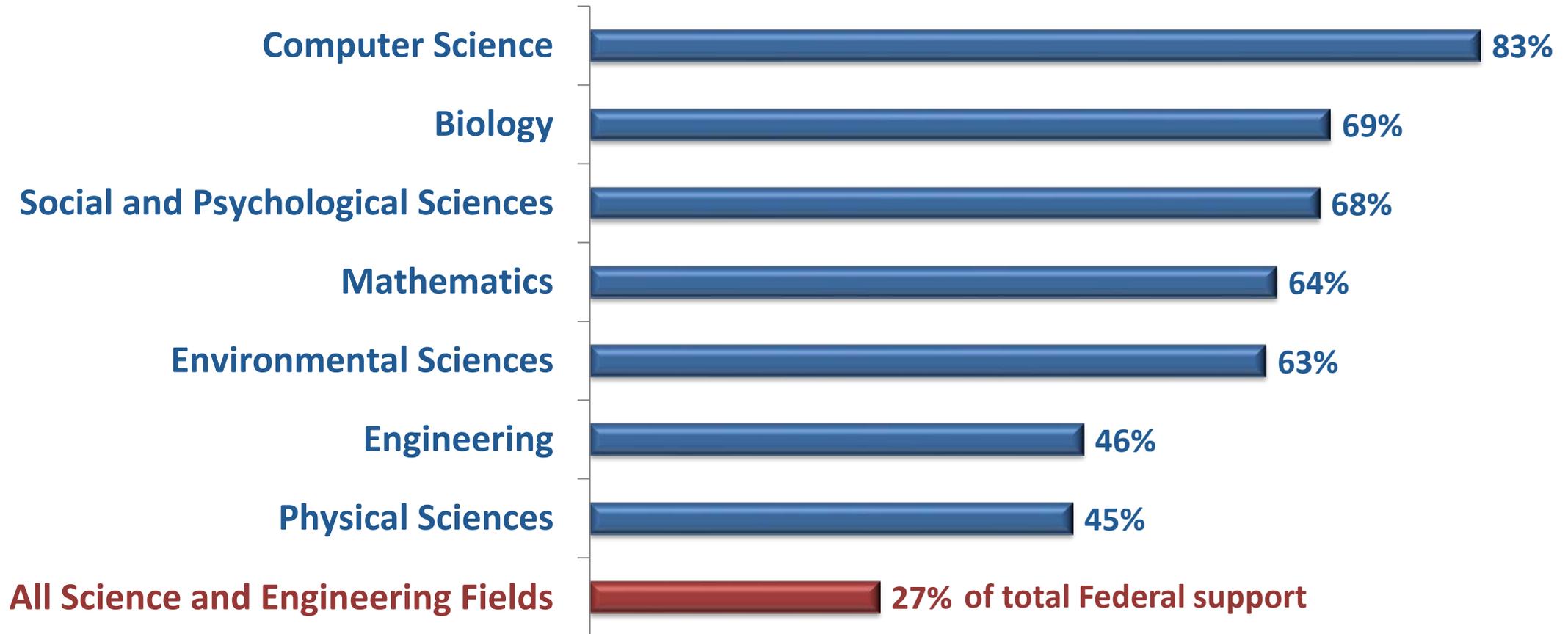


National Science Foundation

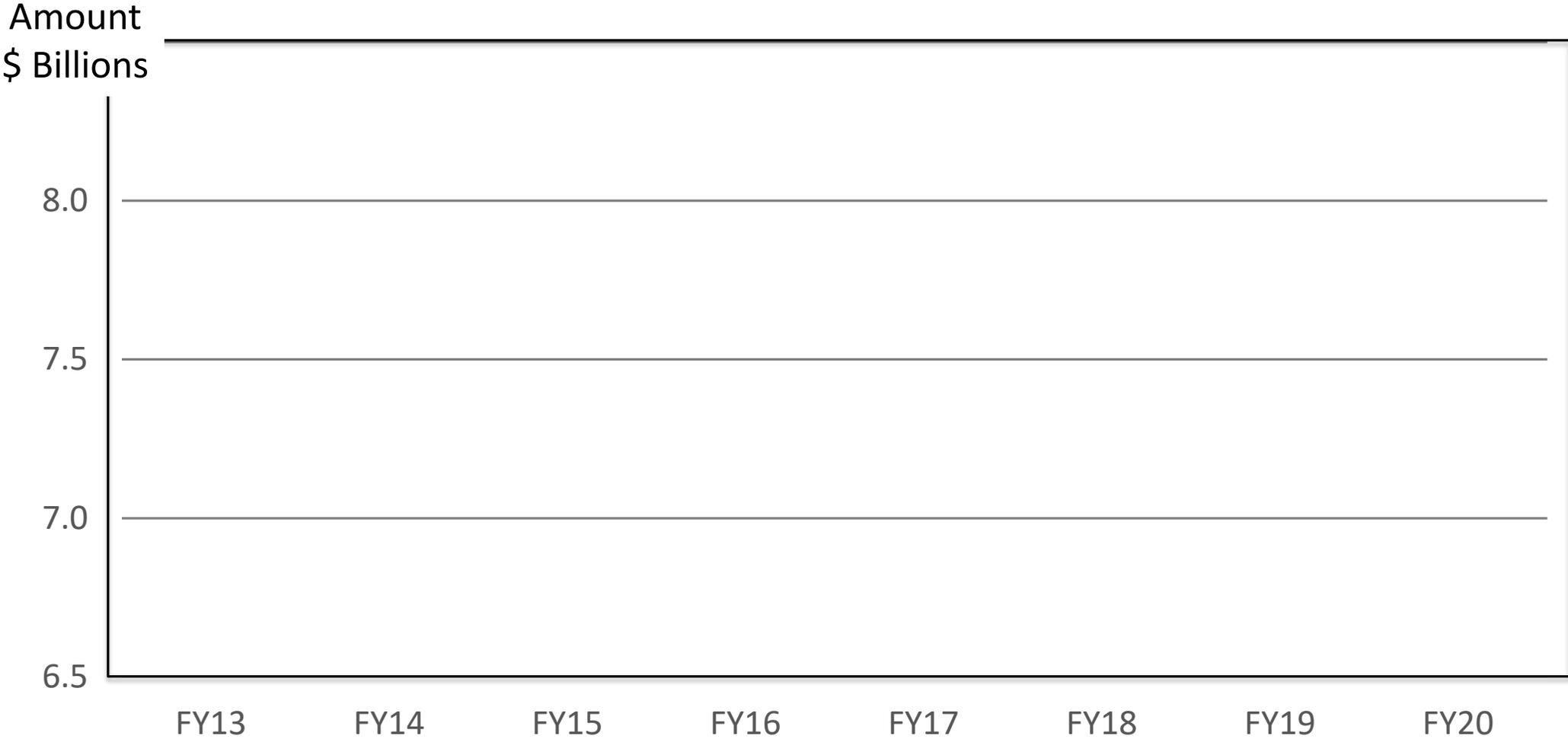
NSF Supports Academic Basic Research



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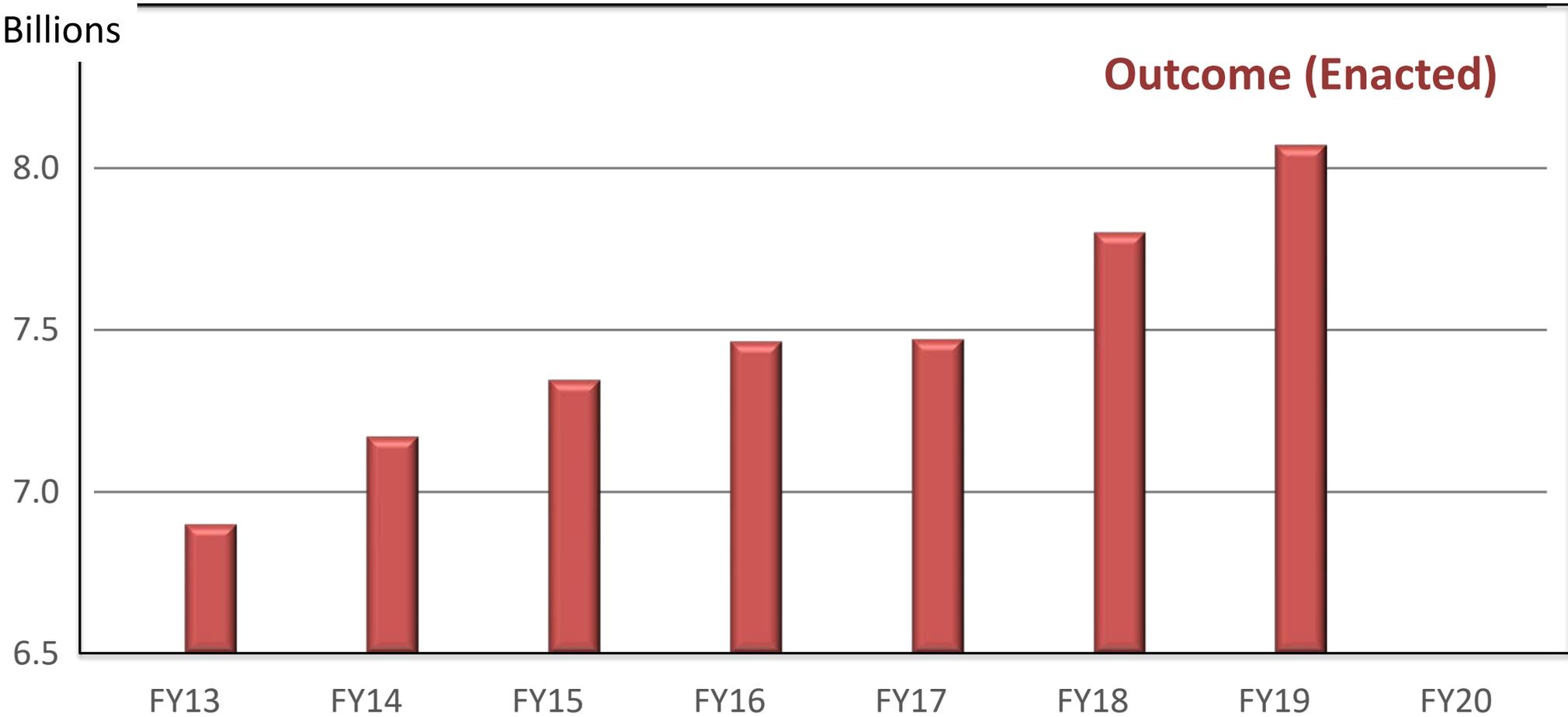


Appropriations Requests and Outcomes FY 2013 - 2020



Appropriations Outcomes FY 2013 - 2020

Amount
\$ Billions

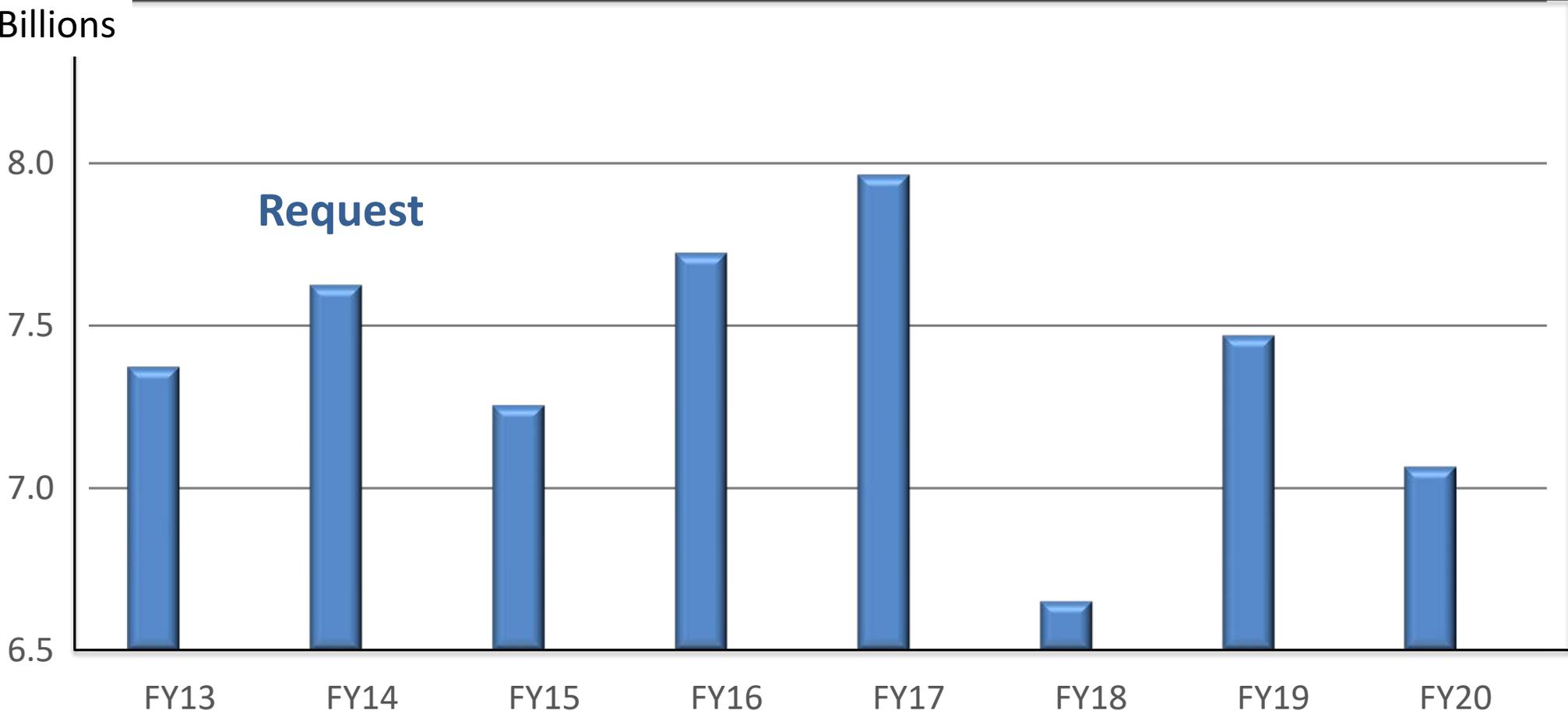


Outcome (Enacted)



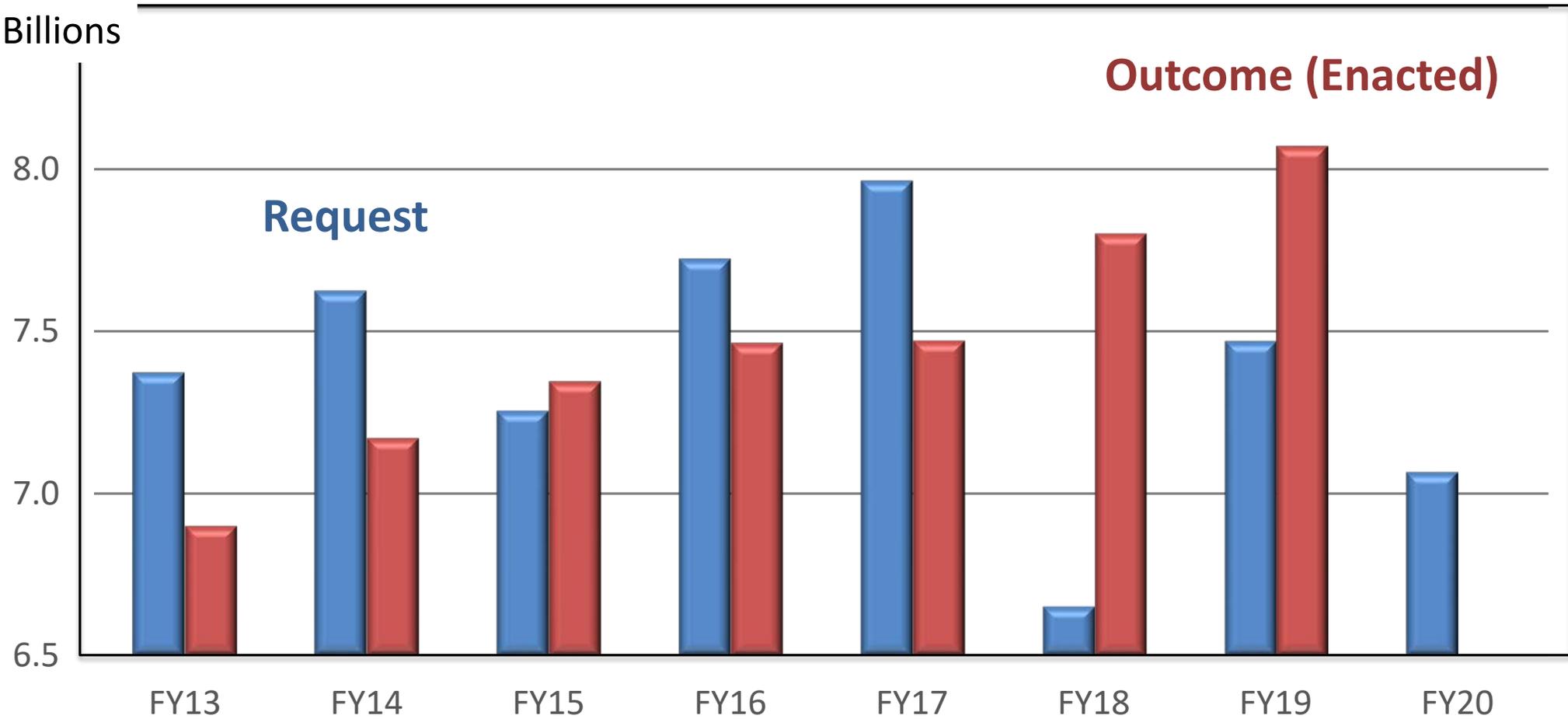
Appropriations Requests FY 2013 - 2020

Amount
\$ Billions



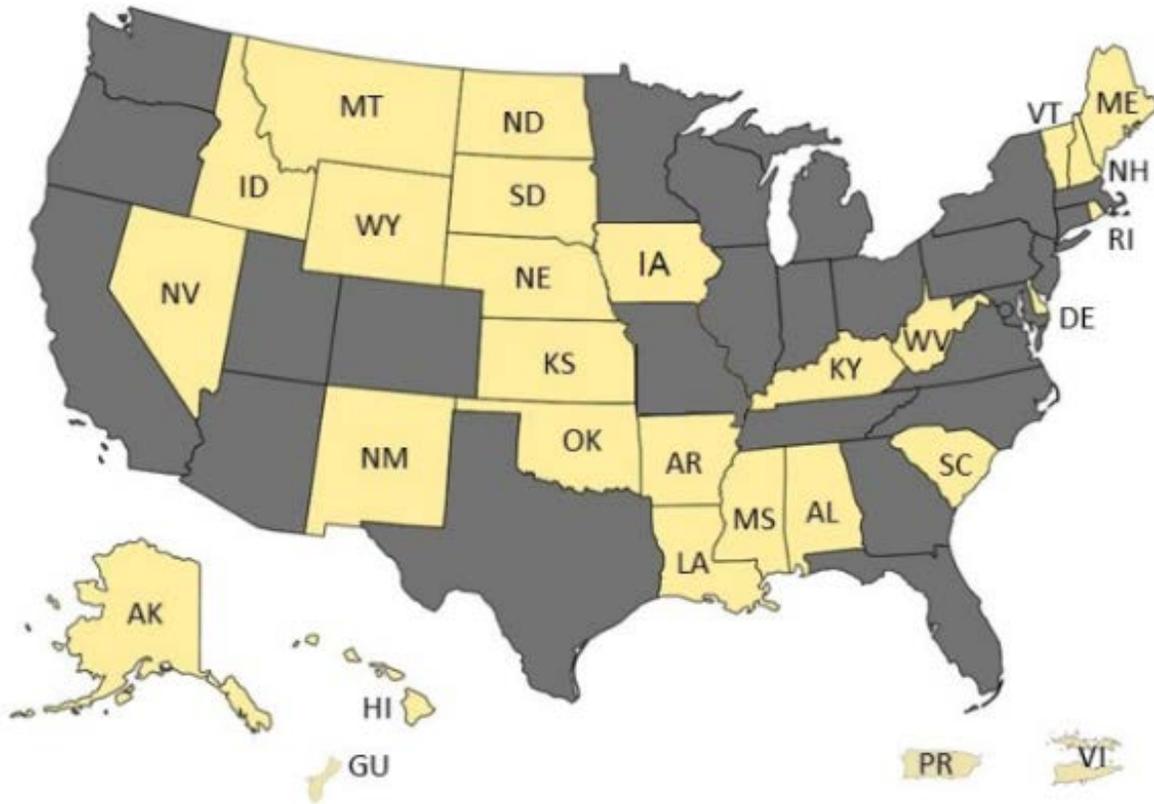
Appropriations Requests and Outcomes FY 2013 - 2020

Amount
\$ Billions



Established Program to Stimulate Competitive Research

Strengthen capacity and capability - enhance research competitiveness



Goals



Catalyze research capability

Establish development paths



Broaden participation



Engage nationally and globally

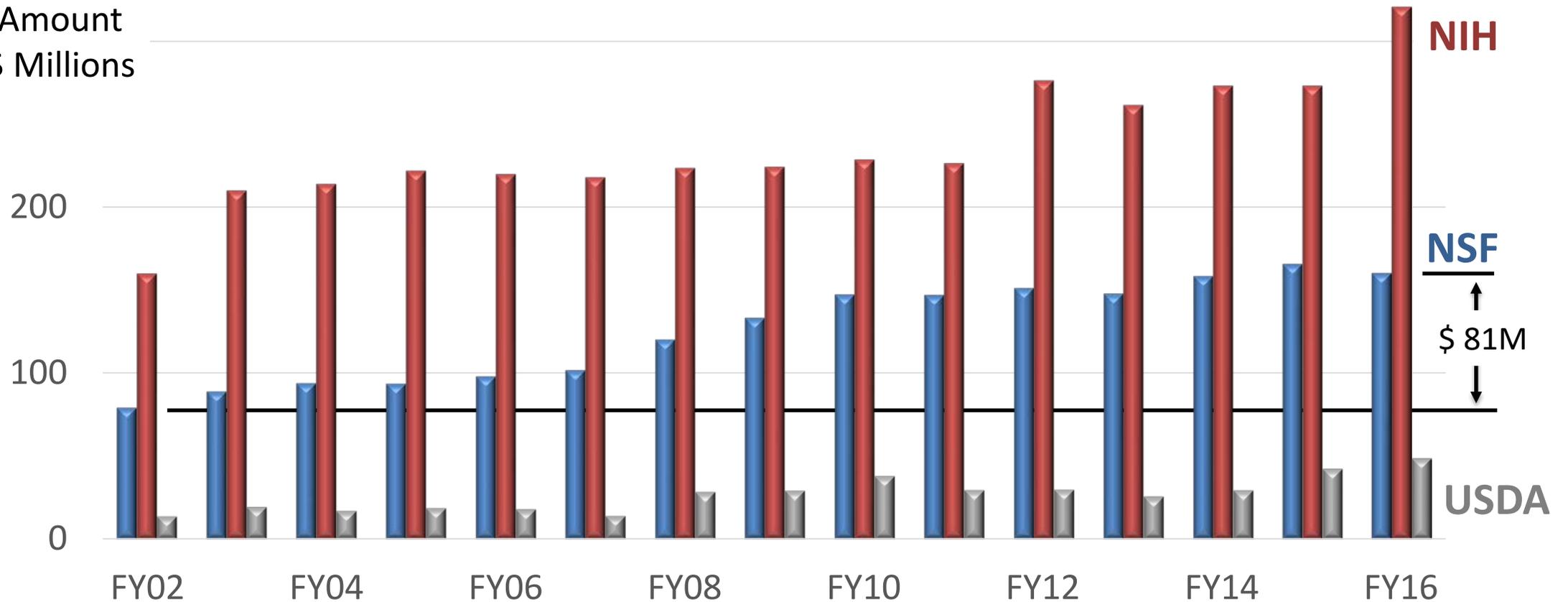


Economic development



EPSCoR and EPSCoR-like Program Budgets

Amount
\$ Millions



Data from *Science & Engineering Indicators 2018*



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NSF's 10 Big Ideas | Research Ideas

Building on Early Investments and New Opportunities

The Future of Work at the Human-Technology Frontier



Windows on the Universe:
The Era of Multi-Messenger Astrophysics



Harnessing
the Data
Revolution



Navigating the New Arctic



The
Quantum
Leap:
Leading
the Next
Quantum
Revolution

Rules of
Life:
Predicting
Phenotype



HARNESSING THE DATA REVOLUTION

Transforming science, engineering, and education



MATHEMATICAL, STATISTICAL, COMPUTATIONAL FOUNDATIONS
INFERENCE
SEMANTICS
EHR
ANALYTICS
PRIVACY
OPEN
PUBLIC ACCESS
DISCOVERY
REPOSITORIES
EDUCATION WORKFORCE
DATA SCIENCE

HARNESSING THE DATA REVOLUTION

FUNDAMENTAL RESEARCH
CYBERSECURITY
SBE
BIO
DOMAIN SCIENCE CHALLENGES
SYSTEMS ARCHITECTURE
INTERNET OF THINGS
REPRODUCIBILITY
STATISTICS
RESEARCH DATA
CYBERINFRASTRUCTURE
MODELING
INTEROPERABILITY
HUMAN-DATA INTERFACE
CISE
GEO
MPS
CAUSALITY
MACHINE LEARNING
VISUALIZATION
DATA MINING



The Future of Work at the Human-Technology Frontier



Scientific and technical challenges to the future of work and productivity



Understanding the Rules of Life

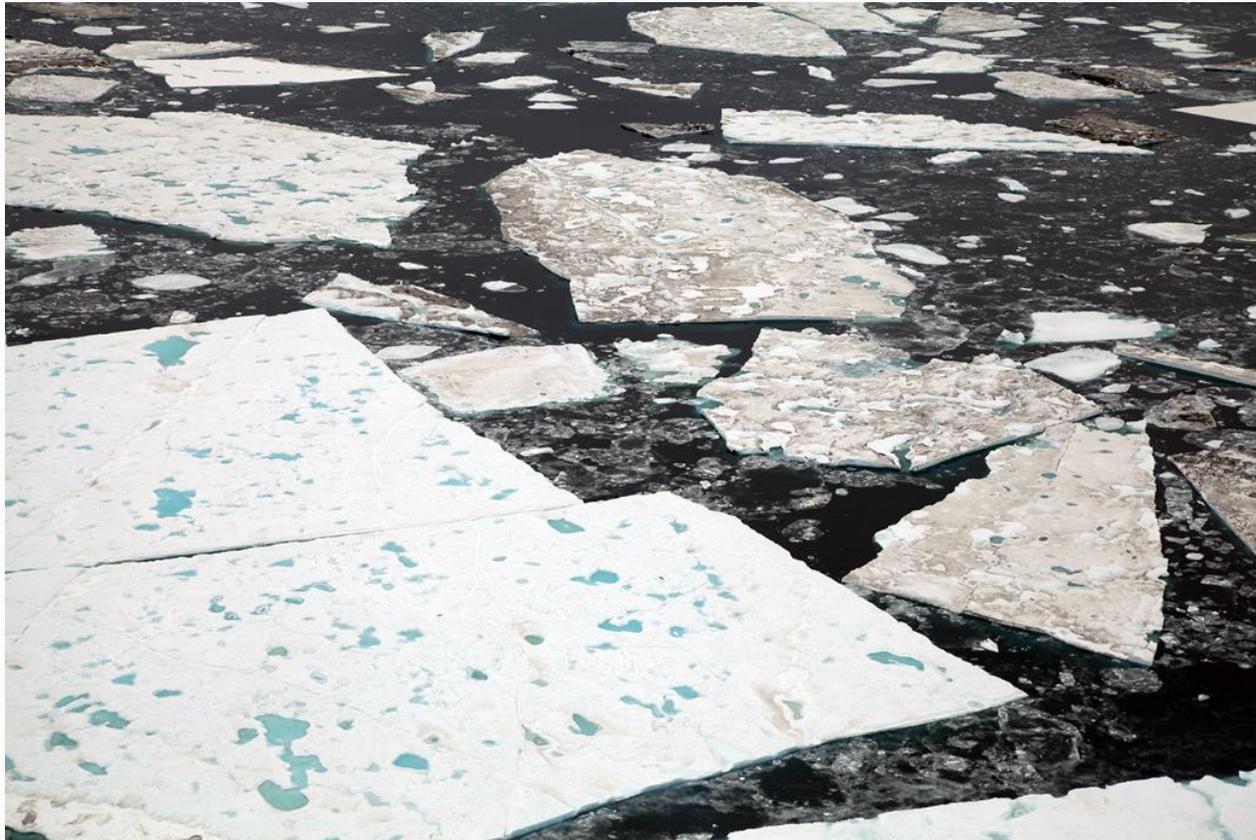


Predicting phenotype

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Navigating the New Arctic

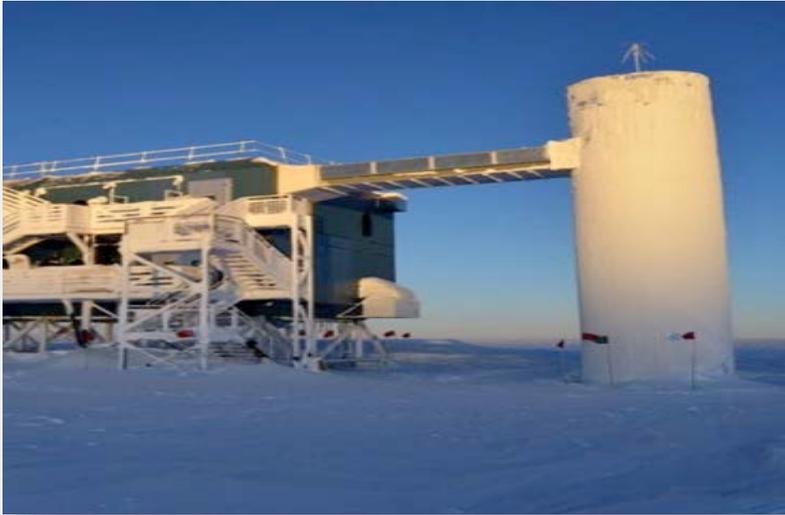


Changes in global climate, weather, and ecosystems



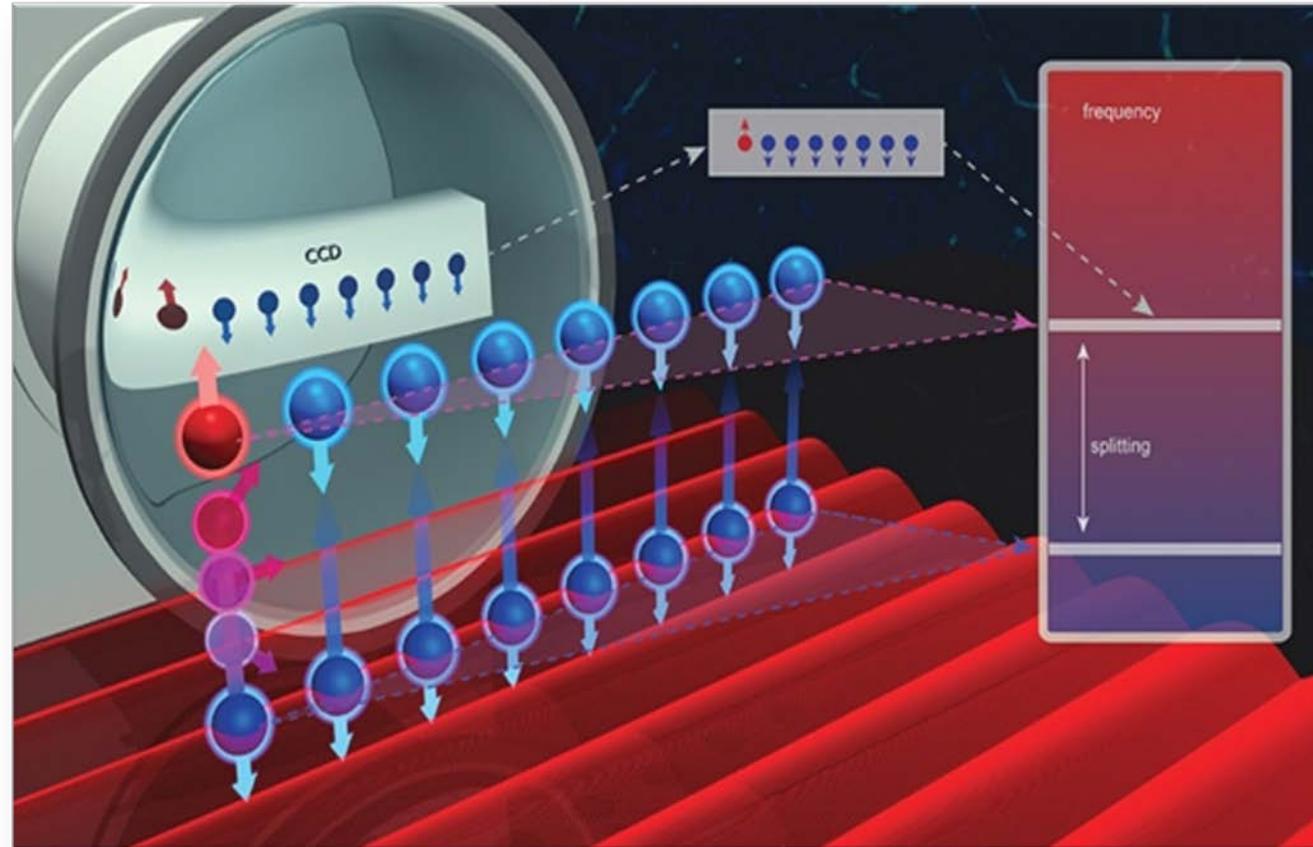
Windows on the Universe

Multi-messenger astrophysics



The Quantum Leap

Entanglement, Superposition, Coherence, ...



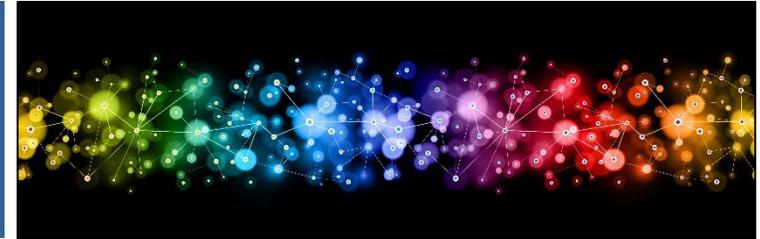
Sensing, Communication, Computation, and Simulation



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NSF's 10 Big Ideas | Enabling Ideas

Growing Convergence Research at NSF



NSF 2026: Seeding Innovation



NSF INCLUDES:
Enhancing STEM through Diversity and Inclusion



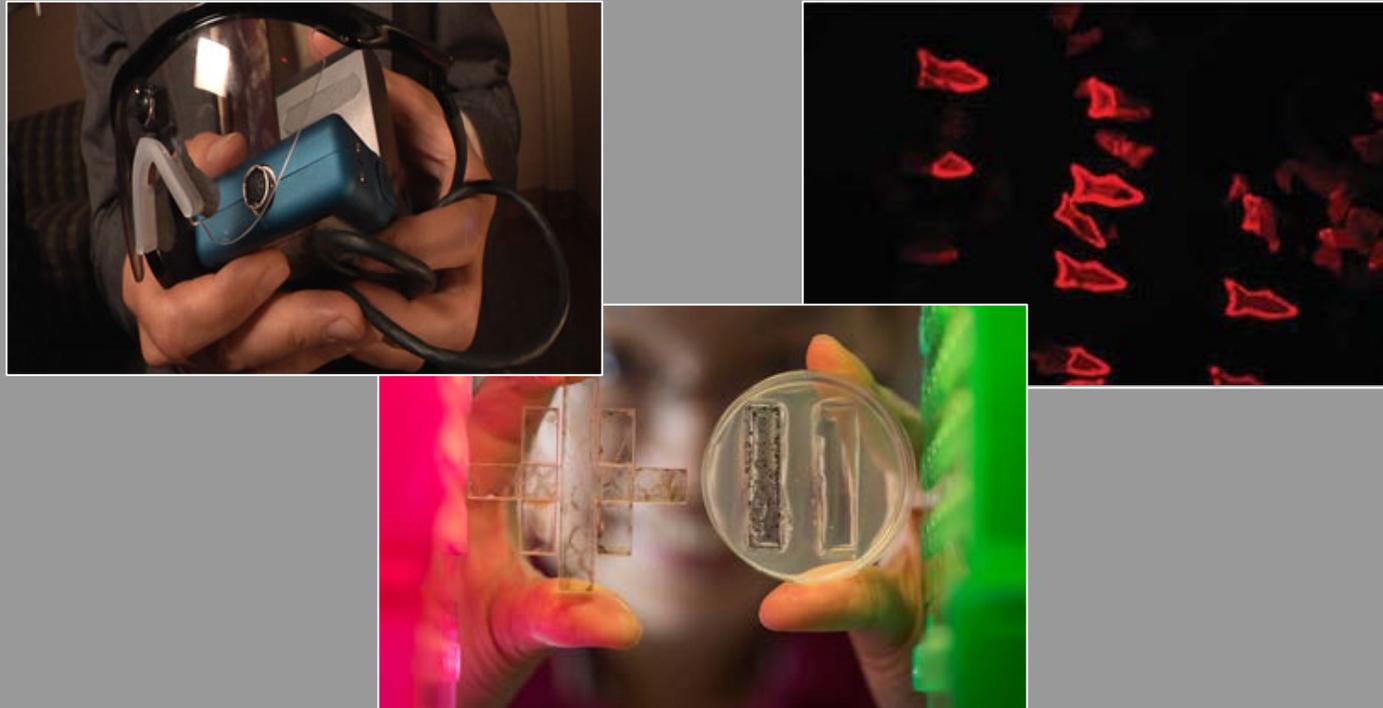
Mid-scale Research Infrastructure



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Growing Convergent Research at NSF



Interdisciplinary, Multidisciplinary, Transdisciplinary, ...



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NSF 2026 Idea Machine



Everyone identifying new directions

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NSF INCLUDES

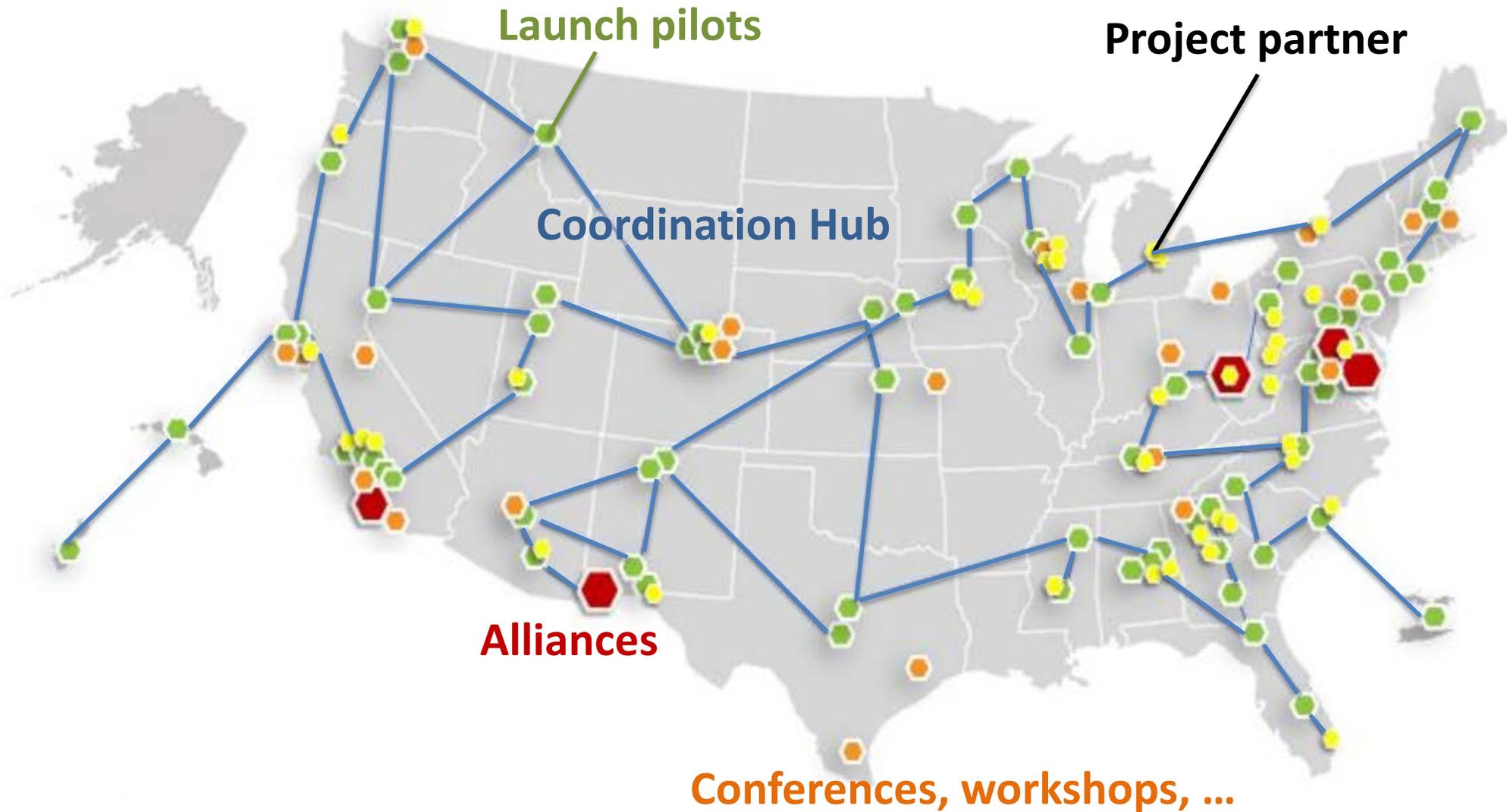


Networks expanding diversity

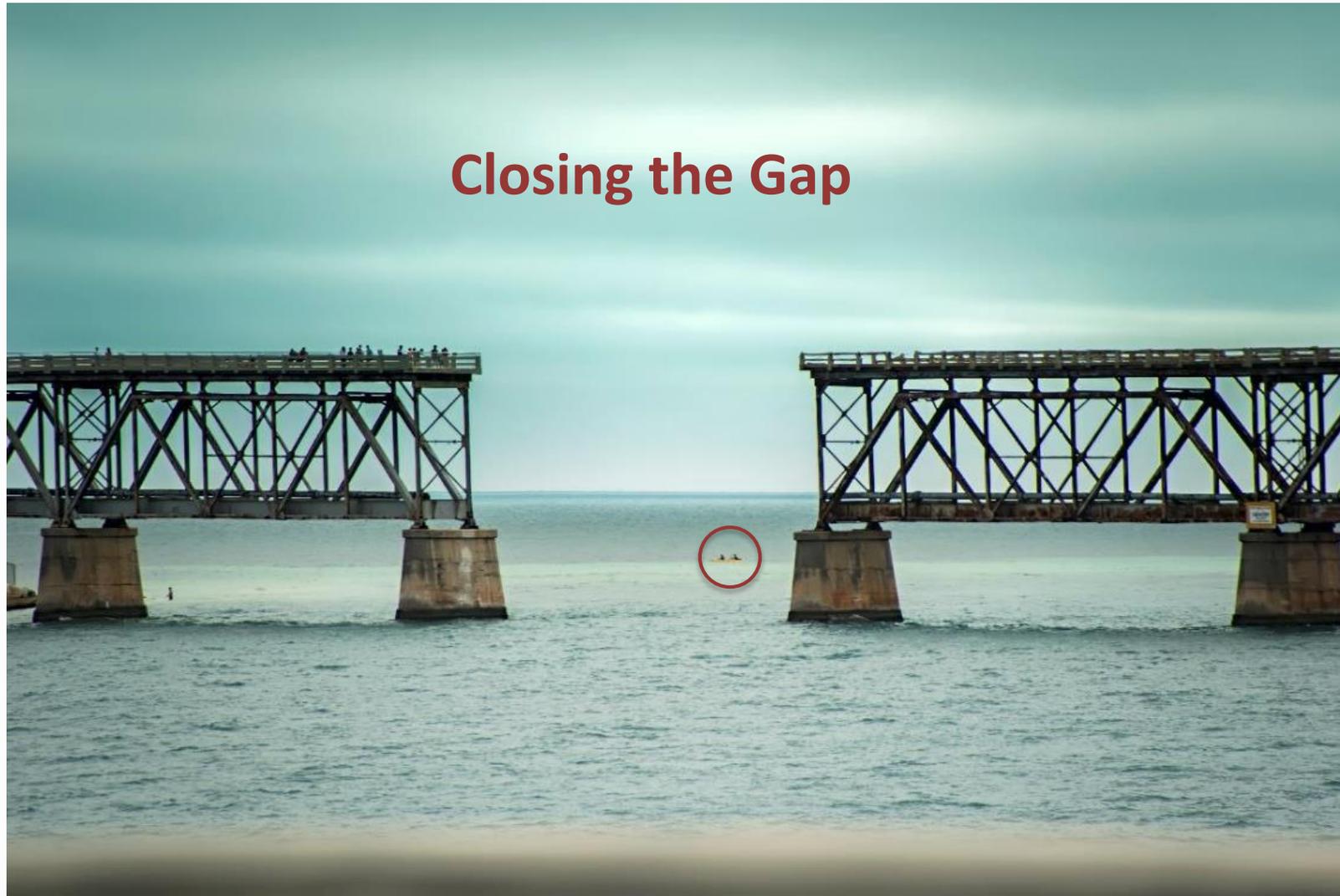
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NSF INCLUDES



Mid-scale Research Infrastructure



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Catalyze research capability

Established development paths



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Economic development

