



NSF Changes in Leadership



Assistant Director
SBE
Kellina Craig-Henderson



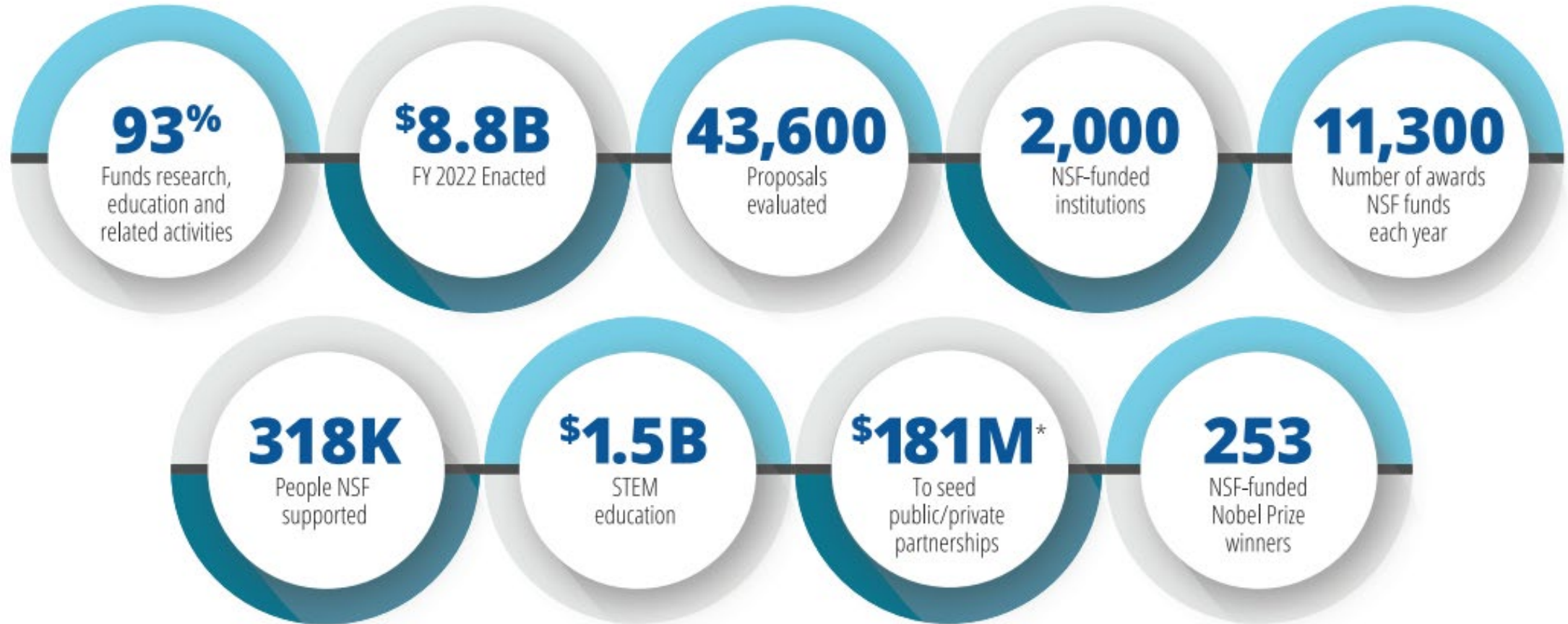
Assistant Director
TIP
Erwin Gianchandani



Deputy Assistant Director
TIP
Gracie Narcho



NSF By The Numbers



Data represents FY 2021 Actuals unless otherwise indicated.

**Corresponds to NSF investments initiated in FY 2021 and spanning multiple years.*

Biden Administration



Clean Energy



Climate Change



Racial Equity



Emerging Industries

Budget Updates

FY22

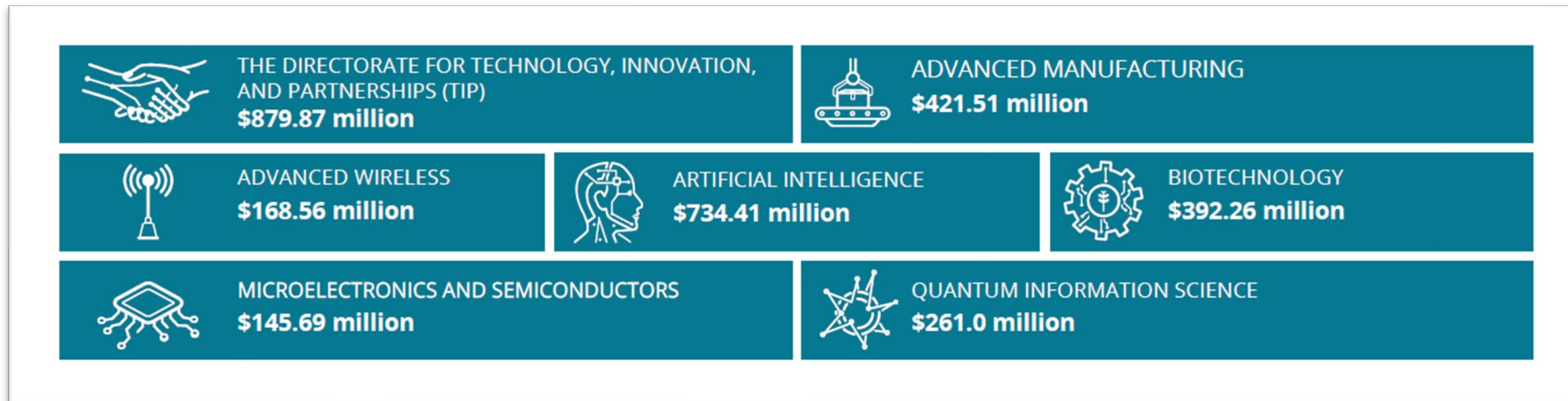
- \$8.8B Enacted for NSF, a 4% increase
- ARP \$79M and 260 awards
- New Strategic Plan released (2022–2026)
- Creation of Technology Innovation and Partnership (TIP) Directorate

FY23

- \$10.5B for NSF, a 19% increase from FY22 Current Plan
- \$1.75B for MPS, a 9.6% increase
- Climate Change, Clean Energy, Emerging Technologies, and Advancing Equity in STEM remain priorities
- Continuing construction & procurement of research infrastructure and instrumentation
- FY23 is making its way through the House and Senate

FY24

- In the internal agency planning phase



ESTABLISHED IN FY2022

DIRECTORATE FOR TECHNOLOGY, INNOVATION AND PARTNERSHIPS (TIP)



A New “Horizontal” to Enhance Use-Inspired and Translational Research



DIRECTORATE FOR TECHNOLOGY, INNOVATION AND PARTNERSHIPS (TIP)

Technology Translation

PFI

SBIR/STTR

Innovative Pathways

Technology & Innovation Ecosystem

Convergence Accelerator

I-Corps

Emerging Technologies

Regional Innovation

Entrepreneurial Fellows

Partnerships as a Foundation

Accelerate Partnerships

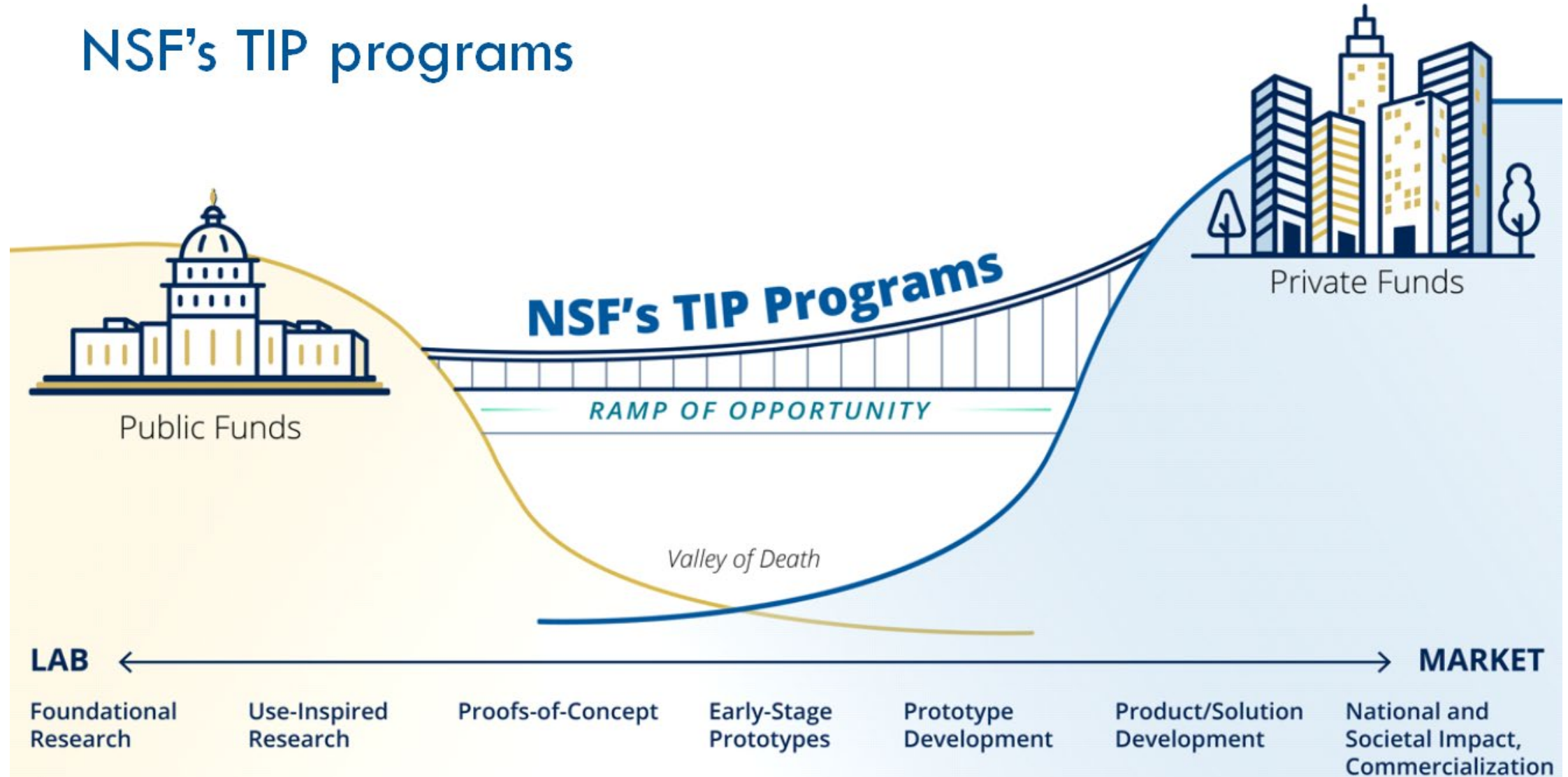
Realigned investments

New investments



Translation, Innovation and Partnership (TIP)

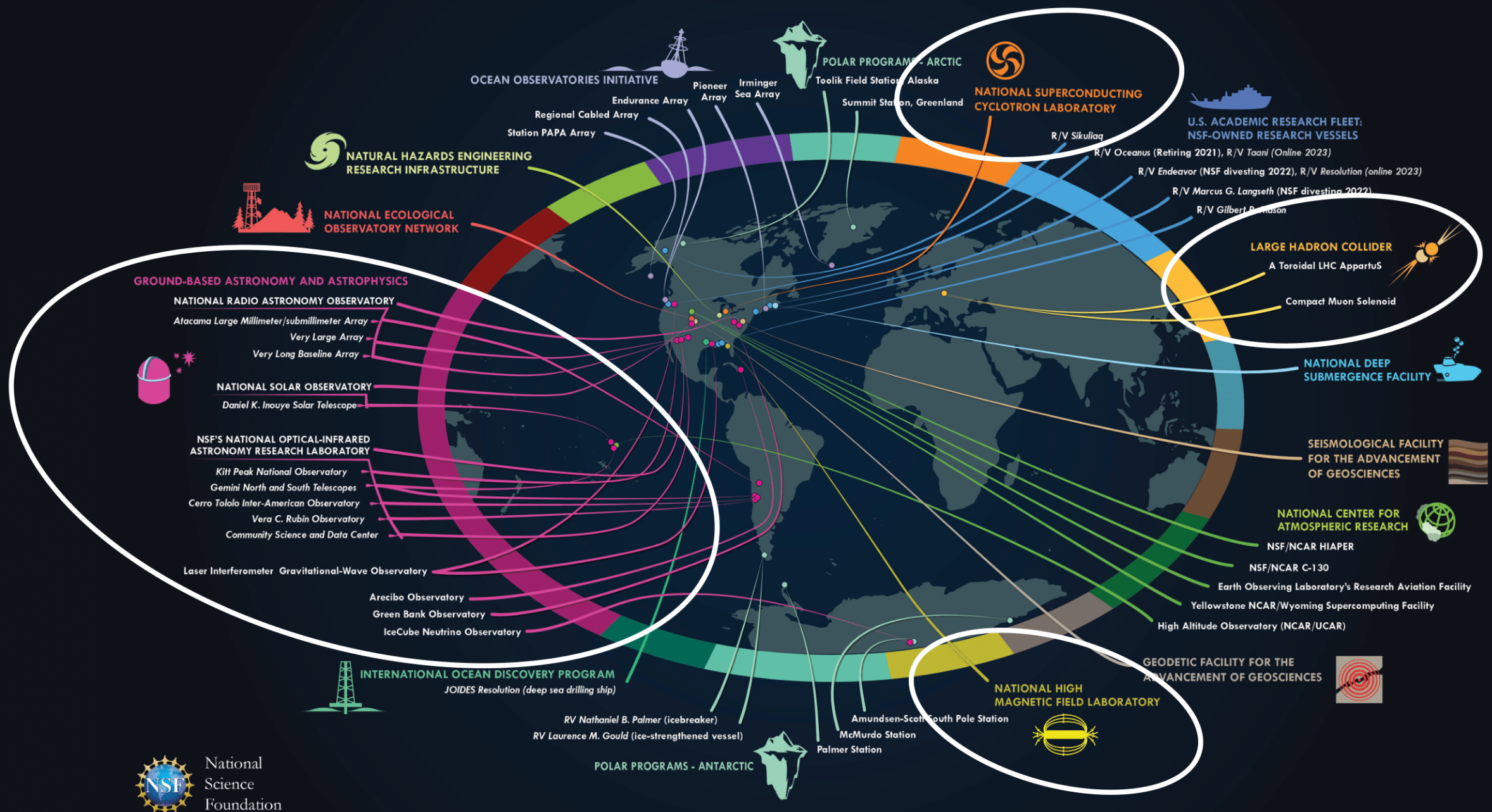
NSF's TIP programs





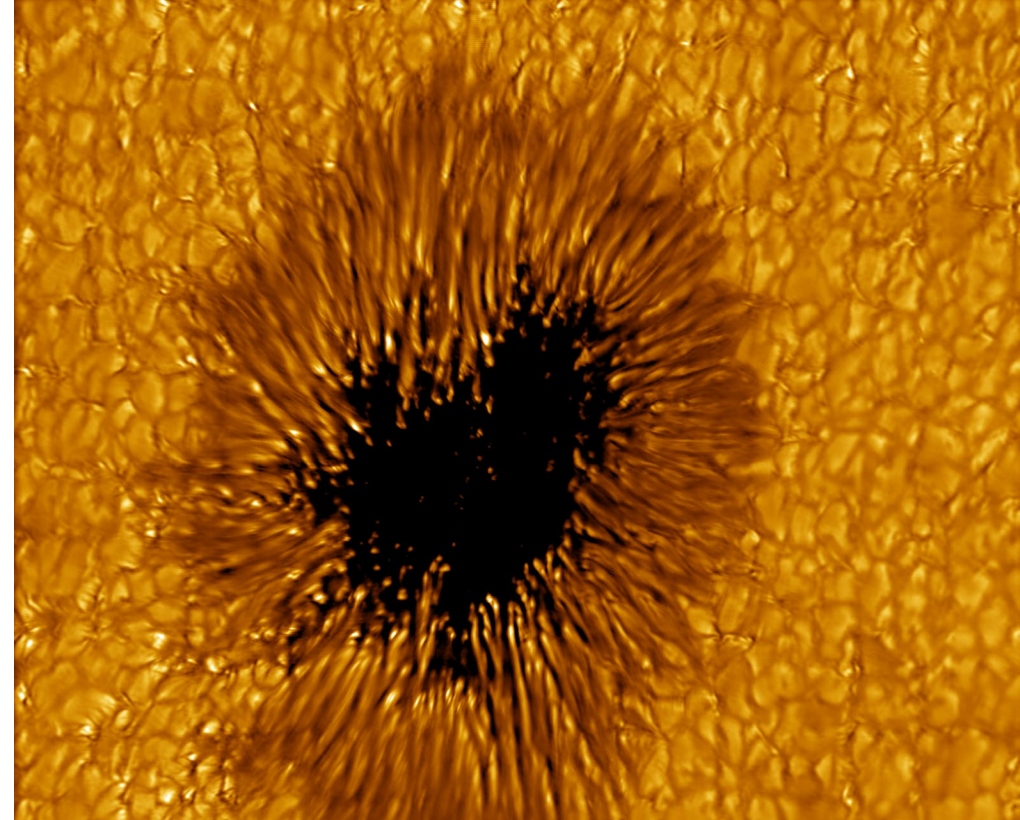
Facilities and Instrumentation

MAJOR MULTIUSER FACILITIES ENABLING BASIC RESEARCH



Facilities Updates: Construction

- DKIST, the world's most powerful solar telescope, commenced operations commissioning on Feb 23, 2022
 - First science observations explore magnetic reconnection and the resulting jets of plasma
- Rubin Observatory ~92% complete, re-baseline being finalized
 - Expect COVID delay of ~22 months,
 - Projected into Operations in mid-2024
- HL-LHC: Progress (~22% complete),
 - COVID impacts being felt in delays and potential supply chain issues; possible impacts from Ukraine



Facilities Updates: Operations

- All Facilities operational, under COVID protocols
- **Arecibo** cleanup complete - focus shifting to future
- **LHC** back online
 - 4 years of science data-taking to start this summer
- **LIGO** preparing for O4
 - Projected start mid-Dec 2022





Transition from NSF's NSCL to DOE's FRIB



- NSF/DOE Joint Oversight Group working since 2010
- NSF-NSCL → DOE-FRIB Transition MOU
- Last NSCL PAC approved experiment completed May 31, 2022





Mid-scale Research Infrastructure Program (MsRI 1 and 2)

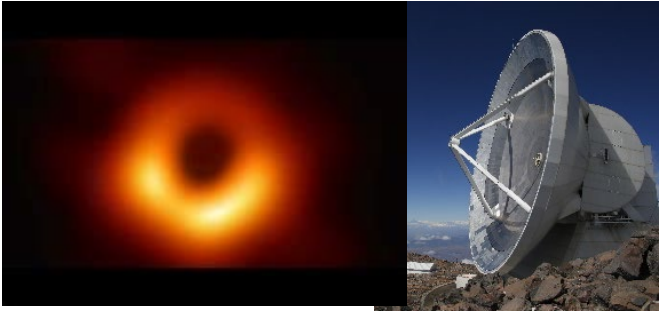
- **Mid-scale Research Infrastructure-1 (MsRI-1)** [NSF 21-505](#)
 - Total request: \$6M - \$20M
 - Implementation = “shovel ready”
 - Design/development = to prepare MsRI implementation proposal

- **Mid-scale Research Infrastructure-2 (MsRI-2)** [NSF 21-537](#)
 - Total request: \$20M - \$100M
 - “Shovel ready”

- Solicitations published in alternate years; next publication in FY23

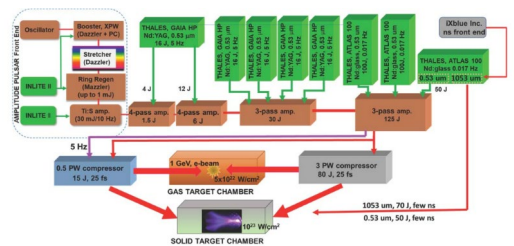
- Solicitation scope: NSF-wide

Mid-scale Research Infrastructure - 1 (MPS-related awards) 2019/20, 2021/22

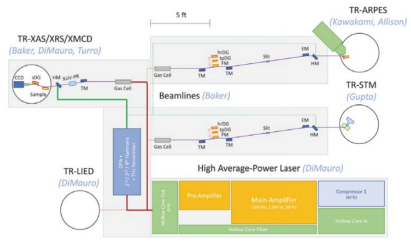



Event Horizon Telescope 2.0
AST-1935980

Zettawatt-Equivalent Ultra-short Pulse Laser System (ZEUS) PHY-1935950



National Extreme Ultrafast Science Facility (NeXUS) CHE-1935885



Next Generation Radar Designs



AST-2131866

CMB S3 Design OPP-1935892



World-class Neutron Spin Echo Spectrometer DMR-1935956



40T All Superconducting Magnet Design DMR-2131790

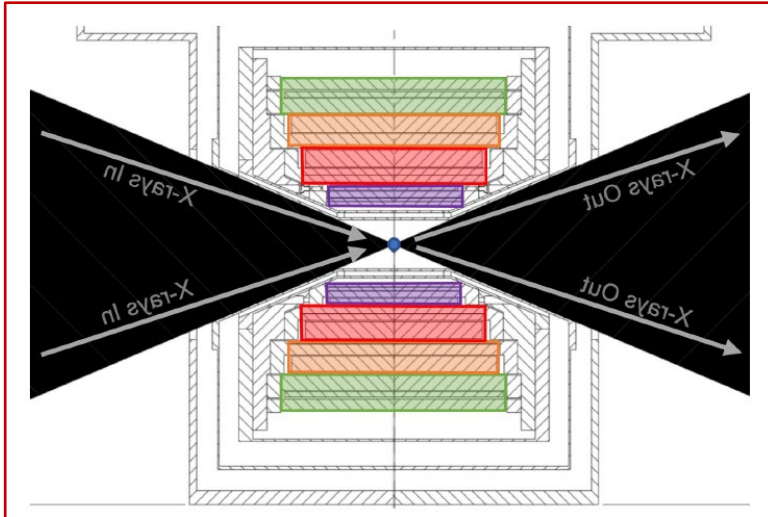


Mid-scale Research Infrastructure - 2 (1st round)



DMR-1946998

High Magnetic Field Beamline



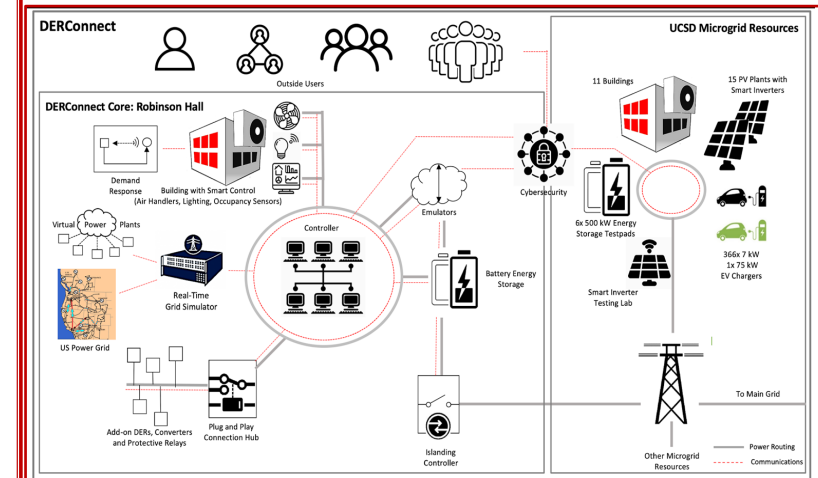
Dedicated High Magnetic Field (HMF) X-ray Beamline at the Cornell High Energy Synchrotron Source (CHESS): The world's highest magnetic field (20 tesla) at a synchrotron facility will enable new science in broad in materials, chemistry, engineering and biology.

Global Ocean Biogeochemistry Array



Network of 500 robotic floats into the Global ocean to collect chemistry and biology data from the surface down to a depth of 2000m.

Grid-Connected Testing Infrastructure for Networked Control of Distributed Energy Resources



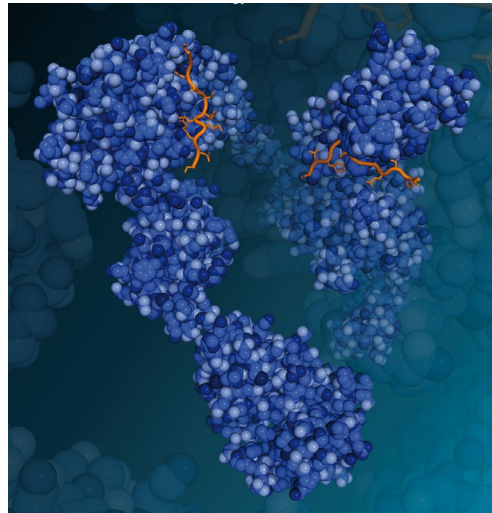
Unique, open-access assets with potential to advance the integration of renewables and distributed energy resources into the power grids of the future.

Mid-scale Research Infrastructure - 2 (1st round)



SBE-1946932

Network For Advanced NMR (NAN)



An integrated network of more than 20 NMR instruments, including two 1.1GHz systems and a shared cyberinfrastructure to support data analysis, preservation and dissemination will enable the broader research community and democratize access to high-field NMR systems.

Research Data Ecosystem (RDE)



A comprehensive data infrastructure for the entire research lifecycle, RDE supports the discovery, preservation, analysis, re-use, and interoperability of data in the social, behavioral, and economic sciences.



Programmatic Updates

NSF 21-080

Dear Colleague Letter: Advancing Discovery with AI-Powered Tools (ADAPT) in the Mathematical and Physical Sciences

Support through this DCL includes:

- EAGERs
- RAISEs
- Supplements to existing awards (incl GOALI and INTERN)

PURPOSE

- Collaboration among MPS domains
- Collaboration between MPS and AI researchers
- Broadening participation
- Academic/industry collaborations

FY22

MPS expects to make 5 EAGER awards and one supplement award for proposals submitted in response to the ADAPT AI DCL in FY 22.

Contacts

- MPS/AST:
Dr. Nigel A. Sharp
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- MPS/DMS:
Dr. Huixia Wang
(huiwang@nsf.gov)
- MPS/PHY:
Dr. James Shank
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Mathematical and Physical Sciences Ascending Postdoctoral Research Fellowships (MPS-Ascend)

31 MPS Ascend Awards made in FY22

12 to 36 Months, \$100,000 per year

- A monthly stipend of \$5,833 (up to \$70,000 annually)
- An annual allowance of \$30,000 for:
 - a) expenses directly related to the conduct of the research and/or
 - b) support of fringe benefits, dependent care, and moving expenses.



Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences

57 LEAPS Awards expected in FY22

- Emphasis on launching the careers of pre-tenure faculty in MPS fields at institutions that do not traditionally receive significant amounts of MPS funding
- Aims to help initiate viable independent research programs for researchers attempting to launch their research careers so awardees can generate competitive grant submissions that build on their LEAPS-funded research
- Up to \$250,000 for 2 years



Partnerships for Research and Education in MPS

GOALS

- **Increase recruitment, retention and degree attainment** by members of those groups most underrepresented in Mathematical and Physical Sciences research
- **Support excellent research and education endeavors** that strengthen such partnership

PREP: Partnerships for Research and Education in Physics

Partners: 11 Physics Frontiers Centers

Funding structure: \$300,000/yr for 3 years

6 awards

PREC: Partnerships for Research and Education in Chemistry

Partners: 8 Centers for Chemical Innovation, Facilities, and Institutes

Funding structure: *Track 1*: \$300,000/yr for 3 years; *Track 2*: \$600,000/yr for 3 years

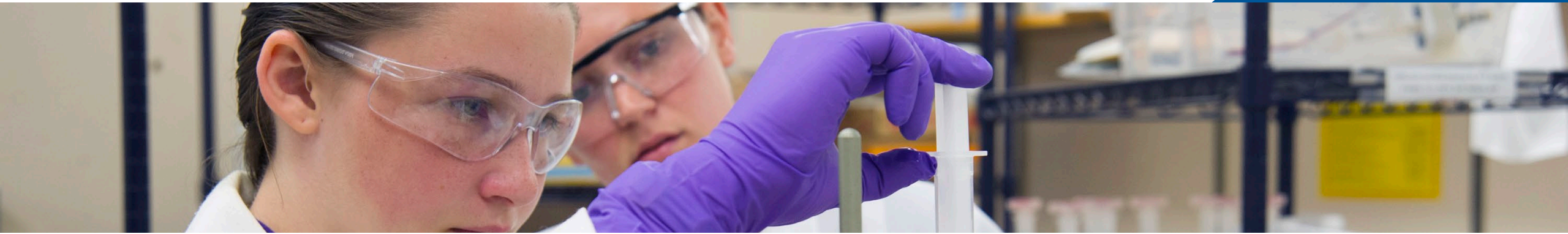
3 awards

PAARE: Partnerships in Astronomy & Astrophysics Research and Education

Eligibility Changes: Lead institution *not* required to be an MSI, collaborative proposals allowed

Funding structure: Range of budgets

11 awards



DCL: MPS-High Supplement

High School Student Research Assistantships Funding to Broaden Participation in the Mathematical and Physical Sciences

[\(NSF 22-041\)](#)

PURPOSE

Broaden participation of high school students who are in groups that have been traditionally underrepresented and under-served in STEM fields.

INTENT

Invite requests which foster interest in the pursuit of studies in the Mathematical and Physical Sciences.

GOAL

Provide supplemental funding to expand number of research and mentoring opportunities for underrepresented high schoolers.



Thank You!

