

# National Science Foundation Resources and Grants: Office of Advanced Cyberinfrastructure

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Office of Advanced Cyberinfrastructure



# OAC Programs



# *Advanced Cyberinfrastructure Funding Opportunities*

## Advanced Computing

Production and operational level advanced computing and data capabilities and services

## Networking & Cybersecurity

Advanced networking and security infrastructure, research and communities of practice capabilities

## Learning & Workforce Development

National research workforce for creating, utilizing, supporting advanced CI: SC�PE, CyberTraining

## Software & Data CI

Supports development and deployment of robust, reliable, sustainable data and software CI

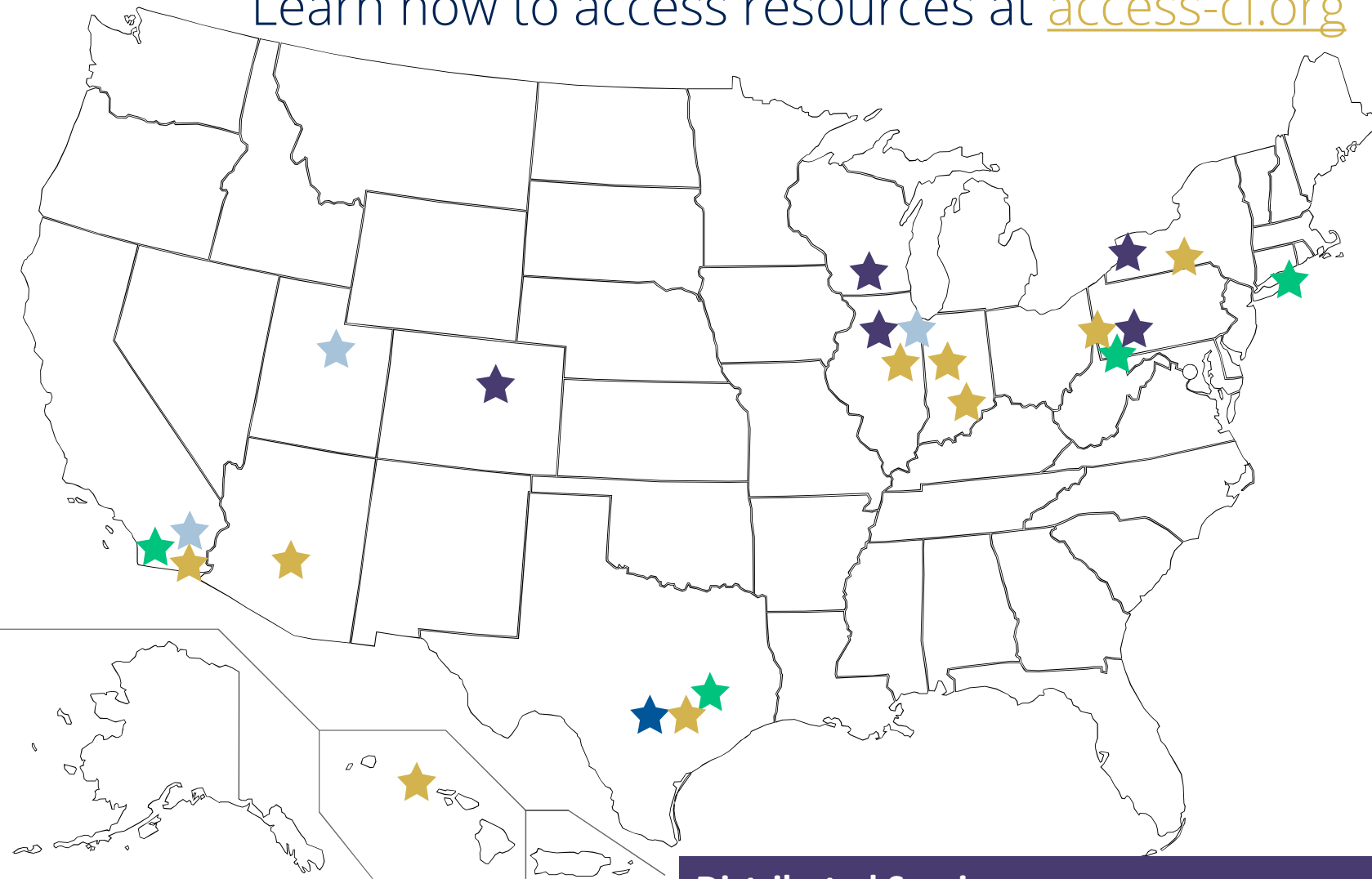
## Strategic Investments

Special opportunities, cross-cutting and national initiatives, CI for open science and public access



# NSF-supported Advanced CI Resources

Learn how to access resources at [access-ci.org](https://access-ci.org)



## Leadership-class

Frontera U of Texas, Austin

## Capacity Systems

Anvil Purdue University

Bridges 2 Carnegie-Mellon University

Delta U of Illinois, Urbana-Champaign

Expanse U of California, San Diego

Jetstream 2 University of Indiana + Partners

Stampede 2 U of Texas, Austin

## Innovative Prototypes/Testbeds

Neocortex Carnegie-Mellon University

Voyager U of California, San Diego

Ookami Stonybrook University

NRP U of California, San Diego

ACES Texas A&M University

## Cloud resources

Cloudbank U of California, San Diego

CloudLab University of Utah

Chameleon University of Chicago

## Distributed Services

PATH/OSG U of Wisconsin, Madison

ACCESS Several Partners



# Continue & Grow the Coordination Ecosystem via **ACCESS**

Allocations

Allocations  
Marketplace and  
Platform Services  
(RAMPS)

End User  
Support

Multi-tier Assistance,  
Training &  
Computational Help  
(MATCH)

Operations &  
Integration

Core National  
Ecosystem for  
CyberinfrasTructure  
(CONNECT)

Monitoring &  
Measurement

Monitoring &  
Measurement

Coordination  
Office

Open CI Ecosystem  
to Advance Scientific  
Discovery  
(OpenCI)

- \$52.5M Investment over 5 years
- 70+ Researchers, Staff, Students
- 75+ Collaborating Institutions
- Leverages parallel programs to integrate, innovate, and scale (e.g., CyberTraining, CC\*, CSSI)
- **Details: <http://access-ci.org>**



# Campus Cyberinfrastructure (CC\*)

Must be SCIENCE DRIVEN

Must have a campus Cyberinfrastructure Plan (except Strategy awards)  
Seek to create partnerships – researchers, educators, IT organization

## Area 1: Data Driven Networking Infrastructure

Campus up to \$700K  
Region up to \$1.4M

Technical solution; network management plan and diagram; leverage community

## Area 2: Computing and the Computing Continuum

Campus up to \$700K  
Region up to \$1.4M

Multiple science drivers and needs; architecture; 20% is shared, typically through PATH

## Area 3: Network Integration and Applied Innovation

Small up to \$500K  
Large up to \$1M

Networking R&D applied to the campus network with graduate student involvement

## Area 4: Data Storage and Digital Archives

Campus up to \$700K  
Region up to \$1.4M

Multiple science drivers and needs; architecture; 20% is shared, typically through OSDF

## Area 5: Strategy

Campus up to \$100K  
Region up to \$200K

A grant to help teams plan for a full proposal!  
No CI plan; Funds community building activities; No hardware

See [NSF 24-530](#) for details. Deadline on October 15, 2024.

Program Officers: Amy Apon, [awapon@nsf.gov](mailto:awapon@nsf.gov) and Kevin Thompson, [kthompso@nsf.gov](mailto:kthompso@nsf.gov)



# REGIONAL RESEARCH AND EDUCATION NETWORKS IN THE UNITED STATES



## QUILT MEMBERS AND AFFILIATES



## Quad Chart for:

# Setting Up Research Foundations Multiple Organization Regional OneOklahoma Friction Free Network (SURF-MORe-OFFN)

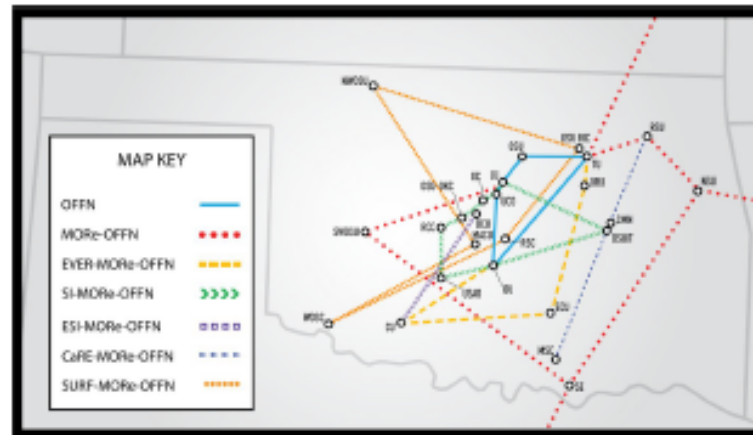
### Challenges Project Seeks to Address:

- Extend the OneOklahoma Friction Free Network to four under-resourced campuses and one research center by providing advanced networking capabilities
- Enable fast and secure data transfers required for scientific and high-performance computing
- Offer collaborative research computing opportunities across campuses
- Expand research and education in a variety of disciplines including natural science, cybersecurity, biomedical engineering and nursing

### Solutions and Deliverables:

- Provide a proven off-the-shelf hardware platform
- Realize the Science DMZ goals through the use of independent network connections, consisting of dedicated optical pathways to OneNet and the local campus backbone
- Deploy a flexible infrastructure, to be used simultaneously by multiple research entities
- Leverage federation to provide oversight and visibility into the operations of the platform

### OneOklahoma Friction Free Network (OFFN) Historical Project Map



### New Participating Institutions:

- Mid-America Christian University
- Northwestern Oklahoma State University
- Oklahoma State University Biomedical Imaging Center
- Rose State College
- Western Oklahoma State College

### Scientific and Broader Impacts:

- Enable participating institutions to expand research and education activities on their campuses and foster collaborative opportunities for faculty and students across Oklahoma
- Expose faculty and students to leading researchers and cyber-infrastructure practitioners through STEM and CI opportunities that impact education for undergraduate and graduate students
- Reach diverse student groups, including Hispanic, military, first-generation and adult learners
- Increase competitiveness to create a stronger and more diverse workforce both within Oklahoma and nationwide

### OneNet Dashboard:

- <http://dashboard.offn.onenet.net/maddash-webui/>

### Previous Related Work:

- <https://onenet.net/care-more-offn-award-expands-oklahomas-research-network/>





# Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining)

- **Long-term vision:** Computational and Data-driven Science for All scientists and engineers
  - Prepare, nurture, and grow the scientific research workforce, including students, instructors, and research CI professionals
- Ensure broad adoption of **CI** tools, methods, and resources
- Integrate CI and Computational and Data-enabled Science and Engineering (CDS&E) skills into undergraduate and graduate curricula
  - Address emerging needs and unaddressed bottlenecks through innovative and scalable training
  - Catalyze research with training and educational activities
- **Broaden CI access** and adoption by varied institutions, scientific communities, and underrepresented groups.



# CyberTraining Project Classes

- **Pilot:** Exploratory projects, \$300K over 2 years
- **Small implementation:** \$500K over 4 years
- **Medium implementation:** \$1M over 4 years

1. Identify challenges in research workforce development
2. (a) Broaden use of CI resources (b) CI skills training – expected to coordinate with ACCESS ([access-ci.org](http://access-ci.org))
3. Scalability and sustainability of the training program
4. Recruitment and evaluation plans
5. Collective impact strategy
6. Fostering a suitable community

At least one  
option in #2

Pilot

Small

Medium



# Strengthening the Cyberinfrastructure Professionals Ecosystem (SCIPE)

## FUNDING

- Approximately \$15M for up to 4 awards
- Support for research CI professionals' services

## CYBERINFRASTRUCTURE PROFESSIONALS

- Develop, manage, and support effective use of CI
- System administrators, research staff, software engineers, data curators, CI facilitators, ...

## IDEAL FOR PIs WHO ...

- Are ready to connect & coordinate with national S&E research communities
- Whose institutions will develop sustainable long-term career paths for CIPs



NSF 23-521

# Cyberinfrastructure for Sustained Scientific Innovation (CSSI)

## Goals

- Supports the **development and deployment** of robust, reliable and sustainable **data and software cyberinfrastructure**
- Brings **innovative** capabilities towards sustained scientific innovation and discovery
- Provides a **cross-directorate** opportunity to advance common approaches to sustain and innovate research cyberinfrastructures

## Project Classes

- **Elements:** Small groups that will create and deploy robust capabilities in one or more significant S&E areas. (Awards  $\leq$  \$600K, up to 3 years)
- **Framework Implementations:** Larger, interdisciplinary teams organized around the development and application of common infrastructure aimed at solving common research problems in one or more S&E areas. (Awards between \$600K - \$5 Million, between 3-5 years)
- **Transition to Sustainability:** Groups who will execute a well-defined sustainability plan for existing CI to impact one or more S&T. (Awards  $\leq$  \$1 Million, up to 2 years)



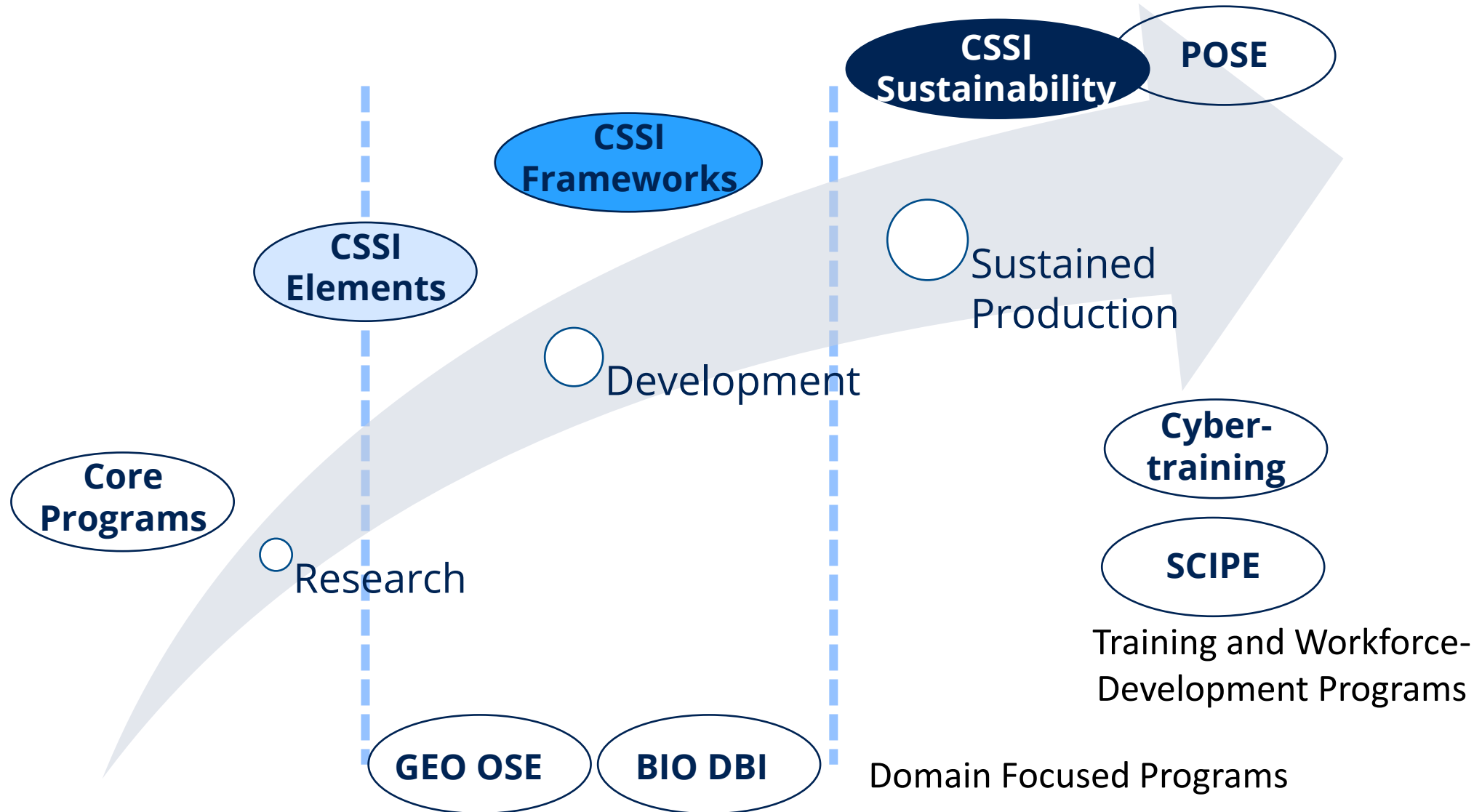
# Cyberinfrastructure for Sustained Scientific Innovation (CSSI)

## Community Usage Metrics

- Quantifiable metrics to measure the community adoption, usage, or other type of engagement.
  - **Also include targets for each year of the award.**
- These metrics should also be appropriate for the programmatic specific areas the project targets as well as for the proposed type of CI to be developed.
- The viability of the mechanisms employed for collecting the metrics should be described.



# NSF Software and Data CI programs

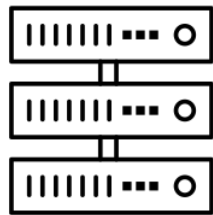


# National AI Research Resource (NAIRR)



# Vision for the National AI Research Resource

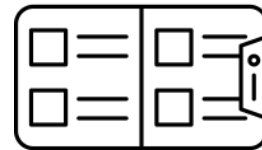
**A widely-accessible, national research infrastructure** that will advance the U.S. AI R&D environment, discovery, and innovation by empowering a diverse set of users through access to:



Secure, high-performance, privacy-preserving **computing**



High-quality **datasets**



Catalogs of **testbeds** and **educational materials**



**Training** tools and **user support** mechanisms

## Goals:



Spur **innovation**



Increase the **diversity** of talent in AI



Improve U.S. **capacity** for AI R&D



Advance **trustworthy AI**



# Apply for resources at [nairrpilot.org](https://nairrpilot.org) Today!



<https://nairrpilot.org/>

*Built by SGX3*

## Current Opportunities

CLASSROOM AND EDUCATOR RESOURCES

Apply

↑  
Educators

RESEARCHER RESOURCES

Apply

↑  
Researchers

OTHER RESOURCES

View other resources

Initial datasets and trainings opportunities

# NAIRR Classroom Pilot

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## Motivation

- To promote and diversify AI education and AI workforce development.
- To demonstrate the value and potential impact of the full NAIRR vision to expand access to the critical computing, data, model, software, and user support resources needed to advance AI education and research in a manner that protects privacy, civil rights, and civil liberties.
- Broadening access to AI resources and enable educators to make state-of-the-art inclusive AI educational experiences available nationwide.



[https://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=nsf24109](https://www.nsf.gov/publications/pub_summ.jsp?ods_key=nsf24109)

# NAIRR Pilot Resource Requests to Advance AI Research

Already have an allocation and need help? [Submit a ticket.](#)

[Submit a ticket](#)

In the NAIRR Pilot, the US National Science Foundation (NSF), the US Department of Energy (DOE), and numerous private and non-profit sector partners are providing an opportunity for the research community to request access to a set of computing, model, platform and educational resources for projects related to advancing AI research. This call for proposals will be open from May 6, 2024, until the end of the NAIRR Pilot program or until all resources have been committed to projects.

Proposals will be reviewed on an ongoing monthly cycle. Requests submitted by the 15th of the month will be reviewed and have their outcome decided by the end of the month. Projects will be awarded for twelve (12) months duration.

## Eligibility

Home

Email Print Share

NSF 24-093

# Dear Colleague Letter: National Artificial Intelligence Research Resource (NAIRR) Pilot Demonstration Projects

May 28, 2024

Dear Colleagues:

The National Artificial Intelligence Research Resource (NAIRR) Pilot, led by the Office of Advanced Cyberinfrastructure (OAC) of the National Science Foundation (NSF), has been launched as a proof of concept to demonstrate the value and potential impact of the NAIRR concept as described in the [NAIRR Task Force Report](#). Activities aligned with the NAIRR Pilot vision include facilitating researcher and educator requests for computing, model access, and other resources; integrating data, software, platforms, and tools; reaching new and broad communities; fostering positive end user experiences; and building a NAIRR pilot user community. These activities are administered by designated working groups and overseen by the NAIRR Pilot Program Management Office (PPMO). More information about the NAIRR Pilot and contributing organizations can be found at the [NAIRR Pilot NSF site](#) and at [nairrpilot.org](http://nairrpilot.org).

This Dear Colleague Letter (DCL) announces NSF's interest in receiving Early-concept Grants for Exploratory Research (EAGER) proposals and supplemental funding requests for NAIRR Demonstration Projects to highlight innovative use cases and technologies that make use of the NAIRR Pilot.

NAIRR Pilot Demonstration Projects are multi-disciplinary efforts involving a team of AI researchers, domain scientists, and/or cyberinfrastructure specialists who are undertaking specific research challenges that innovatively use, integrate with, or rely on one or more NAIRR Pilot requestable resources. Demonstration Projects should result in prominent scientific publications and demonstrate potential capabilities of a future full NAIRR.

Proposed projects should be submitted as supplemental funding requests from existing collaborative teams or as EAGER proposals from new collaborative teams to make innovative use of NAIRR resources to undertake ambitious, near-term research through demonstration projects.

# Immediate and evolutionary plan

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## Launch Pilot Jan 2024



## Enhanced Pilot Spring/Summer 2024



## Full Pilot January 2025

- Initial organization and governance
- Initial open opportunity using NSF and DOE resources
- Initial datasets/model contributions from agency partners
- RFI for Researcher and Educator Use Cases

- Operating governance, technical and executive committees
- Open opportunity integrating partner resources
- Demonstration projects
- Building trustworthy AI policies and procedures

- Mature early user program
- Operating portal, operations & user support
- Initial lessons learned from focus areas.
- Growing community of NAIRR pilot researchers and partners

# Other NSF Programs



# Secure and Trustworthy Cyberspace (SaTC) (NSF 24-504)

The SaTC core program welcomes proposals that address cybersecurity and privacy, and that draw on expertise in one or more of these areas: computing, communication, and information sciences; engineering; education; mathematics; statistics; and social, behavioral, and economic sciences. Proposals that advance the field of cybersecurity and privacy within a single discipline or interdisciplinary efforts that span multiple disciplines are both welcome.

- Core proposals can be small (up to \$600,000 in total budget, with durations of up to three years) or medium (\$600,001 to \$1,200,000 for up to four years)

**No deadlines (submissions currently open)**

**LEARN  
MORE!**



**Program  
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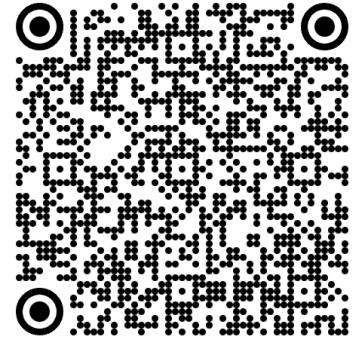
# Secure and Trustworthy Cyberspace (SaTC) (NSF 24-504)

EDU: The Education (EDU) designation is used to label proposals focusing entirely on cybersecurity and privacy education and training.

- EDU proposals are limited to \$400,000 in total budget, with durations of up to three years
- EDU proposals that demonstrate a collaboration, reflected in the PI, co-PI, and/or Senior Personnel composition, between a cybersecurity subject matter expert (researcher or practitioner) and an education researcher may request up to \$500,000 for three years

**No deadlines (submissions currently open)**

**LEARN  
MORE!**



**Program  
Contacts**

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# Secure and Trustworthy Cyberspace (SaTC) (NSF 24-504)

TTP: The Transition to Practice (TTP) designation is used for proposals focusing exclusively on transitioning existing research results into practice.

- TTP proposals can be small (up to \$600,000 in total budget, with durations of up to three years) or medium (\$600,001 to \$1,200,000 for up to four years)
- TTP proposals support the development, implementation, and deployment of later-stage and applied security or privacy research into an operational environment.

**No deadlines (submissions currently open)**

**LEARN  
MORE!**



**Program  
Contacts**

Cliff Wang  
Program Director, CISE/CNS  
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# Join the SaTC Community

The best way to learn how to write a great proposal is to serve on a review panel

Want to be a SaTC reviewer? Please fill out our survey at <https://www.surveymonkey.com/r/SaTCReviewVolunteerInput>

To join the SaTC mailing list: Send  
subscribe SaTC-announce  
to [listserv@listserv.nsf.gov](mailto:listserv@listserv.nsf.gov)  
then respond to the confirmation message



**SaTC volunteer Survey**



# Tribal Colleges and Universities Program (TCUP) NSF 21-595

Program Contact: Jody Chase, [Jchase@nsf.gov](mailto:Jchase@nsf.gov)

## Build Capacity

- Instructional Capacity Excellence in TCUP Institutions (ICE-TI)
- *Targeted* STEM Infusion Projects (TSIP)
- Small Grants for *Research* (SGR)
- *Preparing* for TCUP Implementation (Pre-TI)
- **Cyberinfrastructure Health, Assistance, and Improvements (CHAI) -- window until 10/14/24**

## Build \*on\* Capacity

- TCU Enterprise Advancement (TEA) Centers
- TCUP Secondary and Elementary Teachers in STEM (TSETS)
- TCUP Partnerships – can partner with a non-TCUP partner institution



# Relevant EPSCoR Research Infrastructure Improvement (RII) Programs

## **Track-2: Focused EPSCoR Collaborations (NSF 22-633)**

Interjurisdictional collaborations on research theme chosen by NSF EPSCoR to align with Foundation-wide priority areas (up to \$1.5M per year for up to 4 years; next deadline Jan 2025)

## **Track-4: EPSCoR Research Fellows (NSF 23-535)**

Fellowships for Assistant, Associate Professors, or Research faculty to have extended research visits to premier private, governmental, or academic institutions in the U.S. (up to \$300k over 2 years; next deadline April 2024)

## **EPSCoR Collaborations for Optimizing Research Ecosystems (NSF 23-587)**

E-CORE supports jurisdictions in building capacity in one or more targeted research infrastructure cores that underlie the jurisdiction's research ecosystem (up to \$8M over 4 years, plus renewal opportunity; deadline: July 9 (2<sup>nd</sup> Tuesday in July thereafter))

## **EPSCoR Research Incubators for STEM Excellence (NSF 23-588)**

E-RISE builds a jurisdiction-wide network of teams of researchers that incubate research in a STEM topical area aligned with priority areas for jurisdiction (up to \$7M over 4 years, plus renewal opportunity; next deadline: Aug 13 (2<sup>nd</sup> Tuesday in Aug thereafter)).

# Navigating NSF



# How do I know if the program is a good fit for my research?

- **Read the solicitation carefully**
  - Check for webinars, FAQs, other program resources
  - Check the NSF Awards Search Page
  - Read sample proposals; ask funded PIs (politely!)
- **Talk to NSF Program Officers (and your colleagues) about your ideas**
  - Prep a 1-2 page writeup in advance
  - Key questions, contributions, activities.
  - PO contact etiquette: don't spam separately, but do follow up.



# Writing a Competitive Proposal



# What factors are considered for funding a proposal?

- Available funding
- Responsiveness to the solicitation
- Panel Advice on...
  - Intellectual Merit
  - Broader Impacts
  - Solicitation-specific Criteria
- Recommendation of the Program Officers





# Merit Review: Intellectual Merit & Broader Impacts

1. What is the potential for the proposed activity to:
  - Advance knowledge and understanding (intellectual merit)?
  - Benefit society or advance desired societal outcomes (broader impacts)?
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale?
4. Does the plan incorporate a mechanism to assess success?
5. How well qualified is the individual, team, or institution to conduct the proposed activities?
6. Are there adequate resources available to the PI (either at the home institution or through collaborations) to carry out the proposed activities?



# More ways to find opportunities

- Organizational unit and solicitation-specific mailing lists/newsletters
  - CISE: [https://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=303518](https://www.nsf.gov/news/news_summ.jsp?cntn_id=303518)
  - IIS: [https://www.nsf.gov/news/news\\_summ.jsp?cntn\\_id=299358](https://www.nsf.gov/news/news_summ.jsp?cntn_id=299358)
  - SaTC: <https://www.nsf.gov/pubs/2015/nsf15010/nsf15010.jsp#q48>
- Talk to folks in your area
- Dear Colleague Letters
  - Often one-time requests for ideas in specific areas
  - Found in <https://www.nsf.gov/publications/>



# More ways to find opportunities

- Subscribe to NSF pubs
  - <https://www.nsf.gov/publications/>
  - “Program announcements and information”
  - Helpful to know where the new action is
- Browse and search funding opportunities
  - <https://beta.nsf.gov/funding/opportunities>



# Other gotchas in writing proposals

- Ignoring requirements stated in the solicitation or PAPPG.
- The “Trust Me” approach. Provide citations or evidence for critical assertions made, and details of work.
- The “Oversell” of yourself or your project. Persuade with the quality of the proposal, not glitzy/sales language.
- General, vague, or rambling narrative; low precision/details.
- Too much background/prior work, not enough on what will actually be done.
- More advice (and materials): [NSF CISE CAREER Workshop](#)



# Questions

