ACCESS | Advancing Innovation

National Cyberinfrastructure

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ACCESS Allocations

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There is no Cyberinfrastructure, or Supercomputer without *People*

The People Powering CI

- Datacenter
  - Technicians: Maintain and troubleshoot hardware
  - Engineers: Design and optimize data center infrastructure
  - Plumbers: Liquid cooling manifolds
  - Electricians: Powering up the room and racks
- Operations/Networking/Security
  - System Administrators: provisioning and monitoring nodes
  - Network Administrators: Ensure reliable and secure network operations
  - Security: Protect systems from cyber threats
- Account Management and Accounting
  - Creation and maintenance of groups and individual accounts, along with resource accounting
  - Accountants: Manage financial records and budgets.
- User Support
  - Technicians: Provide front-line technical assistance to users.
- Scientific Support
  - Research Scientists: Collaborate on scientific projects and data analysis
  - Technical Consultants: Offer expertise in specialized scientific domains
- Communications
  - Manage internal and external communications
  - Scientific and technical writers for publications and manuals
- Project Management
  - Oversee project timelines and deliverables and assist in project planning and execution.
- Education, Training, Workforce Development
  - Develop and conduct training sessions and workshops for academics and professionals
- Business Office & Administration
  - Proposals, finances, procurement, coordination
- Librarians
  - Data ingestion, curation, and management
- …

National Cyberinfrastructure: NSF-Funded ACCESS Program

National Cyberinfrastructure Program

2001 - 2011

https://en.wikipedia.org/wiki/TeraGrid

2011 - 2022

https://www.nsf.gov/news/news_images.jsp?cntn_id=121181&org=NSF

2022 -

https://access-ci.org

A-C-C-E-S-S

- **A**dvanced **C**yberinfrastructure
- **C**oordination **E**cosystem
- **S**ervices & **S**upport

- Beyond-your-laptop → supercomputers; data storage; datasets; models; software
- Rich collection of NSF-funded resources working together
- Services: Requesting accounts; operating equipment; reporting/metrics
  Support: Assistance; training; consulting

“Outgrowing” Your Laptop

When and why to use shared cyberinfrastructure resources:

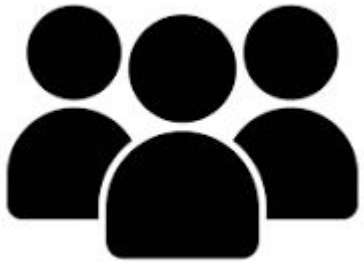
- If your tasks for research and/or coursework should take minutes but are taking hours or days to complete
- If your laptop regularly freezes due to high computational loads
- If the laptop’s CPU, memory limitations, and storage requirements are consistently maxed out
  - e.g. when you run out of storage for program
  - e.g. when you don’t have the hardware to run certain software
- When you need to share work with others
  - Collaborative projects
  - Classroom activities

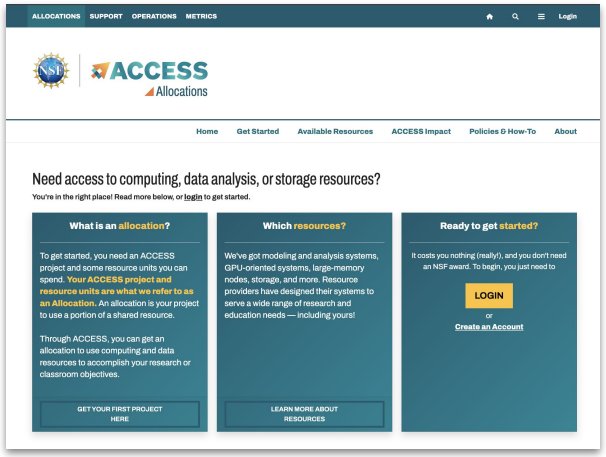
ACCESS Allocations

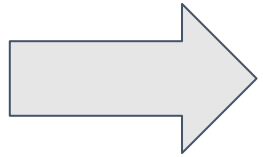
Connecting researchers and educators to the resources and services they need to accomplish their objectives.

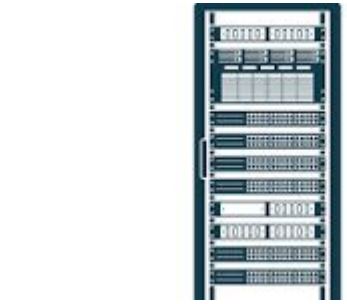
https://allocations.access-ci.org

Research & Educational Community









Cutting-edge Hardware, Software + Expertise

ACCESS Allocations

NSF

Allocation Services Vision & Goals

Allocations Vision: The NSF-funded national CI must be accessible and equitable for all researchers no matter the size of the institution, the scale of the planned work, the discipline of the research, or the demographics of the requestor.

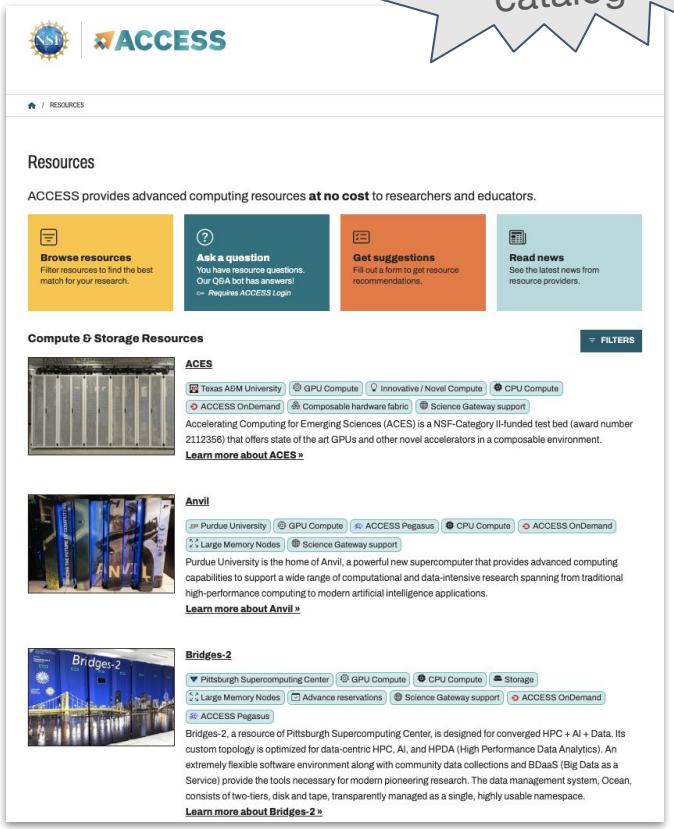
Our Goals:

- Create an **open, inviting, and democratized allocations marketplace**
  - With our emphasis on continuous improvement and democratization
- …with an **efficient, scalable, and simplified request and review framework**
  - Through our policies and procedures
- …built on a **robust, decentralized, and flexible software platform**
  - Made possible by the eXtensible Resource Allocation System (XRAS)

Cyberinfrastructure Available

Check out the new catalog!

- Computing systems
  - Varying core counts & memory sizes
  - Cloud resources (persistent services)
- Accelerators
  - GPUs, vector processors, FPGAs
- Data storage systems
  - Archival, object, tiered
- Data repositories
- Software & workflow managers
- High performance networking
- CI Professionals & support tools
- System performance monitoring



Browse all available resources:
https://allocations.access-ci.org/resources

Science Gateways

- User-friendly web-based portals or platforms developed by a community that provide researcher and educators with access to advanced computing resources, data, software, and tools.
- Over 40 active community gateways currently running on ACCESS resources
  - **Domains**: quantum chemistry, genomics, computational anatomy, cryo-EM, climate research, music education research, earth and planetary materials, water education, natural hazards engineering, biomedical research, flood monitoring, proteomics, topography, protein structure, and more!
    - See all active Science Gateways powered by ACCESS

Requesting a Project

Simplified Request & Review Framework

- ***Explore ACCESS*** — ***for getting started***, evaluating resources, and small-scale activities
  - Only requires an abstract, reviewed by RPs for suitability
- ***Discover ACCESS*** — for ***modest-scale work***, large classroom exercises
  - One-page write-up, reviewed by RPs for suitability
- ***Accelerate ACCESS*** — for more experienced researchers with mid-scale needs
  - Three-page proposal, subject to panel and RP review
- ***Maximize ACCESS*** — for largest-scale projects, continued close scrutiny of most demanding computational work
  - 10-page proposal subject to panel and RP review

Policies and practices are designed for easier entry.

RPs are engaged in each request for their resource(s).

ACCESS Allocations Policies

- U.S.-based investigators are eligible to lead projects
- Graduate students can now lead projects
- Multiple supporting grants? → Multiple projects
  - Separate projects for research, exploration, and classroom activities
- Standardized project types for flexibility
  - The “paperwork” required to request a project ranges from:
    - 1 paragraph; 1 page; 3 pages; 10 pages
      - **Start small and upgrade later**
- Award duration aligns with supporting grant

Policies and practices are designed for easier entry.

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Available at no cost!

No supporting grants required!

Ecosystem Access Time

A "typical" project now takes ~10 days to go from submitting a project request to recording their first use of an ACCESS resource.

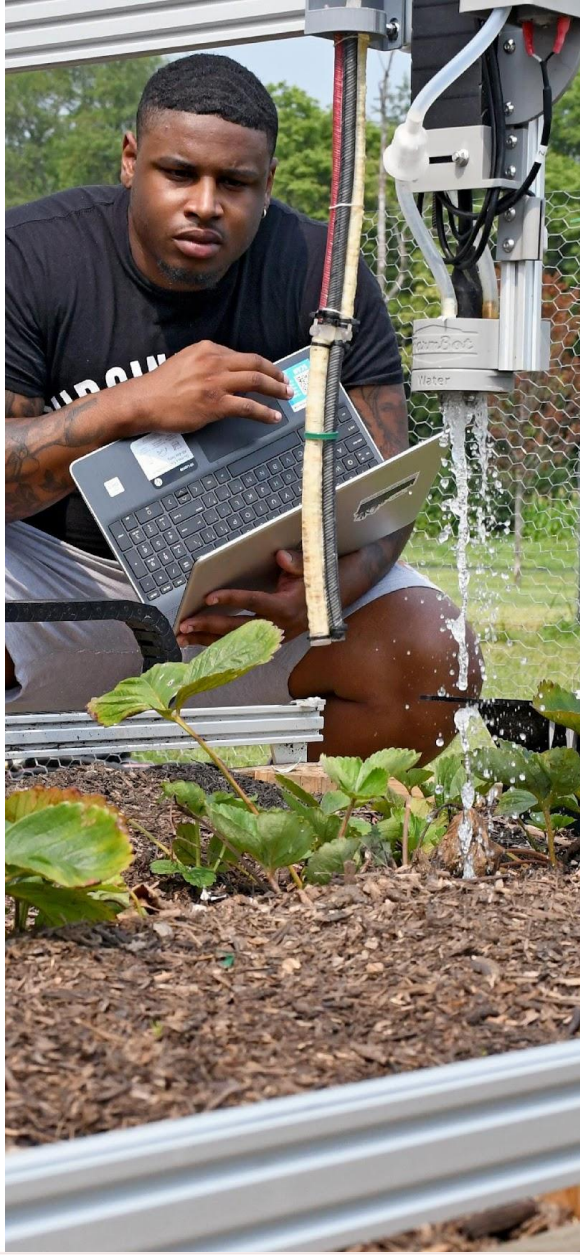
Accounts on resources are available in ~3 days.

KPI: Ecosystem Access Time (days)	2022 12.8	2023 10.5
Preparation time (satisfaction)	*4.1*	*4.23*
Preparation time (days)	-	0.6
Median days to request decision	0.6	0.7
Median days to first credit exchange	4.0	1.9
Median days to approved exchange	1.1	1.0
Median days to first resource use	7.1	6.3

Step-by-Step Allocations Request

- Register for an ACCESS ID
- Select the Project Type that best fits your needs
  - If you're new, ***start with Explore*** and upgrade when you need more resources!
- Complete the Request Form
  - Add co-PIs, Allocation Managers, and other Users (make sure they have an ACCESS ID)
- Exchange your allocated credits for the Available Resources
- Start your research, development, or educational (classroom) work!

Link to full "Get Your First Project" guide

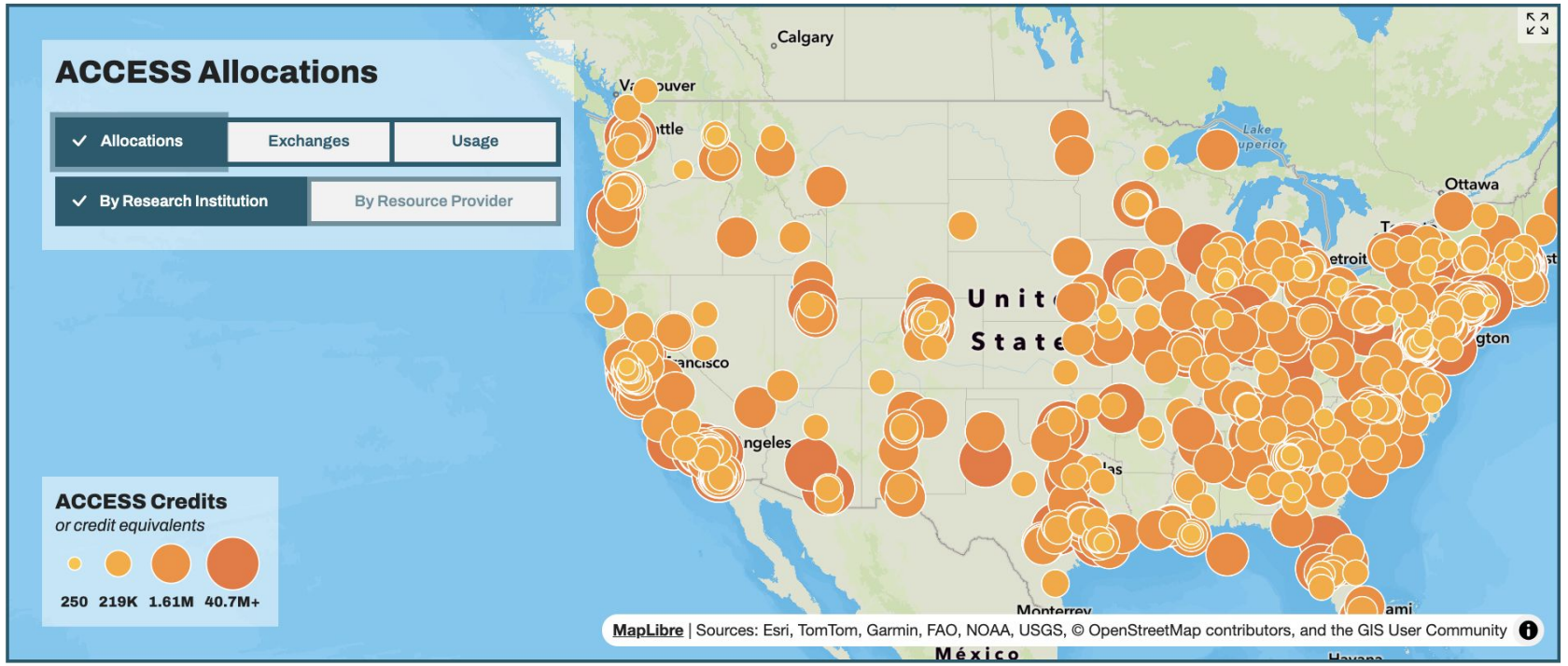


ACCESS Allocations

Over 95% of Requests are Approved!

NSF

Who's Utilizing ACCESS?



[Explore the map](#) for more in-depth information
Check out our [Current Projects](#) page

ACCESS Allocations

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Extending the use of resources and services available via ACCESS to under-represented communities, under-resourced institutions, and non-traditional domains

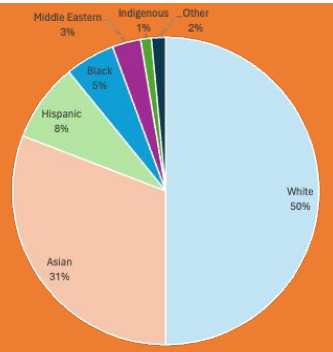
31.4%

Year 2 projects from non-R1 institutions
(ACCESS Central Database)

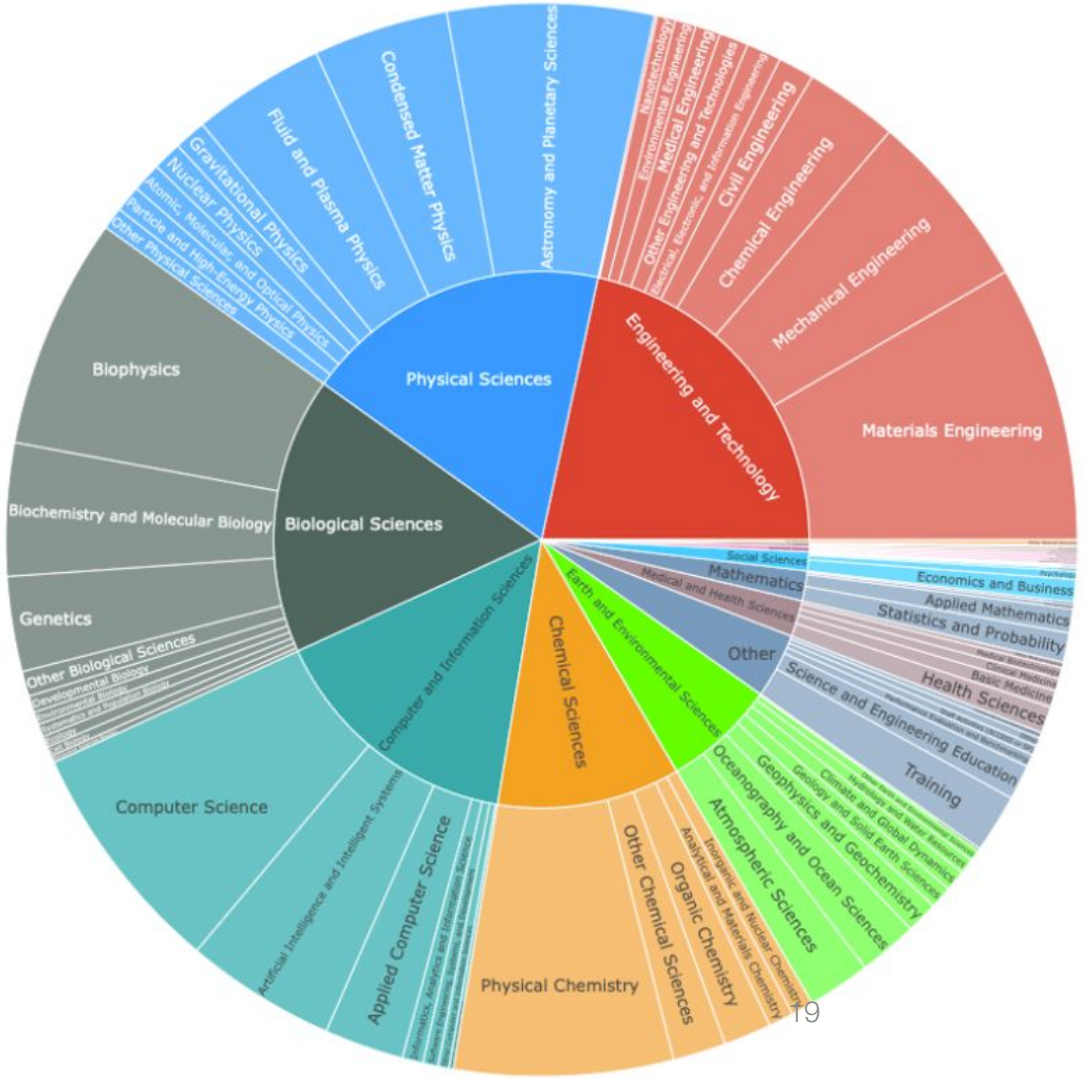
67% male
27% female

Gender diversity
(Community Survey)

Racial diversity



Field of science diversity for ACCESS-allocated projects



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Where to Find Help

Ticket System

- Anything ACCESS related
  - Must register for an ACCESS ID to open a ticket

Resource Providers (Directly)

- The Resource Catalog has links to user guides with contact information

Indiana University (IU)
Jetstream2

Johns Hopkins University (JHU)
Rockfish

National Center for Supercomputing Applications (NCSA)
Delta

Open Science Grid (OSG)

Open Storage Network (OSN)

Pittsburgh Supercomputing Center (PSC)
Bridges-2

Purdue
Anvil

San Diego Supercomputer Center (SDSC)
Expanse

Stony Brook University
Ookami

Texas Advanced Computing Center (TACC)
Stampede2
Ranch

Texas A&M University (TAMU)
FASTER

University of Delaware
DARWIN

University of Kentucky
KyRIC

Q&A Bot

- https://support.access-ci.org/

Contact the Presenter

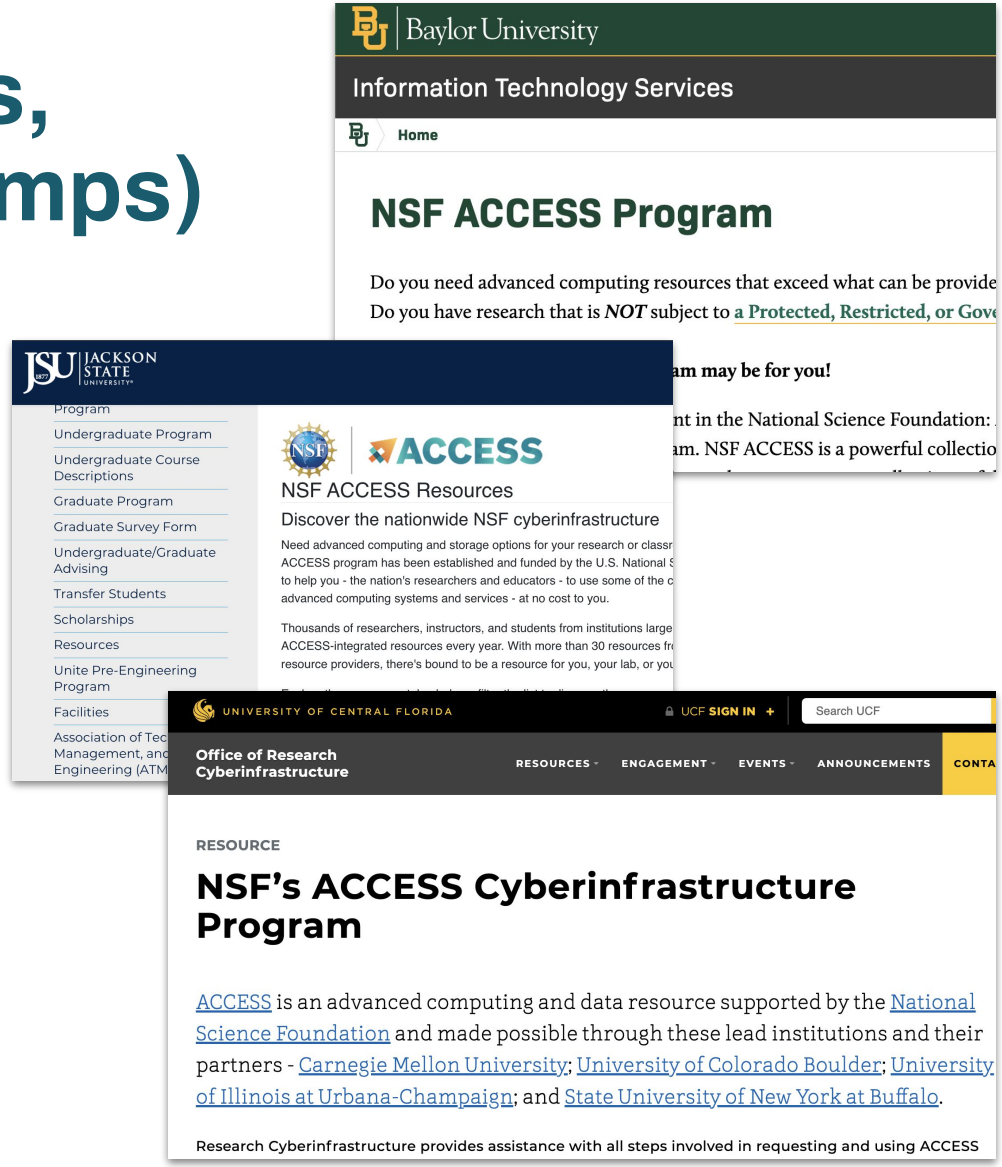
- Drop me a line! (email on last slide)

Bring ACCESS to your Campus, Institution, or Program (On-Ramps)

- Instead of sending your researchers and instructors to the ACCESS website, you can point them to your own!

  https://allocations.access-ci.org/**on-ramps**

- Our initial offering lets individuals browse, filter, and learn about the ACCESS-integrated resources
  - *They jump to the ACCESS website to make a request*
  - *No user information is collected at your end*
- An on-ramp is just an embeddable Javascript component that you can put into any webpage
  - *(14 lines of Javascript)*
- We're looking for campuses to help us beta test the offering and collect feedback



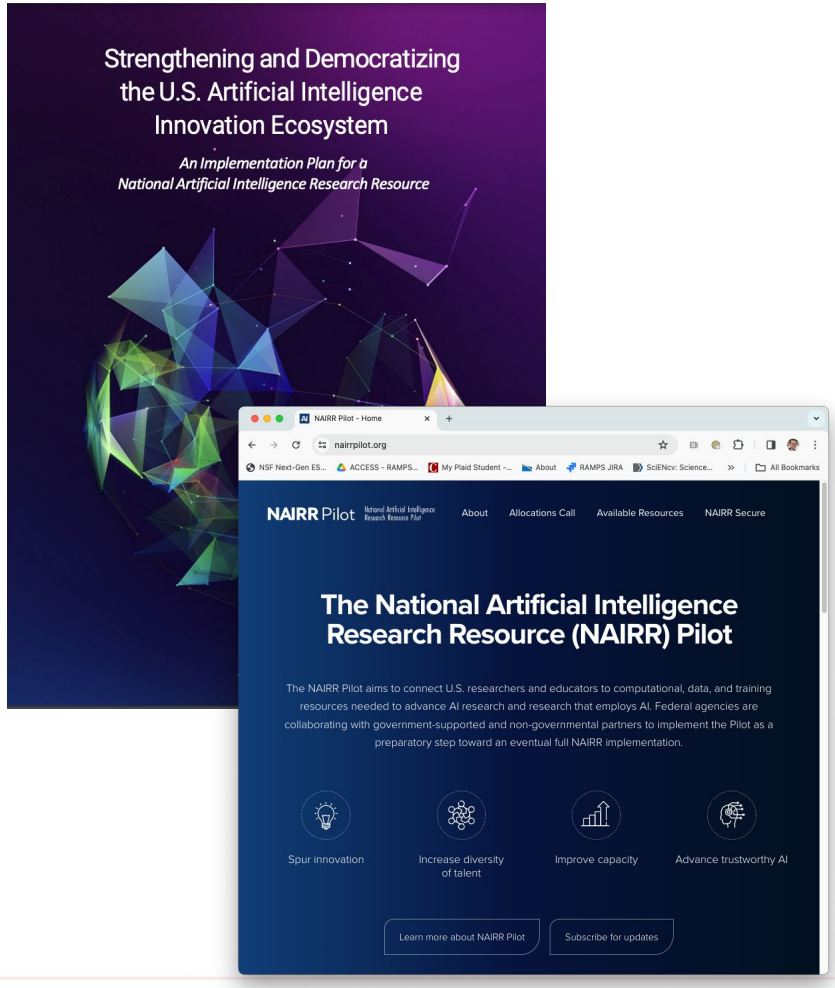
ACCESS Allocations

https://its.web.baylor.edu/nsf-access-program
https://www.jsums.edu/industrialsystems/nsf-access-resources/
https://rci.research.ucf.edu/resource/nsfs-access-cyberinfrastructure-program/

National AI Research Resource Pilot Program

National Artificial Intelligence Research Resource Pilot

- NAIRR Task Force established by National AI Initiative Act of 2020, launched in June 2021, co-chaired by OSTP and NSF
- NAIRR Task Force's final report issued in Jan. 2023
  - Report provides a roadmap for standing up a national research infrastructure
- White House issued Executive Order on Oct. 30, 2023, with 90-day window to launch NAIRR Pilot
  - Among many AI-related directives to federal agencies



Apply for resources at nairrpilot.org

Private Sector Resources in NAIRR

- AI2: Allen Institute for AI
- AMD
- Amazon Web Services (AWS)
- Anthropic
- Cerebras
- Databricks
- Datavant
- EleutherAI
- Google
- Groq
- Hewlett Packard Enterprise (HPE)
- Hugging Face
- IBM
- Intel
- Meta
- Microsoft
- MLCommons
- NVIDIA
- Omidyar Networks
- OpenAI
- OpenMined
- Palantir
- Regenstrief Institute
- SambaNova Systems
- Vocareum
- Weights & Biases

NAIRR Pilot Allocations Process

- https://nairrpilot.org
  - Research & Educational Calls currently open
- Must have an ORCID ID to start the submission process
  - https://orcid.org/register
- 3-page request
- Must be computing in the U.S.
- Multi-step allocations process
  - Request -> Vetting -> Review -> Matching -> Agency Concurrence

Which Do I Choose? ACCESS or NAIRR Pilot?

- ***Long-term*** research and educational initiatives
- All project types
  - not explicitly AI-related
- Mainly *CPU, GPU, Storage* resources
- Most (83%) projects approved in ~**1 business day**
  - Accounts on resources available in ~3 days

- ***Short-term*** projects with immediate results
- AI-focused projects only
  - should align with current focus areas: https://nairrpilot.org/opportunities/allocations
- Diverse set of resources
- Requests take ~**6-8 weeks** for review and processing

Thank you!

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access-ci.org