

Webcast on Solicitation NSF 23-506 Expanding AI Innovation through Capacity Building and Partnerships (ExpandAI)

NSF Mission:

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











Webinar Outline

Part I: NSF Overview

Part II: Al Institutes Program Overview

Part III: Expand Al Program Overview

Part IV: Concept Outlines

Part V: Eligibility – CAP & PARTNER Proposals

Part VI: Proposal Preparation and Submission

Part VII: Capacity Building Pilots - CAP

Part VIII: Partnerships – PARTNER

Part IX: Expand AI - Important Dates

Q&A

Part I: NSF Overview

FAST FACTS



1950

Year Congress created NSF

\$8.5B

NSF's approximate annual budget

94%

Percent of budget committed to research, education and related activities

12,200

Number of awards NSF funds each year

\$200M

Amount NSF awards annually to small businesses to move discoveries into the marketplace

\$1.4B

NSF spending each year on STEM education and workforce development

248

Number of Nobel Prize winners who received NSF funding



World-class science is shaped by a wide range of perspectives. Our nation needs every person who is interested in pursuing a STEM career to be able to do so.

- **Dr. Sethuraman Panchanathan**Director of the U.S. National Science Foundation

8 NSF Directorates:





ENG



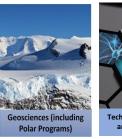
MPS



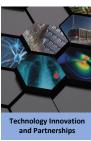
CISE







GEO



TIP

➤ NSF Solicitations are organized by NSF Unit (Directorate, Division) or Program

> Some Solicitations are cross-cutting, spanning multiple units e.g. NSF 23-506 ExpandAl

Part II: Al Institutes Program

National Al Strategy

- Sustained, long-term support
- Maintain and grow U.S. Leadership in Al
- Core missions:
 - 1. advance fundamental knowledge of AI;
 - 2. advance use-inspired work to solve real-world problems of importance to the U.S. economy
 - grow the U.S. Al workforce and build pathways for students from diverse backgrounds.



National AI R&D Strategic Plan

Al Institutes: multisector collaboration featuring Government + Academia and their partners in the Institutes





















for Resilient Agriculture











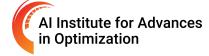


























National AI Research Institutes Program NSF 22-502

- NSF and USDA-NIFA 18 Al Research Institutes funded as of October 2022
- Broad spectrum of AI research: foundational and useinspired
- Critically important to US competitiveness, food security, public safety, education, etc.
- Currently six thematic areas:

Theme 1: Next-Generation Cybersecurity

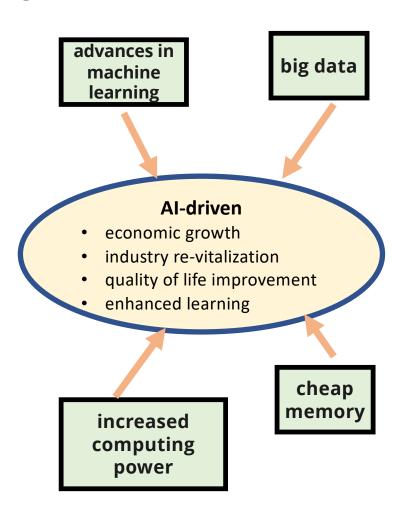
Theme 2: Neural/Cognitive Foundations of Al

Theme 3: Al for Climate-Smart Agriculture and Forestry

Theme 4: Al for Decision Making

Theme 5: Trustworthy Al

Theme 6: Al-Augmented Learning







Al Institute for Artificial

Interactions



IFML

Al Institute for Foundations of

Machine Learning











AI INSTITUTE IN DYNAMIC SYSTEMS **Dynamics Al** Al Institute for Dynamic

ENGAGE AI Al Institute for Engaged Learning

AI-ALDE AI-ALOE

Al Institute for Adult Learning and Online Education

AI2ES rustworthy AI in Weather, Climate, and Coastal

Al Institute for Advances in Optimization

AI40PT

Al Institute for Advances in

AgAID Decision Support

AgAID

Institute for Agricultural Al for Transforming Workforce and



EDGE Institute

AI CARING

Assistance and Responsive

AI CARING

AI-EDGE

Networks and Distributed Agricultural Resilience Intelligence Management, and Sustainability

AIFS AIFARMS

AIFARMS

AIFS Food Systems



MMLI

Al Institute for Molecular Discovery, Synthetic Strategy, and Manufacturing

Funded by NSF



TILOS

Al Institute for Learning-**Enabled Optimization at Scale**

Funded by NSF

19 Institutes, 122 eligible organizations spanning 40 States Will grow in FY23



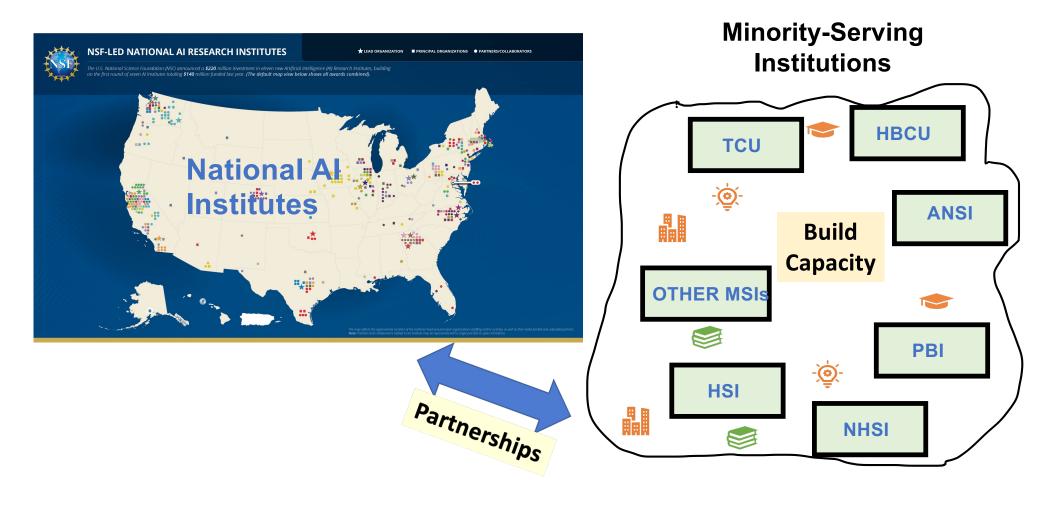
Part III: Expand Al Program Overview

Program Goal:

Diversify participation in AI research, education & workforce development through capacity development and partnerships with National AI Research Institutes

- Minority-serving institutions (MSIs) are a source of untapped talent critical to future AI innovation and responsible AI research through inclusive participatory design
- Where MSIs are not yet significantly engaged in AI research and education there is enormous potential to develop talent through federally supported AI research
- ExpandAl promotes capacity development for new Al programs at MSIs, as well as partnerships between MSIs and Al Institutes

MSI Capacity Building & Partnership with AI Institutes



ExpandAl Program Rationale

- NSF supports growth of interdisciplinary research by diverse community for advancement of Al-driven innovation
- Program promotes

Capacity development for new Al programs at MSIs

Partnerships between MSIs and AI Institutes

Flexible Approach, Recurring Contiguous Submission Windows (no single date deadline)



MSI-specific goals Institution support Path to partnership



MSI-led awards
Institute subawards
Shared vision and goals
Institute integration plans



Concept outlines
Submission windows
Flexible submissions

Expand Al Program (NSF 23-506)

WEBINARS Thur Feb 16, 2023, at 2pm-3.30pm EST Thur Mar 16, 2023, at 2pm-3.30pm EST Register in advance at: omgov.com/webinar/register/WN_eFcqrhKCRYm

Concept Outline (2 pages)

Proposal Submission



Two Tracks



Planning/Growth efforts Exploration of future partnerships

Expected Outcomes

- enhancement of foundational or use-inspired AI research
- academic pathways for AI teaching and learning
- enhanced AI research infrastructure
- increase in participation of underrepresented investigators

Track 2: Partnerships

Scale up established AI research, education programs, initiate new collaborations

Expected Outcomes

- enhancement of existing/initiation of new projects by virtue of new collaboration
- community building activities to further develop common interests
- potential and plans for scaling nascent programs;
- evaluation plan for measuring growth and mutual benefit of activities

\$400,000 for up to 2 years **Continuing Grants**

Recurring submission windows in 2023 Jan 9, 2023 - Mar 13, 2023 Mar 14, 2023 - Jun 26, 2023 June 27, 2023 - Oct 20, 2023

\$300,000 - \$700,00 per year for up to 4 years **Standard Grants**

VIRTUAL OFFICE HOURS

Tues Feb 21, 2023, 2-3pm

Tues Mar 21, 2023, 2-3pm

Tues April 18, 2023, 2-3pm

Tues May 16, 2023, 2-3pm Tues June 20, 2023, 2-3pm

Estimated Program Budget FY 2023

Overall: \$10-17million available to support 15 – 25 awards:

- 10-15 Capacity Building Pilots (CAP) awards
- 5-10 Partnership (PARTNER) awards
- CAP award standard grant up to \$400,000 total budget over two years
- PARTNER award continuing award in the range of \$300,000 to \$700,000/year for up to 4 years

ExpandAl Participating Agencies

NSF Units



- Directorate for Biological Sciences (BIO)
- Directorate for Computer and Information Science and Engineering (CISE)
- o Directorate for Education and Human Resources (EDU)
- Directorate for Engineering (ENG)
- Directorate for Mathematical and Physical Sciences (MPS)
- Directorate for Technology, Innovation and Partnerships (TIP)











How AIVO supports ExpandAI



Hundreds of eligible MSIs

Partnership Inquiries Resource Search





Facilitator and Resource Center

- Directory of Institute contacts
- Advice on partnership inquiries
- Future: Resources for capacity development activities?

https://aiinstitutes.org/institutes/ExpandAI/



18 Institutes, **122 eligible organizations**Will grow in FY23

EDGE Institute

ExpandAl Program Contacts

- · Jim Donlon, CISE/IIS, ExpandAI Program co-lead
- · Abby Ilumoka, EHR/DUE, ExpandAI Program co-lead
- Neeti Pokhriyal, CISE/IIS, Science Fellow, AI Institutes
- Rebecca Hwa, CISE/IIS (AI Institutes Program co-lead)
- Michelle Rogers, CISE/EWF (ExpandAI co-author)
- Subrata Acharya, CISE/EWF
- Rebecca Shearman, TIP/ITE (ExpandAI co-author)
- Jeremy Guinn, EHR/HRD (ExpandAI co-author)
- Amy Baylor, EHR/DRL (ExpandAI co-author and AI Institutes PO)
- Christine Grant, ENG/EEC (ExpandAI co-author)
- Kemi Ladeji-Osias, ENG/EEC (ExpandAI co-author)
- Aranya Chakrabortty, ENG/ECCS
- Shahab Shojaei-Zadeh, ENG/CBET (ExpandAI co-author and AI Institutes PO)
- Stacey Levine, MPS/DMS (ExpandAI co-author)
- Andreas Berlind MPS/AST (ExpandAI co-author)

ExpandAIProgram@nsf.gov

Part IV: Concept Outlines

Concept Outlines

- All proposers must receive an official invitation via the Concept Outline process to submit a full proposal to the solicitation
- Two-page Concept Outline gives NSF the ability to review for appropriateness to the program objectives prior to the full proposal submission process
- This ensures that proposers do not expend time or resources preparing full proposals that do not have strong potential to be responsive to program objectives
- Concept Outlines are required for both tracks (CAP and PARTNER)
- Concept Outlines may be submitted by an eligible PI and are reviewed on an ongoing basis (no limit on # of Concept Outlines per institution)
- Send Concept Outline as PDF attachment in email to: ExpandAlProgram@nsf.gov
- For PARTNER concepts, cc: one co-PI for each AI Institute
- Format SUBJECT: "CO: [Title as appears in Concept Outline]". (e.g., "CO: CAP: Al Capacity Building in XYZ University").

Eligibility & Review of Concept Outlines

- Eligibility to Submit Concept Outline: Concept Outlines may be submitted by any eligible PI in the organization
- NSF will review Concept Outlines on an ongoing basis for potential to be responsive to ExpandAl program objectives
- NSF will respond to submitter with a Program Officer Concurrence Email as invitation to submit a
 full proposal within 12 months of date of email
- Proposer that has received an invitation to submit a full proposal must wait for that proposal to be submitted and resolved before submitting another Concept Outline.
- If the Concept Outline is not responsive to ExpandAl program objectives, proposer will receive notice not to submit a proposal
- Proposers <u>not invited to submit</u> a full proposal in response to a Concept Outline may submit a new Concept Outline after the start of the next submission window (sooner, by exception, if specifically invited by the program)
- Proposers who do not receive an invitation to submit a proposal are not eligible to apply for ExpandAl funding. Proposals will be RWR

Anatomy of a Concept Outline

- Five key elements:
- 1. TITLE: [CAP or PARTNER]: Concise, descriptive title of project
- 2. Names of Pls/Co-Pls: List up to five. For PARTNER concepts, include the prospective co-Pl from relevant Al Institute
- 3. MSI STATUS: (all concept outlines) Describe the lead institution's MSI status and address the relevant requirements for Eligible Institutions of Higher Education
- **4. CURRENT AI CAPACITY:** (250 words) Briefly describe the lead institution's AI capacity in research, instruction, and infrastructure as it relates to the proposed concept. For concepts targeting Track 1 CAP, demonstrate a compelling institutional need for capacity building in AI. For concepts targeting Track 2 PARTNER, describe a suitable foundation for success in the collaboration described in Partnership Goals.

5. GOALS:

• CAPACITY BUILDING GOALS: (required for CAP, optional for PARTNER, up to 500 words). Describe outcomes and benefits of capacity building. Outline goals and any preliminary plans that might be fully described in the full proposal's Capacity Building Plan.

OR

• PARTNERSHIP GOALS: (required for PARTNER only, up to 500 words). Identify the organizations and their prospective collaborative work in some unifying theme or focus. Outline shared goals of the organizations and identify any prospective projects and collaborative arrangements that might be fully described in the Full proposal's Partnership Roadmap. Also describe any initial commitments to participate obtained from relevant Al Institute Director

Part V: Eligibility - CAP & PARTNER Proposals

Institutional Eligibility

ExpandAl proposals may be submitted only by accredited Institutions of Higher Education (IHEs) that belong to at least one of the following 7 MSI classifications:

- 1. Alaska Native Serving Institutions (ANSI) Accredited IHEs that award bachelor level degrees that have a 20 percent or greater enrollment of Alaska Native undergraduate students.
- 2. Hispanic Serving Institutions (HSI) Accredited IHEs that award bachelor level degrees that have a 25 percent or greater full-time equivalent enrollment of Hispanic undergraduate students
- 3. Historically Black Colleges and Universities (HBCU) Identified in the Higher Education Act of 1965, as amended, as any accredited historically black college or university that was established prior to 1964, whose principal mission was, and is, the education of Black Americans
- 4. Predominantly Black Institutions as defined by the Department of Education that award bachelor level degrees

Institutional Eligibility (contd.)

- 5. Native Hawaiian Serving Institutions (NHSI) Accredited IHEs that award bachelor level degrees that have a 10 percent or greater enrollment of Native Hawaiian undergraduate students
- 6. Native American-serving, non-Tribal Institutions and Tribal Colleges and Universities (TCU) see solicitation
- 7. Other Minority-Serving Institutions (MSI) Accredited IHEs that award bachelor level degrees that have an aggregate undergraduate enrollment of African Americans/Blacks, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders exceeding 50 percent of total undergraduate enrollment

PI Eligibility

Who May Serve as PI:

- The Principal Investigator must hold a full-time faculty appointment or be a senior administrator at an eligible Institution as defined in the 'Eligible Institutions of Higher Education' section of the solicitation.
- In PARTNER proposals only, a co-PI must be identified to represent each partnering AI Institute. That co-PI must be verified by the Institute Director in the Institute Integration Plan as being among the senior personnel of the institute at the time of submission.

Part VI: Proposal Preparation and Submission

Proposal Submission (CAP & PARTNER)

- The ExpandAI program has recurring proposal submission
 windows. Unlike deadlines, submission windows allow proposers the
 flexibility to submit a full proposal at any time during the specific
 dates listed
- On each submission window closing date, the proposal submission system will shut down at 5:00 p.m. submitter's local time.
- The system will then reopen for new submissions the morning of the next window, with the exception of the final submission window.

Limit on Number of Proposals per Organization

- An organization may submit one proposal per submission window. An organization must wait for a determination from NSF (e.g., Award, Decline, or Returned Without Review) on the pending proposal before submitting a new proposal in the next window.
- Declined proposals require a new invitation to submit (via the Concept Outline process) and significant revision, while proposals Returned Without Review may be submitted using the same invited Concept Outline (assuming that the proposal is received within one year of the original Concept Outline invitation)
- Also, an organization that has received an invitation to submit a full proposal must wait for that proposal to be submitted and resolved before submitting another Concept Outline
- Limit on Number of Proposals per PI or co-PI: There are no restrictions or limits.

Proposal Submission - Window Dates

(due by 5 p.m. submitter's local time)

Eligible MSIs can submit a Concept Outline at any time. MSIs that have been invited to submit a full proposal can submit a proposal based on the Concept Outline at any time during one of the submission windows listed below:

Proposal Submission Windows

- January 09, 2023 March 13, 2023
- March 14, 2023 June 26, 2023
- June 27, 2023 October 20, 2023
- January 08, 2024 March 11, 2024
- March 12, 2024 June 24, 2024
- June 25, 2024 October 18, 2024
- January 06, 2025 March 10, 2025
- March 11, 2025 June 23, 2025
- June 24, 2025 October 17, 2025

Preparation of Full Proposals

For CAP and PARTNER proposals:

- Full Proposals submitted via Research.gov *NSF Proposal and Award Policies and Procedures Guide* (PAPPG) guidelines apply. The complete text of the PAPPG is available electronically on the NSF website
 - at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=pappg.
- Full Proposals submitted via Grants.gov: NSF Grants.gov Application Guide: A Guide for the Preparation and Submission of NSF Applications via Grants.gov guidelines apply (Note: The NSF Grants.gov Application Guide is available on the Grants.gov website and on the NSF website at: https://www.nsf.gov/publications/pub_summ.jsp?ods_key=grantsgovguide).

Proposal Administration Schedule

- Concept Outlines will be reviewed by NSF and a response provided within about 3 weeks
- Cap Proposals will be ad-hoc reviewed and a response provided within 3 months of receipt
- PARTNER proposals will be reviewed within 6 months of receipt

Part VII: Expand AI Capacity Building Pilots - CAP

Track 1: CAP Proposals

- Capacity Building Pilots (CAP) are planning and growth efforts focused on the establishment of AI activities at the funded MSI and the early exploration of future synergistic partnerships that have the potential to be part of prospective ExpandAI Partnerships.
- Successful pilots will result in establishing new AI research capacity, education/workforce development in AI, and/or AI infrastructure capacity at the proposing institution and, potentially, a basis for future AI partnerships.
- CAP activities should plan for engaging appropriate communities to test the feasibility of partnerships as well as developing plans for continuing capacity development.
- Plans should consider required research infrastructure, plans to leverage established groups in related research areas, and inclusion of faculty training and research experiences that emphasize the diversification of investigators.

Track 1: CAP Proposals (contd)

- Proposals must articulate a clear vision motivating the capacity building activities, with a focus on long-term benefits to the MSI
- Benefits to MSI include enhanced faculty capacity for foundational and/or useinspired AI research or new effective models for increased education and career pathways in AI.
- Proposals to this track must include a strong *Institutional Need and Support Statement* containing
- (i) an assessment of the current AI research and instructional capacity and infrastructure, a demonstration of institutional need for capacity building in AI
- (ii) a statement of the commitment of institutional support for the proposed activities.
- Proposals that substantiate a strong case in the need and support statement are likely to be the most competitive.

Track 1: CAP Proposals (contd.)

Successful proposals will feature a *Capacity Building Plan* that features clear and measurable outcomes/benefits of capacity building. Suitable activities for such a plan are:

- establishment or significant enhancement of foundational or use-inspired AI research, marked by increased faculty research output;
- design of academic pathways or innovative models for teaching and learning in AI, incorporating how students learn
 effectively in AI activities, and bringing AI disciplinary advances into the undergraduate and graduate experience;
- establishment or significant expansion of AI career pathways for students resulting from new AI activities;
- enhanced AI research infrastructure;
- significant increase in the participation of investigators and students who have been traditionally underserved and underrepresented in AI; and
- a plan for objective process evaluation in support of the proposed efforts.

Above list is representative of suitable activities and outcomes for CAP track, however, activities need not be limited to this list, and proposals do not have to include every type of outcome represented in list. Proposers are encouraged to select and integrate the activities most appropriate for their institutional context and their vision for capacity building toward partnerships.

Early partnership development between the proposing MSI and one or more AI Institutes is neither required nor encouraged in a CAP proposal.



Track 2: PARTNER Proposals

- PARTNER track is an opportunity for MSIs to scale up already-established AI research and/or education programs and to initiate/leverage new collaborations with AI Institutes.
- Partnerships must reflect multi-organization collaborations submitted by an MSI and will include a subaward to an AI Institute.
- PARTNER projects are centered around shared, complementary goals.
 Proposals will be submitted as single-organizational collaborative proposals.
- Proposing MSI in this track is not required to have previously been awarded a CAP project under this program

PARTNER Proposals

PARTNER proposals:

- must include collaboration with one or more AI Institutes, or with any of the collaborative organizations directly funded under an AI Institute award
- collaboration(s) must be proposed in form of subaward(s) under lead institution
- PARTNER proposals must constitute an <u>authentic</u> and <u>significant new</u>
 partnership that has the clear potential to build on the institution's current Al
 capacity as well as leverage the intrinsic strengths and talents of the MSI

PARTNER Proposals Organizations Eligible as Al Institutes SubAwardees

- Subaward(s) may be made to the AI Institute lead organization or any of the sub-awardee organizations in that Institute's award budget
- Current Al Institutes: A listing of Institutes and links to their web sites can be found at Al Institutes Virtual Organization (AIVO)



PARTNER Proposals (contd.)

- MSIs applying for PARTNER track must demonstrate readiness to leverage external expertise and financial resources to focus on medium- and longrange plans to leverage new partnerships to develop AI capacity
- This may include (but is not limited to) further development of the MSI's envisioned methodological thrusts, use cases, educational and/or workforce development activities, and the potential for the MSI to expand and scale these efforts through formal, mutually beneficial partnerships.
- PARTNER proposals must feature a compelling Partnership Roadmap for collaborative work in some unifying theme or focus

Effective Partnership Roadmaps

- Effective roadmaps should be depicted visually (e.g., conceptual diagram, logic model, table, etc.) as well as fully explained by a descriptive narrative.
- Specifically, Roadmaps might address:
- i. enhancement of existing projects by virtue of new collaboration;
- ii. initiation of new projects made possible by the collaboration;
- iii. community building activities (e.g., workshops) to further develop common interests, objectives, and further growth of the partnership;
- iv. potential and plans for scaling nascent programs;
- v. an evaluation plan for measuring the growth and mutual benefit of activities in all projects.

PARTNER Proposals (contd.)

- Proposals to this track must include a strong Institutional Need and Support
 Statement from proposing MSI which demonstrates institutional commitment
 for proposed activities as well as contain an assessment of
- (i) current AI research and instructional capacity infrastructure
- (ii) progress in AI capacity development and how that relates to the outlook for partnership development
- PARTNER proposals must include an *Institute Integration Plan* submitted by the collaborating institute demonstrating thoughtful and well-resourced commitment to coordination mechanisms that will bring together the various participants of the project.

Part IX: ExpandAl Important Dates



ExpandAl Upcoming Events (all times EST)

Webinars

Thur March 16, 2023, 2-3.30pm

Monthly Virtual Office Hours

Tues Mar 21, 2023, 2-3pm

Tues April 18, 2023, 2-3pm

Tues May 16, 2023, 2-3pm

Tues June 20, 2023, 2-3pm

Zoom Links at: https://beta.nsf.gov/funding/opportunities/expanding-ai-innovation-through-capacity-building

ExpandAl Program - Useful Links

Program Webpage

https://beta.nsf.gov/funding/opportunities/expanding-ai-innovation-through-capacity-building

Solicitation (NSF 23-506)

https://www.nsf.gov/pubs/2023/nsf23506/nsf23506.pdf

FAQs

https://www.nsf.gov/pubs/2023/nsf23061/nsf23061.pdf

Reviewer Recruitment Survey

https://www.surveymonkey.com/r/ExpandAIReviewrVolunteerSurvey

Public Announcements

https://beta.nsf.gov/news/new-nsf-program-seeks-engage-minority-serving

Thank You for Listening!

