Minority University Research and Education Project (MUREP)

Torry Johnson, MUREP Manager
NASA Headquarters
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NASA STEM ENGAGEMENT

OVERVIEW
VISION
We immerse students in NASA’s work, enhance STEM literacy, and inspire the next generation to explore.

MISSION
We engage students in NASA’s mission

Strategic Goals

Create unique opportunities for a diverse set of students to contribute to NASA’s work in exploration and discovery.

Build a diverse future STEM workforce by engaging students in authentic learning experiences with NASA’s people, content and facilities.

Attract diverse groups of students to STEM through learning opportunities that spark interest and provide connections to NASA’s mission and work.
STEM Engagement Architecture
Enabling Student Opportunities & Contributions

**Strategic Goals**

- **Evidence-based strategies**
  - Create unique opportunities for students to contribute to NASA’s work.
- **Rigorous planning**
  - Build a diverse future STEM workforce by engaging students in authentic learning experiences.
- **Integrated operational model**
  - Strengthen understanding by enabling powerful connections to NASA’s mission and work.

**Scalability to Magnify NASA’s Reach and Impact**

**Beneficiaries of NASA’s STEM Engagement Portfolio**

- K-Elementary School
- Middle School
- High School
- Undergraduate
- Graduate
CONTINUED PROGRESS IN TRANSFORMING STEM ENGAGEMENT

STEM ENGAGEMENT PROJECTS

SPACE GRANT
- National network of 52 Consortia with 850 Affiliate members
- Stimulates cooperative programs among universities, industry, federal/state/local governments
- Encourages interdisciplinary education and research programs
- Incorporates State priorities, needs and goals

ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH
- 28 eligible jurisdictions (states and territories)
- Contributes to development of research infrastructure and capabilities
- Fosters partnerships between NASA research entities, industry, and academic institutions
- Incorporates state priorities, needs and goals

MINORITY UNIVERSITY RESEARCH & EDUCATION PROJECT (MUREP)
- Limited to Minority Serving Institutions (MSI)
- Increases retention of underserved and underrepresented groups in STEM
- Enhances infrastructure at MSIs
- Portfolio with 7 funded elements

NEXT GENERATION STEM (NextGen STEM)
- Informal education and K-12 STEM engagement initiatives aligned to mission priorities
- Richer, more comprehensive STEM engagement opportunities
- NASA’s Museum Alliance

EDUCATIONAL TOOLS AND PLATFORMS
- Focus: Access and Scalability
- Integrated suite of tools and platforms enabling student access/registration and comprehensive data collection
  - NASA STEM Gateway (Phase 1 operational in early FY2021)
  - STEM.NASA.gov
  - Intern.nasa.gov
  - NASA STEM@Home

PERFORMANCE MEASUREMENT & EVALUATION
- Focus: Outcomes and Metrics
- Learning Agenda
- Targeted Studies

STRATEGIC PARTNERSHIPS
- Focus: Scalability
- Strategic and comprehensive approach to foster and stimulate strategic partnerships
- New partnerships strategy kicked off in FY2020

INTEernSHIPS & FELLOWSHIPS
- Enterprise model in extensive collaboration with Mission Directorates and Centers
STEM Engagement Program Investments (FY21)

By far most of NASA’s STEM Engagement Program investments are appropriated towards serving higher education students.
MUREP BACKGROUND AND OBJECTIVES
MINORITY UNIVERSITY RESEARCH AND EDUCATION PROJECT (MUREP)
PURPOSE AND STATUTORY AUTHORITY

AGENCY RESPONSE TO FEDERAL EXECUTIVE ORDERS
FOR MINORITY SERVING INSTITUTIONS (MSIs)

MUREP is established to increase NASA’s responsiveness to federal mandates related to MSIs and underrepresented and underserved communities, including women, girls, persons with disabilities and veterans.

- EO 13779: White House Initiative to Promote Excellence and Innovation at Historically Black Colleges and Universities (HBCU)
- EO 13621: White House Initiative on Educational Excellence for African Americans (PBI)
- EO 13592: Improving American Indian and Alaska Native Educational Opportunities and Strengthening Tribal Colleges and Universities (TCU/NASNTI)
- EO 13935: White House Hispanic Prosperity Initiative (HSI)
- EO 13515: Increasing Participation of Asian Americans and Pacific Islanders in Federal Programs (AANAPISI / ANNH)
MSIs are federally recognized institutes of Higher Education in the United States (U.S.) that enroll and serve a significant percentage of minority students. These institutions are eligible to receive federal funding under Title III and V of the Higher Education Act of 1965, as amended by the Higher Education Opportunity Act of 2008. Today, there are more than 700 federally designated MSIs that represent approximately 14 percent of all degree-granting institutions of higher education.

**Historically Defined MSIs**
Established with the specific purpose of providing access to higher education for specific minority groups

- Historically Black Colleges and Universities (HBCU)
- Tribal Colleges and Universities (TCU)

**Enrollment Defined MSIs**
Designated by the U.S. Department of Education based on minority student enrollment and financial resources

- Alaska Native-Serving and Native Hawaiian-Serving Institutions (ANNH)
- Asian American and Native American Pacific Islander-Serving Institutions (AANAPISI)
- Hispanic-Serving Institutions (HSI)
- Native American-Serving Nontribal Institutions (NASNTI)
- Predominantly Black Institutions (PBI)
## DEFINING MINORITY SERVING INSTITUTIONS (MSI)

<table>
<thead>
<tr>
<th>MSI Type</th>
<th>Acronym</th>
<th>Federal Recognition</th>
<th>Executive Order</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>Historically Black Colleges and Universities</td>
<td>HBCU</td>
<td>Higher Education Act of 1965</td>
<td>EO 13779 - White House Initiative to Promote Excellence and Innovation at Historically Black Colleges and Universities</td>
<td>Any historically black college or university established prior to 1964, whose principal mission was, and is, the education of Black Americans.</td>
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<tr>
<td>Tribal Colleges and Universities</td>
<td>TCU</td>
<td>Tribally Controlled College or University Assistance Act of 1978</td>
<td>EO 13592 – Improving American Indian and Alaska Native Educational Opportunities and Strengthening Tribal Colleges and Universities</td>
<td>Institutions chartered by their respective Indian tribes through the sovereign authority of the tribes or by the federal government with the specific purpose to provide higher education opportunities to American Indians through programs that are locally and culturally based, holistic, and supportive.</td>
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<tr>
<td>Hispanic-Serving Institutions</td>
<td>HSI</td>
<td>Higher Education Act of 1992</td>
<td>EO 13935 – White House Hispanic Prosperity Initiative</td>
<td>Institutions with 25 percent or more total undergraduate Hispanic full-time equivalent student enrollment.</td>
</tr>
<tr>
<td>Alaska Native-Serving and Native Hawaiian-Serving Institutions</td>
<td>ANNH</td>
<td>Higher Education Act of 1998</td>
<td>EO 13515 – Increasing Participation of Asian Americans and Pacific Islanders in Federal Programs</td>
<td>Alaska Native-Serving Institutions are institutions that have at least 20 percent Alaska Native students. Native Hawaiian-Serving Institutions are institutions that have at least 10 percent Native Hawaiian students. These institutions are collectively referred to as ANNH institutions.</td>
</tr>
<tr>
<td>Asian American and Native American Pacific Islander-Serving Institutions</td>
<td>AANAPISI</td>
<td>College Cost Reduction and Access Act of 2007</td>
<td>Reference EO 13515</td>
<td>Institutions that have at least 10 percent enrollment of Asian American Pacific Islander students.</td>
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<tr>
<td>Native American-Serving, Nontribal Institutions</td>
<td>NASNTI</td>
<td>Higher Education Opportunity Act of 2008</td>
<td>Reference EO 13592</td>
<td>Institutions that have at least 10 percent enrollment of Native American students.</td>
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<tr>
<td>Predominantly Black Institutions</td>
<td>PBI</td>
<td>Higher Education Opportunity Act of 2008</td>
<td>EO 13621 – White House Initiative on Educational Excellence for African Americans</td>
<td>Institutions that serve at least 1,000 undergraduate students; have at least 50 percent low-income or first-generation to college degree-seeking undergraduate enrollment; have low per-full-time undergraduate expenditure in comparison with other institutions offering similar instruction; and enroll at least 40 percent African American students.</td>
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MUREP VISION
To enhance the research, academic and technological capabilities at MSIs by providing authentic student learning experiences related to NASA missions that contribute to a Diverse Future STEM Workforce.
Minority University Research and Education Project (MUREP)
FY 21 – 22 Engagement Portfolio

RESEARCH INFRASTRUCTURE & CAPACITY BUILDING

Mission Driven Research Efforts:
- MUREP Institutional Research Opportunity (MIRO)
- MUREP Aerospace High Volume Manufacturing & Supply Chain Management Cooperative (MUREP High Volume) – ARMD
- MUREP Space Technology Artemis Research (MSTAR) – STMD
- MUREP Ocean Biology and Biogeochemistry (OCEAN) – SMD

Virtual Tools:
- MSI Exchange / Eligibility Listing, Webinars and Training

Curriculum Development:
- MUREP Innovations in Space Technology Curriculum (MISTC)

Indigenous Connections and Engagement:
- MUREP for American Indian and Alaska Native STEM Engagement (MAIANSE)

Digital Badging:
- MUREP Educator Professional Development (EPDC)

PARTNERSHIPS & SUSTAINABILITY

Internal & External Collaboration:
- MUREP INCLUDES – NSF
- MUREP Partnering to Advance Capacity and Technology (MPACT) Pilot
- MUREP Small Business Technology Transfer Research (M-STTR) - STMD

STUDENT ENGAGEMENT

Pre-College STEM Learning Experiences:
- MUREP Aerospace Academy (MAA)
- Upward Bound

Higher Education STEM Learning Experiences:
- NASA Community College Aerospace Scholars (NCAS)
- MUREP Funded Internships & Fellowships

Challenges and Competitions:
- First Nations Launch (FNL)
- MUREP Innovation and Tech Transfer Idea Competition (MITTIC)
- NASA MUREP Innovative New Designs for Space (NASA MINDS)

Awareness Events:
- NASA Days / STEM Conferences
FY21 – 22 MUREP and NASA Mission Directorate Engagement
FY21 – 22 MUREP Engagement
Aeronautics & Space Technology

**MUREP High Volume Manufacturing Supply Chain Management Cooperative (HighVolume)**
- Partnership w/ NASA ARMD to Increase diversity in Aeronautics
- Identify solutions to U.S. supply chain concerns for drone parts and repair
- 3 active awards
- New Solicitation – August 2021

**MUREP Space Technology Artemis Research (M-STAR)**
- Enhancing capabilities of MSIs to participate in Space Technology opportunities
- Planning Grants awarded to 15 MSIs (August 2020)
- **New Implementation Grant:**
  - Up to $250k per year / maximum two years
  - Closed – May 10th Awards in Summer 2021

**MUREP Small Business Technology Transfer Research (M-STTR)**
- Broadening participation of MSIs in STTR
- Increasing MSI competitiveness to respond to STTR Topics
- **New Planning Grant Opportunity:**
  - 8-10 Planning Grants
  - Up to $30k to $50k each
  - Closed – June 11th Awards in Summer 2021

**NASA Road Tour**
- MSI Engagement to showcase STTR opportunities
- NASA Mission Directorates, Prime Contractors, Small Business & Office of Procurement connect w/ MSI leaders
- Next Road Tour – November 2021 at San Jose State (Tentative)
FY21 – 22 MUREP Engagement
Earth Sciences

**MUREP Ocean Biology and Biogeochemistry (OCEAN)**
Building capacity at MSIs to participate in NASA’s SMD / Earth Science research opportunities.

**New Funding Opportunity:**
Up to $250k per year, ~8 awards maximum 3 years

- **Step I:** Proposals Due Dec 18th
- **Step II:** Proposals Due Apr 15th
  - Awards in Summer 2021

**Ground Based Measurement Networks for MSI Engagement**
Introduction of MSIs to Instrument Monitoring
Development of pathways for diverse ESD future workforce

- **RFI – to be released**
  - Schedule - TBA

- **Full Proposals via ROSES**

**Global Learning & Observations to Benefit the Environment (GLOBE)**
Engaging students & the public in hands-on science.

- DEI Tasks Force Action Plan – Presented in July 2020
- DEI Educational resources / webinar series for students.
- Digital accessibility training for GLOBE Community & Teachers.

**Visit GLOBE’s new DEI Blog:**
https://www.globe.gov/globe-community/people/dei-task-force

**MSI Exchange**
MSI Database
Externally available

**Supports online search for:**
- Diverse academic collaborators
- MSI STEM Programs
- Research Capabilities

https://msiexchange.nasa.gov
MUREP Leveraging Technology to Drive Participation
Minority Serving Institutions (MSI) Exchange

The MSI Exchange is a resource that drives collaboration to build capacity and competitiveness of MSIs. The MSI Exchange was designed to meet the needs of NASA missions and has application across public and private sectors.

**Benefits**

- ✔ Provides MSI awareness and connectivity.
- ✔ Powers the search for diverse academic collaborators by amplifying the applied research and areas of expertise of MSIs.
- ✔ Informs partnerships for teaming opportunities and competitive federal awards such as grants, contracts and cooperative agreements.
- ✔ Increases MSI faculty and student involvement in NASA research.
- ✔ Increases the diversity and capabilities of NASA’s future STEM workforce.

**Features**

- STEM Profiles
- Capability Statements
- Official NASA MSI List
- MSI Distribution List
- Advanced Sort and Filter Options
- Training + Professional Development

https://MSIExchange.nasa.gov/
MUREP COMPETITIVENESS STRATEGY
# NASA HBCU COMPETITIVENESS STRATEGY FRAMEWORK

NASA’s Mission is to lead an innovative and sustainable program of exploration with commercial and international partners to enable human expansion across the solar system and bring new knowledge and opportunities back to Earth, and to support growth of the Nation’s economy in space and aeronautics, increase understanding of the universe and our place in it, work with industry to improve America’s aerospace technologies, and advance American leadership.

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<tr>
<th>AGENCY GOALS</th>
<th>HBCU GOALS</th>
<th>HBCU Metrics</th>
<th>Strategies</th>
<th>Tactics</th>
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<tr>
<td><strong>Discover</strong> references NASA’s enduring purpose of scientific discovery by expanding human knowledge through new scientific discoveries.</td>
<td><strong>Goal 1:</strong> Increase the capacity of HBCUs to compete for and receive agency funding and other financial resources.</td>
<td><strong>Metric 1:</strong> Aim to increase the overall agency funding to HBCUs by 10% by end of FY2022.</td>
<td><strong>Strategy 1:</strong> Provide resources to HBCUs to train faculty and administrators for better understanding of proposal preparation, merit review process, and award administration policies and procedures; broaden pool of qualified reviewers to participate in merit review process.</td>
<td>• NASA Solicitation and Proposal Integrated Review System (NSPIRES) and Grants.gov</td>
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<td><strong>Explore</strong> references NASA’s push to expand the boundaries of human presence in space by extending human presence deeper into space and to the moon for sustainable long-term exploration and utilization.</td>
<td><strong>Goal 2:</strong> Increase the amount of funds awarded to HBCUs through competitive grants, contracts and cooperative agreements.</td>
<td><strong>Metric 2:</strong> Aim to increase the number of eligible proposals submitted by HBCUs by 10% by end of FY2022.</td>
<td><strong>Strategy 2:</strong> Drive awareness, inclusion and selection of HBCUs through grants, cooperative agreements and contracts; foster awareness of HBCU research capabilities and notify HBCUs of agency funding opportunities and resources.</td>
<td>• Minority Serving Institution (MSI) Gateway</td>
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<td><strong>Develop</strong> references NASA’s broad mandate to promote the technologies of tomorrow by addressing national challenges and catalyzing economic growth.</td>
<td><strong>Goal 3:</strong> Increase the recruitment/applicant pool of HBCU students and graduates for STEM Engagement and future workforce opportunities.</td>
<td><strong>Metric 3:</strong> Aim to increase the number and percentage of applicants from HBCUs for Internships, Fellowships, Pathways and Permanent hiring opportunities by end of FY2022.</td>
<td><strong>Strategy 3:</strong> Identify opportunities that attract and target candidates of diverse backgrounds while promoting NASA’s workforce inclusion.</td>
<td>• NASA Technology Infusion Road Tour</td>
</tr>
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<td><strong>Enable</strong> references the capabilities, workforce, and facilities that allow NASA to achieve its mission through optimizing capabilities and operations.</td>
<td><strong>Goal 4:</strong> Increase the representation/selection of HBCU students in agency sponsored programs.</td>
<td><strong>Metric 4:</strong> Aim to achieve a 25% increase in internship placement for HBCU students by end of FY2022.</td>
<td><strong>Strategy 4:</strong> Provide internships, fellowships, and other experiences for HBCU students to conduct scientific and technical research and perform design and development activities to fulfill NASA needs and priorities. NASA will create challenges, competitions and other transdisciplinary experiential learning opportunities to enhance STEM student studies.</td>
<td>• Small Business Technology Transfer (STTR)</td>
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<td>• Procurement and Federal Contracts</td>
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<td>• Equal Opportunity and Diversity and Inclusion in STEM</td>
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<td>• Funded Internship and Fellowships</td>
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<td>• Recruitment / NASA Days and Career Fairs</td>
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<td>Mission Directorate Engagement</td>
<td>Agency 1% MSI Prime / Subcontracting Goal</td>
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<td>Drive competitiveness to increase MSI participation in NASA Mission Directorate (MD) opportunities.</td>
<td>Drive competitiveness to increase MSI participation in NASA federal contracts.</td>
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<td>- Understanding MD opportunities</td>
<td>- Federal Contracts Training</td>
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<td>- MD participation in trainings and workshops</td>
<td>- Understanding NASA Contracts Requirements</td>
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<td>- Early stage funding from MDs</td>
<td>- Connecting with NASA small business specialists</td>
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<th>Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)</th>
<th>Training / Partnerships</th>
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<td>Drive competitiveness to increase MSI participation in SBIR/STTR opportunities.</td>
<td>Drive competitiveness to strengthen MSI responses to NASA opportunities.</td>
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<tr>
<td>- Increase access to small business enterprises</td>
<td>- Standardize information levels &amp; Best Practices</td>
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<tr>
<td>- Support proposal development</td>
<td>- Developing Collaborations</td>
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<td>- Provide topics more relevant to MSIs</td>
<td>- Understanding Request for Proposals</td>
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Mission Directorate Engagement

Drive competitiveness to increase MSI participation in NASA Mission Directorate (MD) opportunities.

Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR)

Drive competitiveness to increase MSI participation in SBIR/STTR opportunities.

Agency 1% MSI Prime / Subcontracting Goal

Drive competitiveness to increase MSI participation in NASA federal contracts.

NASA HBCU/MSI Technology Infusion Road Tour at San Jose State University November 2021

Training / Partnerships

Drive competitiveness to strengthen MSI responses to NASA opportunities.
MUREP IN ACTION
INSPIRE - ENGAGE - EDUCATE - EMPLOY
The Next Generation of Explorers

Questions?
FOR ADDITIONAL INFORMATION AND UPDATES, VISIT THE MUREP WEBSITE:

WWW.NASA.GOV/STEM/MUREP

FOR QUESTIONS OR FEEDBACK, CONTACT US:

HQ-MUREP@MAIL.NASA.GOV