Spring MPSAC Meeting

AD OVERVIEW

DR. SEAN L. JONES
Assistant Director
Programmatic Directorates and Offices Supporting the NSF Mission

- Engineering
- Geosciences (including Polar Programs)
- STEM Education
- Social, Behavioral & Economic Sciences
- International Science & Engineering
- Biological Sciences
- Mathematical & Physical Sciences
- Integrative Activities
- Computer & Information Science & Engineering
- Technology, Innovation and Partnerships
NSF Changes in Leadership

BIO Assistant Director
Simon Malcomber (Acting)

SBE Assistant Director
Sylvia M. Butterfield (Acting)

EDU Assistant Director
James L. Moore III

Chief Diversity and Inclusion Officer
Chuck Barber
MPS Position Opening

Announcement Number:
MPS-EXEC-2023-0001

Link to apply
www.usajobs.gov/job/707560000

Posting closes 05/17/23

PHY Division Director
Denise C. Caldwell
NSF’s 3 Major Priorities Align with White House and Congressional Priorities

- Strengthening Established NSF
- Inspiring the Missing Millions
- Accelerating Technology and Innovation
NSF’s 3 Major Priorities Align with White House and Congressional Priorities

- Strengthening Established NSF
- Inspiring Missing Millions
- Accelerating Technology and Innovation

Advance Emerging Industries for National and Economic Security
Build a Resilient Planet
Create Opportunities Everywhere
Strengthen Research Infrastructure
FY 2023 Enacted

• $9.9 Billion
  • +$1.03 billion
  • +11.8% above
  • FY 2022 Current Plan

Signed by the President December 29, 2022
(Current Plan in progress)

Provides NSF with a total $9.876 billion between Omnibus and Disaster Relief Supplemental Act funding.

Disaster Relief Supplement has 3 parts:
• Base activities - $700 million
• CHIPS & Science Set-Aside - $335 million (2 year)
• Damaged Research Facilities and Science Equipment - $2.5 million
<table>
<thead>
<tr>
<th>Amount</th>
<th>Description</th>
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<tbody>
<tr>
<td>$467 Million</td>
<td>TIP Directorate to accelerate technology and innovation and support CHIPS &amp; Science</td>
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<tr>
<td>$225 Million</td>
<td>EDU Directorate to support critical workforce investments and support CHIPS &amp; Science</td>
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<td>$199 Million</td>
<td>Directorate increases to support Inspiring Missing Millions, Emerging Industries, Build a Resilient Plant, Enhance Research Infrastructure</td>
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<tr>
<td>$154 Million</td>
<td>Agency-wide investments including EPSCoR, GRANTED, new class of STCs</td>
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<tr>
<td>$43 Million</td>
<td>AOAM to support agency growth and additional FTE</td>
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<tr>
<td>$27 Million</td>
<td>Expanded role of NCSES in govt-wide leadership of statistical agencies</td>
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FY 2023 Enacted

Leading With Strategic Investment Decisions

NSF is also investing in Congressional and Administration priorities, such as:

- EPSCoR and equity programs
- Global leadership in addressing **climate** issues
- Research security
- Emerging industries

Affirms **NSF has an important role to play in securing our nation’s future**

**NSF partnerships** are deepened by embedding these priorities in the FY 2023 plan
CREATE OPPORTUNITIES EVERYWHERE
FY 2023 Key Program Investments:

Broadening Participation Programs, $1.57B, or +$235.0 million above FY 2022 Plan

Graduate Research Fellowships:
- $325 million to support 2,500 new fellows, +400 above the FY 2022 Plan
- Stipend increase of $3,000 per year for all active fellows

EPSCoR Program:
- $255 million, of which $10 million is directed to co-funding

GRANTED:
- $45 million, of which $10 million is directed to Emerging Research Institutions
FY 2024 President’s Request to Congress

$11.314 Billion

+$1.775 billion

+18.6% above

FY 2023 Enacted
# Emerging Industries Crosscuts

<table>
<thead>
<tr>
<th>NSF Crosscuts (in $ millions) for Emerging Industries</th>
<th>FY 2021 Actuals</th>
<th>FY 2022 Actuals</th>
<th>FY 2023 Estimate</th>
<th>FY 2024 Request</th>
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<tbody>
<tr>
<td>Advanced Manufacturing</td>
<td>$452</td>
<td>$426</td>
<td>$367</td>
<td>$453</td>
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<tr>
<td>Advanced Wireless</td>
<td>$131</td>
<td>$162</td>
<td>$161</td>
<td>$179</td>
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<tr>
<td>Artificial Intelligence</td>
<td>$702</td>
<td>$782</td>
<td>$688</td>
<td>$796</td>
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<tr>
<td>Biotechnology</td>
<td>$336</td>
<td>$370</td>
<td>$401</td>
<td>$470</td>
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<tr>
<td>Microelectronics &amp; Semiconductors</td>
<td>$131</td>
<td>$153</td>
<td>$164</td>
<td>$210</td>
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<tr>
<td>Quantum Information Science</td>
<td>$255</td>
<td>$348</td>
<td>$275</td>
<td>$333</td>
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*Emerging Industries have funding overlap and thus should not be summed.*

# MPS Science Portfolio and Cross-cuts

## Research Infrastructure
- **Design and Development**
- **Quantum Information Science**
- **Advanced Manufacturing**
- **Artificial Intelligence**
- **Bio-technology**

## Emerging Technologies
- **Advanced Wireless/Spectrum**
- **Net-Zero**
- **Clean Energy**
- **Semiconductors**
- **Missing Millions**

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<th>AST</th>
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<td><strong>Semiconductors</strong></td>
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<td><strong>Missing Millions</strong></td>
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Opportunities to Highlight

• Creating Opportunities Everywhere (Geography of Innovation)
  o MPS Partnership Programs
  o ASCEND
  o LEAPS
  o Supplemental opportunities: MPS High, Graduate Students, US Veterans

• Artificial Intelligence (AI)
• Quantum Information Science and Engineering (QISE)
New MPS-Wide Partnership Model for Expanding the Geography Innovation

- Partnerships for Research and Education in Materials (PREM)
- Partnerships in Astronomy and Astrophysics Research and Education (PAARE)
- Partnerships for Research and Education in Chemistry (PREC)
- Partnerships for Research in and Education in Physics (PREP)
- Partnerships for Research Innovation in Mathematical Sciences (PRIMES)
Purpose. To support postdoctoral Fellows who will broaden the participation of underrepresented minorities in MPS fields in the U.S., enabling Fellows to develop as future leaders in science.

Intent: To recognize and support beginning investigators of significant potential
- research experiences that will broaden perspectives, facilitate interdisciplinary interactions, and help broaden participation within MPS fields.
- prepare fellows for their next career stage (e.g., faculty position).

Awards in any scientific area within the purview of the five MPS Divisions.

FY21 - 33 Awards
FY22 - 31 Awards
Ascend EM Cohort Meeting

- February 8-10 at Carnegie Mellon University
- The EM mentoring is in place to help with the two of the three Rs – recruitment, retention, and relationship as well as ensure strong outcomes for their next step after the postdoc.
- While at the workshop, postdoctoral fellows networked, outlined individual development plans for professional goals, and attended NSF leadership talks.
Launching Early-Career Academic Pathways in the Mathematical and Physical Sciences
LEAPS-MPS (NSF 22-604)

Purpose. To help to launch the careers of pre-tenure faculty in MPS fields at U.S. minority-serving institutions (MSIs), predominantly undergraduate institutions (PUIs), and Carnegie Research 2 (R2) universities.

Intent. To initiate viable independent research programs for researchers attempting to launch their research careers in MPS supported fields.

Goal: achieving excellence through diversity and broadening participation to include members from groups underrepresented in the Mathematical and Physical Sciences, including African Americans, Hispanics, Native Americans, Alaska Natives, and Native Hawaiians, and other Pacific Islanders.

FY21 – 45 Awards
FY22 – 58 Awards
LEAPS PI Meeting

- March 16-17 at NSF Headquarters
- The program has an emphasis on supporting pre-tenure scientists primarily at institutions which have historically not received substantial federal funding for research
- LEAPS funding enables the PI to submit a subsequent successful proposal to a traditional, already-existing NSF funding opportunity, such as individual investigator programs, CAREER competitions, etc.
Creating Opportunities Everywhere

**ASCEND**
- 11% PIs from URG across MPS
- 80% ASCEND PIs from URG

**LEAPS**
- 32% LEAPS PIs from URG
- 87% LEAPS Non-R1
- 25% Non-R1 across MPS
Creating Opportunities Everywhere

MPS-High
• High School Student Research Assistantships Funding to Broaden Participation in the Mathematical and Physical Sciences
• Invite requests which foster interest in the pursuit of studies in the Mathematical and Physical Sciences.
• DCL NSF 22-041

AGEP-GRS
• Supplement for a current MPS research awardee for one (additional) Ph.D.
• Improve diversity and retention at the doctoral level within MPS disciplines.
• PIs requesting a supplement must be either at or collaborating with faculty at an institution that has received an EHR AGEP award.
• DCL NSF 20-083

MPS-GRSV
• MPS Graduate Research Supplement for Veterans
• Supplement for a current MPS research awardee for one (additional) Ph.D., as long as the student is a United States (U.S.) veteran
• DCL NSF 20-097
AI Institutes
• NSF-led in partnership with: Dept. of Agriculture, Dept. of Commerce, Dept. of Defense, Dept. of Education, and Dept. of Homeland Security
• 19 institutes funded so far, and more coming soon
• Each award is $20M over 5 years
• Program touches 40 states encompassing more than 120 universities, MSIs and community colleges

Accelerate AI
• Promotes revolutionizing the scientific method
• Reasoning: Artificial Intelligence for pattern discovery and generating scientific hypotheses
• Data and Modeling: Digital twins for real time modeling and accurate forecasting
• Sensing and Analytics: Smart technologies for real time data collection and aggregation
• Verifying: Formal methods and theorem provers for checking mathematical proofs, hypotheses

ExpandAI
• Promotes capacity development for new AI programs at MSIs, as well as partnerships between MSIs and AI Institutes
• Collaboration across NSF and with USDA, NIST, DHS, and DOD
• Capacity Building grants for planning and growth to establish AI activities
• Partnership grants to scale up established AI activities in collaboration with AI Institutes

NSF 23-506
March 14, 2023 - June 26, 2023
June 27, 2023 - October 20, 2023
QCLI

- Support large-scale projects driven by a cross-disciplinary challenge research theme at the frontier of quantum information science and engineering
- Maintain a timely and bold research agenda aimed at making breakthroughs on compelling challenges in a 5-year period
- Enable the development of a well-trained workforce with strong cross-disciplinary skill sets

Q-AWS

- Enabling Quantum Computing Platform Access for National Science Foundation Researchers with Amazon Web Services, IBM, and Microsoft Quantum
- coordinating the availability of cloud-based access to quantum-computing platforms in order to advance research and build capacity in the academic setting

ExpandQISE

- Aims to increase nation's research capacity and broaden participation in QISE
- **Track 1 Funding:** Institutions with minimal current focus on research (Up to $800,000 per award; up to three years)
- **Track 2 Funding:** Institutions with strong research activity, but no substantial investment in QISE (Up to $5M per award; up to five years)
# MPS Events of Interest

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Date</th>
<th>Details</th>
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<tbody>
<tr>
<td>Spring MPSAC Meeting</td>
<td>Apr 19-20th</td>
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<tr>
<td>Fall MPSAC Meeting</td>
<td>Nov 8-9th</td>
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<td>COV - Division of Astronomical Sciences</td>
<td>Aug 10-11th</td>
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<tr>
<td>COV - Division of Materials Research</td>
<td>Sept 13-15th</td>
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<tr>
<td>2023 MPS Workshop for New Investigators</td>
<td>June 4-6th</td>
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Agenda Highlights

Day 1
- Science Highlight – Artificial Intelligence
- PHY COV Report presentation and approval
- Research Security
- Budget Update and Drivers

Day 2
- Science Highlight – DMREF
- MPS Facilities and AC Subcommittees
- AC ERE
- Partnerships Programs PI and teams
- CEOSE and EPSCoR Update
- Meet with COO and Chief of Staff
Thank You!

Questions?
sljones@nsf.gov